



**The Lowry Academy**  
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# Knowledge Organiser



**2026-27**

**Year 7**



Aspiration | Respect | Confidence | Creativity | Resilience



**YEAR 7**

# ENGLISH



## HT1 | WRITING

Key Terms & Definitions  
Questions

## HT2 | READING WOWC

Key Terms & Definitions  
Questions

## HT3 | WRITING

Key Terms & Definitions  
Questions

## HT4 | READING - WAR & CONFLICT

Key Terms & Definitions  
Questions

## HT5 | WRITING

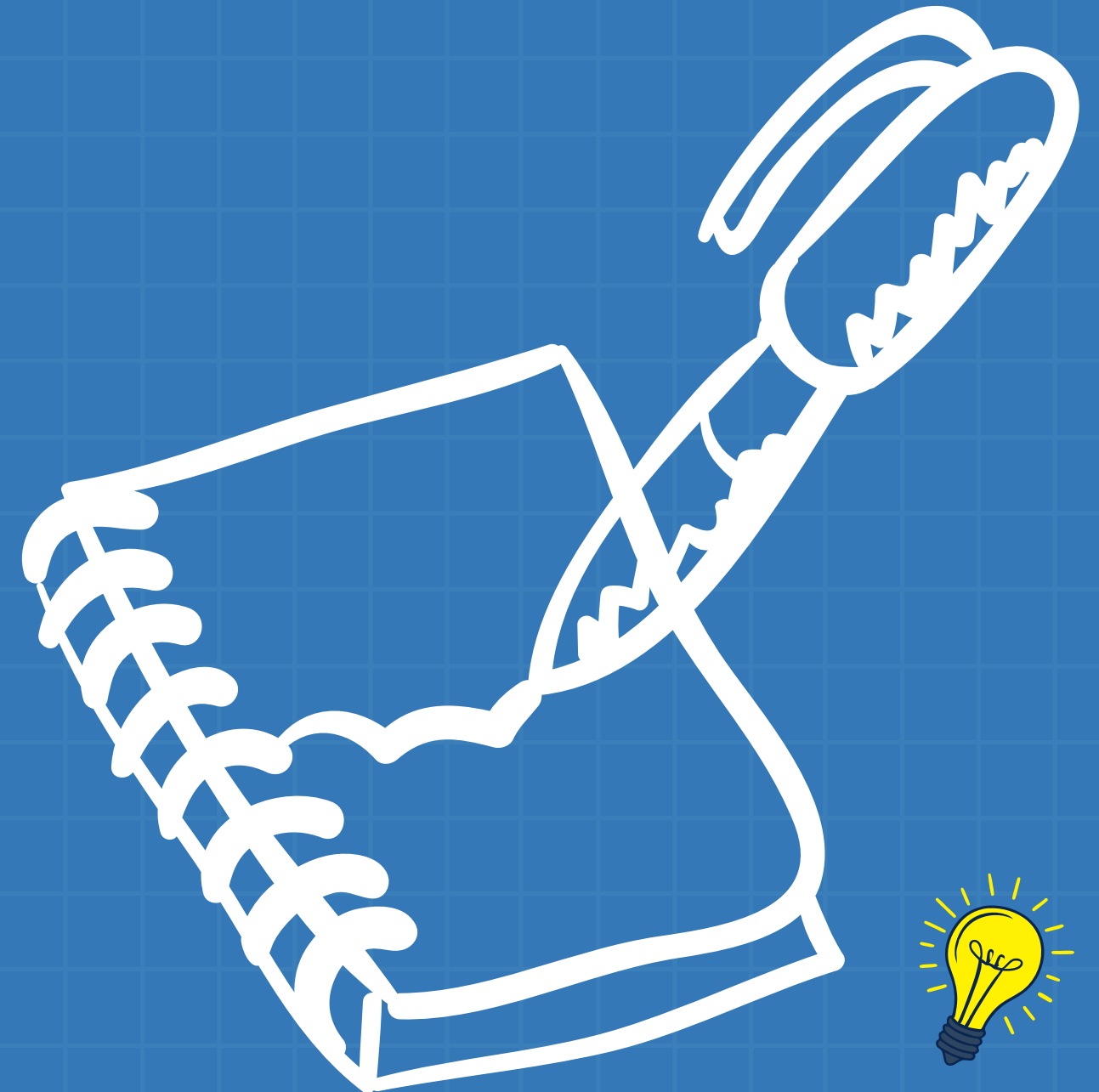
Key Terms & Definitions  
Questions

## HT6 | READING - ROMEO AND JULIET

Key Terms & Definitions  
Questions

## HT6 | READING - WAR AND CONFLICT WITH ANNE FRANK

Key Terms & Definitions  
Questions



| Key Term                  | Definition                                                                                                                                                                                                                                                                             |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Metaphor                  | A metaphor is a figure of speech where something is described as if it is something else, even though it's not literally that thing. They use "was", "is", or "are" to make the comparison direct and powerful. Example: <b>The wind was an icy dagger slicing through the valley.</b> |
| Simile                    | A simile is a figure of speech that compares two different things using the words "like" or "as." Example: <b>The wind was like an icy dagger slicing through the valley.</b>                                                                                                          |
| Noun                      | A noun is a word that names a person, place, thing, or idea.                                                                                                                                                                                                                           |
| Adjective                 | An adjective is a word that describes or modifies a noun or pronoun. It gives more information about the noun's qualities.                                                                                                                                                             |
| Verb                      | A verb is a word that expresses an action, occurrence, or state of being.                                                                                                                                                                                                              |
| Adverb                    | An adverb is a word that modifies a verb, adjective, or another adverb.                                                                                                                                                                                                                |
| Preposition               | A preposition is a word that shows the relationship between a noun (or pronoun) and another word in the sentence. It often tells us where, when, or how something happens.                                                                                                             |
| Coordinating Conjunctions | A coordinating conjunction is a short word that joins two parts of a sentence together. These parts are usually equal, like two full ideas or two things in a list. <b>E.g. For – and – nor - but – or – yet – so</b>                                                                  |
| Implicit Characterisation | This is when the author tells the reader directly what a character is like. Example: <b>Sarah was brave and determined.</b>                                                                                                                                                            |

| Key Term                  | Definition                                                                                                                                                                                                  |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explicit Characterisation | This is when the author shows the character's traits through their: Speech, thoughts, effects on others, actions or looks. Example: <b>Sarah stepped into the blizzard without hesitation, her jaw set.</b> |
| Simple sentences          | A sentence with one independent clause. It needs one subject, one verb and it needs to be a complete thought. Example: <b>The snow fell quietly.</b>                                                        |
| Compound sentences        | A sentence with two or more independent clauses, joined by a coordinating conjunction (like and, but, or, so). Example: <b>The snow fell quietly, and the wind howled through the trees.</b>                |
| Complex sentences         | A sentence with one independent clause and at least one dependent clause (a clause that cannot stand alone). Example: <b>The snow fell quietly while the wind howled through the trees.</b>                 |



Questions

1. What is the key difference between a simile and a metaphor?
2. Is this an example of a metaphor or a simile? **The rain fell like shards of glass.**
3. Is this an example of a metaphor or a simile? **Like a raging bull, the wounded fighter charged at his opponent.**
4. Is this an example of a metaphor or a simile? **The sun was a watchful eye.**
5. What is an adjective?
6. What is a noun?
7. What is a verb?
8. What is an adverb?
9. Which of the word classes is the following word? **Sky.**
10. Which of the word classes is the following word? **Whistled**
11. List the nouns in the picture.

Questions

1. Which adjectives would be appropriate to describe the house in the image?  
**Beautiful – Warm – Eerie - Bright – Empty – Dark**
2. Why is the following simile unsuccessful as a description of the house?  
**The majestic house was as warm and welcoming as a loving hug.**
3. Why is the following metaphor successful as a description of the house?  
**The ominous house was as cold and empty as a shadow.**
4. List the nouns in the picture.
5. Which adjectives would be appropriate to describe the woodland in the image?  
**Beautiful – Warm – Creepy – Peaceful – Bright - Shadowy**
6. Why is the following simile unsuccessful as a description of the woodland?  
**The woodland was as deadly as a raging storm.**
7. Why is the following metaphor successful as a description of the house?  
**The woodland was a paradise, untouched by humans.**
8. What is the difference between implicit and explicit characterisation?
9. Is the following sentence an example of implicit or explicit characterisation?  
**She was a brave soldier.**
10. Is the following sentence an example of implicit or explicit characterisation?  
**He was scared in the dark.**



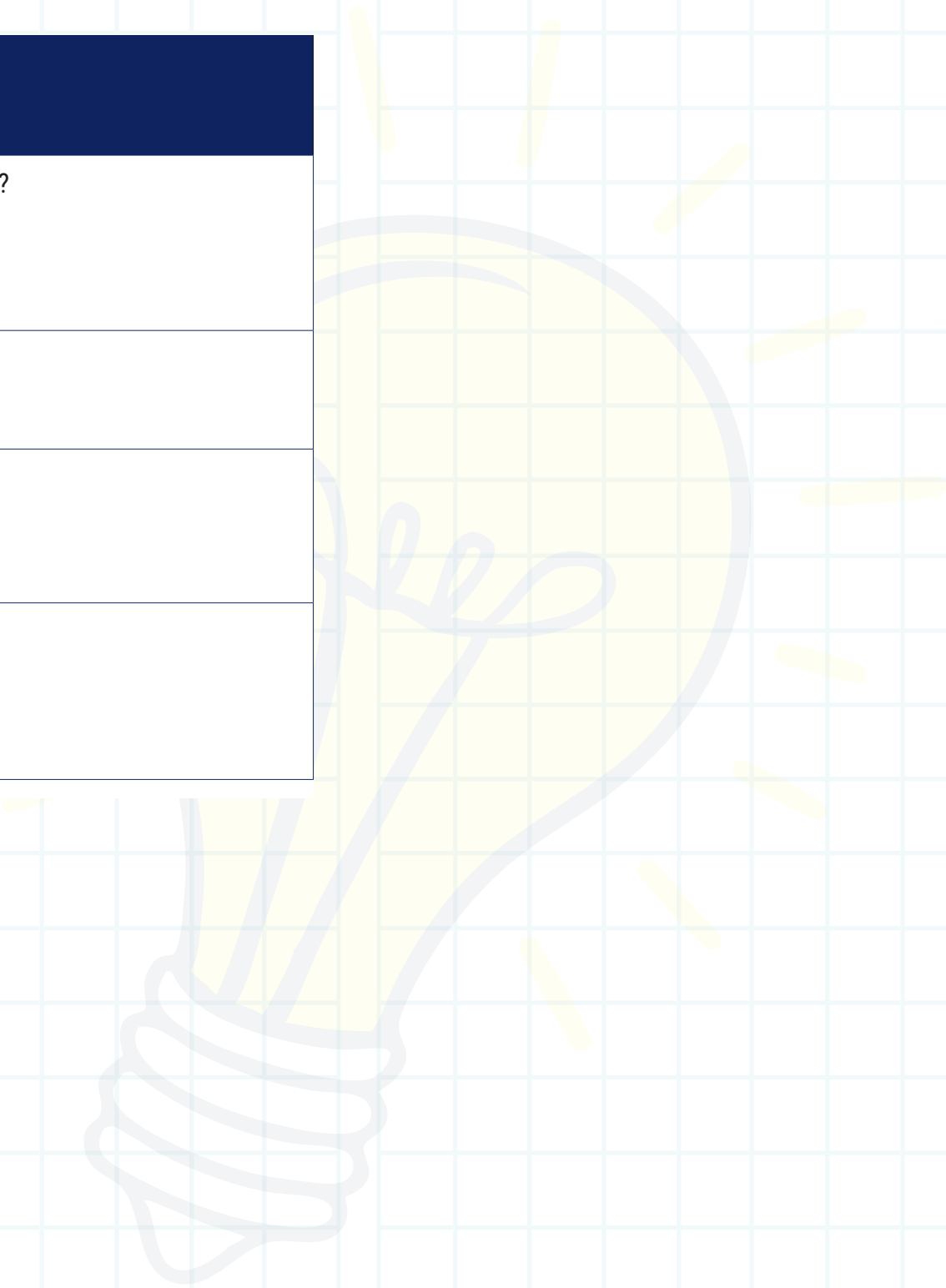
Questions

11. Is the following sentence an example of implicit or explicit characterisation?  
**Her face grew bright red as laughter exploded around her.**

12. What does a simple sentence need?

13. What does a compound sentence join together?

14. What is a complex sentence?



| Key Term         | Definition                                                                                                                                                                                                            |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subversive       | Something or someone that seeks to challenge or overthrow established systems, beliefs, or institutions.                                                                                                              |
| Resilience       | The ability to recover quickly from difficulties, adapt well to change, and keep going in the face of adversity. It involves mental, emotional, and sometimes physical strength.                                      |
| Patriarchal      | Describes a system or society where men hold most of the power and authority, especially in leadership and decision-making—often leaving women with fewer rights and limited opportunities.                           |
| Expectations     | Beliefs or assumptions about how someone should behave and what they should achieve. Expectations can come from family, school, society, or even ourselves.                                                           |
| Class            | In society, class refers to a group of people who are seen as having a similar social or economic position. These can be roughly broken down into Upper, middle and lower class.                                      |
| Characterisation | The way a writer shows what a character is like. This can include their appearance, actions, speech, thoughts, and how others react to them. A writer uses characterisation as a way of getting their message across. |
| Strength         | Being strong—not just physically, but also mentally or emotionally. It means being able to face challenges, stay calm under pressure, and keep going even when things are difficult.                                  |
| Gender           | Gender refers to the roles, behaviours, activities, and identities that a society considers appropriate for people based on whether they are seen as male, female, or another identity.                               |

| Key Term            | Definition                                                                                                                                                                                                                                                          |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Society             | A society is a group of people who live together in an organised way, sharing laws, traditions, values, and ways of life. Societies can be large (like a country) or small (like a local community), and they shape how people behave and interact with each other. |
| Gender expectations | The ideas and rules that a society has about how people should behave, look, or live based on their gender. These expectations often tell people what is considered “normal” or “appropriate” for boys, girls, men, women, or people of other gender identities     |
| Challenge           | To question, resist, or try to change something - especially a rule, belief, or expectation - because you think it is unfair, wrong, or needs to be improved.                                                                                                       |
| Power               | The ability to control people, situations, or resources, or to make decisions that affect others. Power can come from many places like laws, money, knowledge, or social status.                                                                                    |



An early Victorian poster describing ‘7 ways a girl should behave in polite society’

Questions

1. A subversive character in a novel, would seek to \_\_\_\_\_ and \_\_\_\_\_ established systems or institutions.
2. Resilience involves m\_\_\_\_\_, e\_\_\_\_\_, and sometimes p\_\_\_\_\_ strength.
3. A resilient person would keep going in the face of a \_\_\_\_\_.
4. What does a patriarchal society mean for the women in that society?
- 
1. Where can expectations come from?
2. Expectations are beliefs or assumptions about how someone should b\_\_\_\_\_.
3. What are the three main classes in society?
4. What does a writer use characterisation for?
5. Apart from physical strength, what other kinds of strength are there?

Questions

1. According to the poster, how should a girl speak?
2. According to the poster, what shouldn't a girl show?
3. According to the poster, who should a girl obey?
4. According to the poster, what should a girl learn to do and why?
5. What time-period are these expectations based on?
- 
1. Who or what decides what is considered appropriate for people based on whether they are seen as male or female?
2. What does a society shape?
3. Gender expectations are
4. To challenge something is to q \_\_\_\_\_ it, r \_\_\_\_\_ or try to c \_\_\_\_\_ it.
5. Power gives people the ability to make d\_\_\_\_\_ that affect others.
6. Look back at the poster. Did girls or women have power in the Victorian period? Explain your reasoning.

| Key Term            | Definition                                                                                                                                                                        |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Direct Address      | Direct address is when you directly speak to or write to someone, either by name, pronoun (“you”), or other terms of address, to get their attention or to communicate with them. |
| Rhetorical Question | A rhetorical question is asked in order to create a dramatic effect or to make a point rather than to get an answer.                                                              |
| Anecdote            | An anecdote is a short amusing or interesting story about a real incident or person.                                                                                              |
| Emotive Language    | Emotive language refers to words and phrases deliberately chosen to evoke a strong emotional response in the reader or listener.                                                  |
| Facts               | A fact is a thing that is known or proved to be true.                                                                                                                             |
| Statistics          | Statistics is the science of collecting, analysing, interpreting, and presenting data.                                                                                            |
| Expert Opinion      | Expert opinion, in a general sense, refers to a judgment or view on a subject from a person considered knowledgeable or skilled in that area.                                     |
| Imagery             | Imagery refers to the use of descriptive language that is used to create vivid mental pictures and sensory experiences for the reader.                                            |
| Form                | The style in which a text is written.                                                                                                                                             |
| Purpose             | What the writer intends to achieve.                                                                                                                                               |

| Key Term | Definition                                                                                                                     |
|----------|--------------------------------------------------------------------------------------------------------------------------------|
| Audience | The intended readers which could be: an age group, for example, teenagers or adults.                                           |
| Formal   | Formal writing is written for an audience you do not know on a personal level. It is often the main style in academic writing. |
| Informal | Informal consists of short sentences and is used in more personal settings, such as writing a letter to a friend or a diary.   |
| Tone     | In writing, tone refers to the attitude or feeling that a writer expresses towards a subject or audience.                      |

Dear Sir/Madam,

How can we stand by and allow so many animals to suffer?

It is heartbreaking to think of the thousands of stray dogs and cats without safe loving homes.

More than 100,000 animals are abandoned in the UK each year. You can make a difference-please, consider adopting a pet or supporting your local shelter today.



Questions

1. Direct address is when you directly speak to or write to someone, either by name, \_\_\_\_\_ (“you”).
2. A rhetorical question is asked in order to create a \_\_\_\_\_ rather than to get an answer or to make a point.
3. Explain in your own words what an anecdote is. Why might a writer choose to include one in their writing?
4. What is the purpose of emotive language?  
a) To explain facts clearly  
b) To create confusion  
c) To cause an emotional reaction
5. A \_\_\_\_\_ is something that can be proven true or false.
6. \_\_\_\_\_ are numbers that show information about a group of people or things.
7. A doctor says, “I believe regular exercise is the best way to stay healthy.” What is this an example of?
8. What is ‘imagery’?

Questions

1. Referring to the image, is this letter written in formal language or informal language?
2. What is the rhetorical question asking the audience to consider?
3. Identify the emotive language in the letter. What emotion is being evoked?
4. What fact is being stated in the letter?
5. What type of tone is being created through the letter?
1. Diary entries, speeches and letters are all different \_\_\_\_\_
2. The \_\_\_\_\_ of a text is the reason why it was written, e.g., to inform, persuade, or entertain.
3. When writing a letter to your teacher, your \_\_\_\_\_ is your teacher.
4. A company writes a letter to customers using polite and professional language.  
Is this letter likely to be: Formal or Informal
5. The \_\_\_\_\_ of a text shows the writer’s attitude or feelings, like happy, sad, or angry.

| Key Term       | Definition                                                                                                                                             |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Guilt          | A moral emotion that occurs when a person believes or realizes that they have compromised their own standards of conduct.                              |
| Inner conflict | A psychological struggle within the mind of a character or person, arising from opposing demands or impulses.                                          |
| Futility       | Pointlessness or uselessness.                                                                                                                          |
| Conscience     | A person's moral sense of right and wrong, viewed as acting as a guide to one's behaviour.                                                             |
| Betrayal       | The action of betraying one's country, a group, or a person; treachery.                                                                                |
| Trauma         | A deeply distressing or disturbing experience.                                                                                                         |
| Shell shock    | A term that originated during World War I to describe the type of post-traumatic stress disorder (PTSD) that many soldiers experienced during the war. |
| Torment        | Severe mental or physical suffering.                                                                                                                   |
| Patriotism     | The quality of being patriotic; devotion to and vigorous support for one's country.                                                                    |
| Purpose        | What the writer intends to achieve.                                                                                                                    |

| Key Term   | Definition                                                                                                    |
|------------|---------------------------------------------------------------------------------------------------------------|
| Propaganda | Propaganda is communication that is primarily used to influence or persuade an audience to further an agenda. |
| Refrain    | Uses repetition to place emphasis on a set of words or an idea within a poem.                                 |
| Glorified  | Represented as or appearing more elevated or special than is the case.                                        |



Questions

1. When someone feels bad because they believe they have broken their own moral rules, they are experiencing \_\_\_\_.
2. What is the term for a struggle that happens inside a character’s mind when they are pulled in different directions by their thoughts or feelings?
3. Which of these examples best displays the meaning of ‘futility’?  
A) A soldier keeps rebuilding a bridge that gets destroyed every night during the war.  
B) A group of peacekeepers successfully stop fighting between two countries.  
C) A medic saves the lives of injured civilians in a war zone.
4. A person’s m\_\_\_\_\_ sense of right and wrong, viewed as acting as a guide to one’s behaviour.
5. When someone turns against their country or friends and helps the enemy, this is called b\_\_\_\_\_.
6. A character in a story has been through a deeply upsetting event that keeps replaying in their mind. Which word best describes what they are experiencing?
7. What term was used during World War 1 for the condition we now call PTSD, experienced by many soldiers?
8. What words does the poster use to make war look glorified or exciting?
9. What images does the poster use to make war look glorified and exciting?

Questions

10. What images does the poster use to show the harsh reality of war for soldiers?
11. Why do you think posters like this would show war as exciting and fun, instead of dangerous and sad?
12. The right side of the poster shows tired, injured soldiers and broken weapons. What does this tell us about the results of war?
13. What types of suffering can torment lead to?
14. Tom feels proud when he sees soldiers from his country helping to protect others during a war. He shows his support by wearing his country’s flag on special days and learning about its history. What is this an example of?
15. A government creates posters saying, “Our country is the strongest and bravest in the world - join the army today!” Which key term does this describe?
16. When a poet repeats the same line at the end of each stanza, they are using a \_\_\_\_\_.
17. What is the term for when something is presented as elevated/more special than it is.

| Key Term | Definition |
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| Key Term | Definition |
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| Key Term        | Definition                                                                                                                                     |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Patriarchy      | A system or society where men hold the power and women are largely excluded from it.                                                           |
| Consent         | Permission for something to happen or agreement to do something.                                                                               |
| Subvert         | Undermine the power and authority of (an established system or institution).                                                                   |
| Elizabethan era | The Elizabethan era refers to the period of English history during the reign of Queen Elizabeth I (1558-1603).                                 |
| Conflict        | A serious disagreement or argument, typically one that has been happening over an extended period of time.                                     |
| Unrequited love | When one person feels love for another but the other person does not return their feelings, or does not realise they feel that way about them. |
| Besotted        | To be infatuated with someone.                                                                                                                 |
| Resolution      | The action of solving a problem or matter.                                                                                                     |
| Epilogue        | A section or speech at the end of a book of play that serves as a comment on or a conclusion to what has happened.                             |

| Key Term      | Definition                                                                          |
|---------------|-------------------------------------------------------------------------------------|
| Juxtaposition | The fact of two things being seen or placed close together with contrasting effect. |
| Manipulate    | To control or influence (a person or situation) in a clever or devious way.         |
| Headstrong    | Energetically wilful and determined.                                                |

### LIFE FOR WOMEN IN THE ELIZABETHAN ERA



|                  |                                                                                        |
|------------------|----------------------------------------------------------------------------------------|
| Limited Rights   | Women could not go to university, and their role in public life was restricted         |
| Inheritance Laws | Normally, daughters did not inherit their father's property                            |
| Marriage         | While many came to love their husbands, women were expected to marry and have children |
| Control by Men   | Women were expected to obey their fathers and husbands                                 |

Questions

1. A patriarchal society is one where \_\_\_\_\_ hold the power and \_\_\_\_\_ are largely excluded from this.
2. When someone gives permission for something they are giving c\_\_\_\_\_.
3. When someone goes against something or undermines the power/authority they are s\_\_\_\_\_ it.
4. The Elizabethan era was a time in English history when \_\_\_\_\_ ruled the country.
5. What does 'unrequited love' mean?  
A) Love that is returned  
B) Love that is not returned  
C) Love between two married people  
D) Love between friends
6. If you are 'besotted' with someone, how do you feel?  
A) Very angry  
B) Extremely fond or in love  
C) Completely bored  
D) A little nervous
7. There was a c\_\_\_\_\_ between two friends because they both had feelings for the same person.
8. What were the inheritance laws regarding daughters in the Elizabethan era?
9. How were women expected to behave in marriage according to the poster?

Questions

10. What was expected of women in terms of obedience during the Elizabethan era?
11. How did women's roles in public life differ from men's during this time?
12. At the end of the story, the main problem is solved during the \_\_\_\_\_.
13. The author added an \_\_\_\_\_ to explain what happened to the characters after the story ended.
14. The author used \_\_\_\_\_ to show how the rich man's house was bright and warm while the poor family's house was dark and cold.
15. If someone manipulates another person, they are:  
A) Helping them kindly  
B) Controlling them in a clever or sneaky way  
C) Ignoring them completely
16. What does it mean to be 'headstrong'?

| Key Term               | Definition                                                                                                             |
|------------------------|------------------------------------------------------------------------------------------------------------------------|
| Conflict               | A serious disagreement or argument, typically an extended one.                                                         |
| Fascism (dictatorship) | A governmental system led by a dictator having complete power, forcibly suppressing opposition and criticism.          |
| Genocide               | An intentional action to destroy an ethnic, national, racial, or religious group.                                      |
| Isolation              | The state of being alone or lonely.                                                                                    |
| Persecution            | The act of treating people in a cruel and unfair way, especially because of their race, religion or political beliefs. |
| Empathy                | The ability to understand and share the feelings of another.                                                           |
| Perspective            | A particular attitude towards or way of regarding something; a point of view.                                          |
| Evacuee                | A person who has been forced to leave their country to escape war.                                                     |
| Compassion             | Sympathetic pity and concern for the sufferings or misfortunes of others.                                              |

| Key Term     | Definition                                                                                                                   |
|--------------|------------------------------------------------------------------------------------------------------------------------------|
| Migration    | The movement of people from one place to another with intentions of settling, permanently or temporarily, at a new location. |
| Marginalised | To treat a person, group or concept as insignificant.                                                                        |
| Tragedy      | An event causing great suffering, destruction, and distress, such as a serious accident, crime, or natural catastrophe.      |





Questions

1. Conflict is a serious d\_\_\_\_\_ or a\_\_\_\_\_, typically an extended one.
2. What is a governmental system called who is led by a ruler who has complete power?
3. What is genocide?  
A) The killing of a large group of people, especially because of their race, religion, or nationality.  
B) A peaceful agreement between two countries.  
C) A type of government ruled by one person.
4. When someone is kept alone and away from others, this is called \_\_\_\_\_.
5. Persecution is the act of treating people in a cruel and unfair way because of their r\_\_\_\_\_ or p\_\_\_\_\_ beliefs.
6. What is the key term which means the ability to understand and share the feelings of someone else?
7. What does the word 'perspective' mean?
8. What are the children in the image carrying with them?
9. What are the children wearing around their necks?

Questions

10. What is happening to the children in this image?
11. How do you think these children felt at this time?
12. What dangers might these children have faced if they had stayed in the city?
13. How do you feel for these children?
14. A person who has been forced to leave their country to escape war is called an \_\_\_\_\_.
15. Which of these is an example of compassion during a time of war?  
A) Ignoring people who have lost their homes.  
B) Helping injured soldiers and civilians.
16. When people move from one country to another because of war or conflict, this is called m\_\_\_\_\_.
17. In a war zone, a group of people with disabilities are unable to get food and medicine because they are often ignored by aid organisations. This group is an example of people who are m\_\_\_\_\_.
18. When many innocent people die in a war, it is called a\_\_\_\_\_.

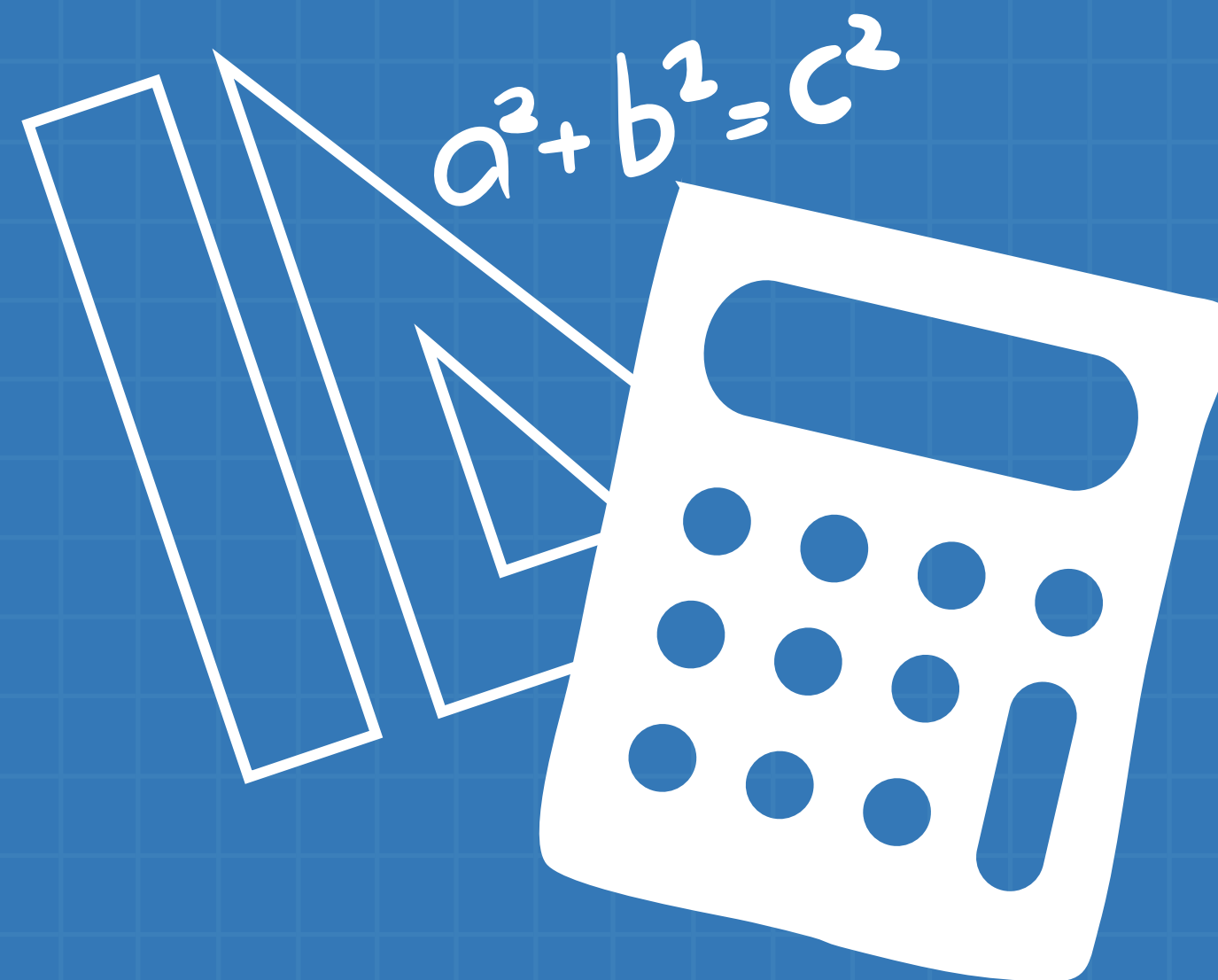


**YEAR 7**

# Maths



- 7.01 | NUMERICAL SKILLS
- 7.02 | ORDER OF OPERATIONS
- 7.03 | INTRODUCTION TO ALGEBRA
- 7.04 | PRIMES, FACTORS AND MULTIPLES
- 7.06 | ADDITION AND SUBTRACTION
- 7.07 | PERIMETER
- 7.09 | MULTIPLICATION AND DIVISION
- 7.11 | FRACTIONS
- 7.15 | POLYGONS
- 7.16 | ANGLES
- 7.17 | COORDINATES
- 7.18 | TIME



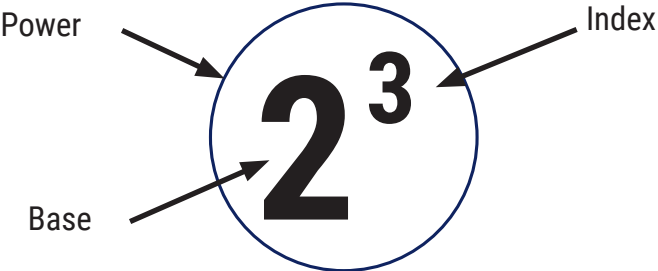


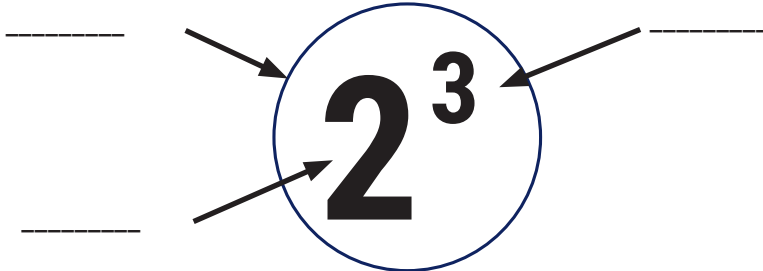
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|----------------------|------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                                                                                                          |
| 1. Place Value       | The value of a digit relating to its position in a number. In 1482 the digits represent 1 thousand, 4 hundreds, 8 tens and 2 ones.       |
| 2. Integer           | Whole numbers including zero. -2, -1, 0, 1, 2, 3, ...                                                                                    |
| 3. Decimal           | A number with a decimal point in it. It can be positive or negative. 0.3, 1.26, -3.4, etc.                                               |
| 4. Positive Number   | Any number above zero: 1, 2, 3, 4, ...                                                                                                   |
| 5. Negative Number   | Any number below zero. Always written with a negative sign in front of it: -1, -2, -3, ...                                               |
| 6. Zero Place Holder | A zero that is used as a place holder to denote the absence of a power of 10<br>E.g. 506 has no tens so there is a 0 in the tens column. |
| 7. Even Number       | Any integer that can be divided by 2 without leaving a remainder. 2, 4, 6, 8, 10, ...                                                    |
| 8. Odd Number        | Any integer that cannot be divided by 2 without leaving a remainder. 1, 3, 5, 7, 9, ...                                                  |
| 9. Square Number     | The result of multiplying a number by itself. It will always be positive: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144...              |

|                         |                                                                                                                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                                                                                                                                                                                                                           |
| 10. Square Root         | The opposite of squaring a number to find the original factor e.g. $\sqrt{9}=3$ or -3                                                                                                                                     |
| 11. Inequality          | When one number, or quantity, is not equal to another.<br>$a < b$ a is less than b<br>$a > b$ a is greater than b<br>$a = b$ a is equal to b<br>$a \neq b$ a is not equal to b                                            |
| 12. Ascending           | Smallest to largest                                                                                                                                                                                                       |
| 13. Descending          | Largest to smallest                                                                                                                                                                                                       |
| 14. Decimal place value | The value of each digit after the decimal point. Tenth, hundredth, thousandth etc.                                                                                                                                        |
| 15. Decimal Places      | The number of digits after the decimal point e.g. 14.278 has 3 decimal places.                                                                                                                                            |
| 16. Estimate            | Find a rough or approximate answer by rounding<br>e.g. $2.3 \times 18.4 \approx 2 \times 20 = 40$<br>$\approx$ "approximately equal to"                                                                                   |
| 17. Rounding            | Nearest 1000    5783.199    = 6000<br>Nearest 100    5783.199    = 5800<br>Nearest 10    5783.199    = 5780<br>Nearest integer    5783.199    = 5783<br>1 d.p.    5783.199    = 5783.2<br>2 d.p.    5783.199    = 5783.20 |

|                      |                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1. Place Value       | The _____ of a _____ relating to its _____ in a number. In 1482 the digits represent 1 thousand, 4 _____, 8 tens and 2 ones.           |
| 2. Integer           | _____ including zero. -2, -1, 0, 1, 2, 3, ...                                                                                          |
| 3. Decimal           | A number with a decimal point in it. It can be positive or negative. 0.3, 1.26, -3.4, etc.                                             |
| 4. Positive Number   | Any number _____: 1, 2, 3, 4, ...                                                                                                      |
| 5. Negative Number   | Any number _____. Always written with a negative sign in front of it: -1, -2, -3, ...                                                  |
| 6. Zero Place Holder | A zero that is used as a place holder to denote the _____ of a power of 10<br>E.g. 506 has no tens so there is a 0 in the tens column. |
| 7. Even Number       | Any _____that can be divided by ____ without leaving a remainder. 2, 4, 6, 8, 10, ...                                                  |
| 8. Odd Number        | Any _____that cannot be divided by ____ without leaving a remainder. 1, 3, 5, 7, 9, ...                                                |
| 9. Square Number     | The result of _____. It will always be _____:<br>1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144...                                     |

|                         |                                                                                                                                                                                        |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10. Square Root         | The opposite of squaring a number to find the original factor e.g.<br>_____                                                                                                            |
| 11. Inequality          | When one number, or quantity, is not equal to another.<br>a < b _____<br>a > b _____<br>a = b _____<br>a ≠ b _____                                                                     |
| 12. Ascending           | _____to _____                                                                                                                                                                          |
| 13. Descending          | _____to _____                                                                                                                                                                          |
| 14. Decimal place value | The value of each digit _____. Tenth, hundredth, thousandth etc..                                                                                                                      |
| 15. Decimal Places      | The number of digits _____.<br>e.g. 14.278 has 3 decimal places.                                                                                                                       |
| 16. Estimate            | Find a _____<br>e.g. 2.3 x 18.4 ≈ 2 x 20 = 40<br>≈ “approximately equal to”                                                                                                            |
| 17. Rounding            | Nearest 1000    5783.199    =<br>Nearest 100    5783.199    =<br>Nearest 10    5783.199    =<br>Nearest integer    5783.199    =<br>1 d.p.    5783.199    =<br>2 d.p.    5783.199    = |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Operation           | A rule for combining numbers + - x ÷                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2. Evaluate            | To work out the value of.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3. Index Notation      | <p>The index tells us how many times the base is being multiplied by itself. The plural of index is indices.</p> <div><p>Power</p><p>Base</p><p>Index</p></div>                                                                                                                                                                                                   |
| 4. Order of Operations | <p>B = Brackets<br/>I = Indices and Roots<br/>DM = Division and Multiplication<br/>AS = Addition and Subtraction</p> <p>If we have a calculation with addition or subtraction only then we calculate from left to right.<br/>18 - 10 + 2<br/><b>8</b> + 2<br/>10</p> <p>If we have a calculation with multiplication or division only then go from left to right<br/>8 x 5 ÷ 4 x 10<br/><b>8 x 5</b> ÷ 4 x 10<br/>40 ÷ 4 x 10<br/>10 x 10 = 100</p> |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Operation           | A rule for _____ numbers + - x ÷                                                                                                                                                                                                                                                                                                                                                                                |
| 2. Evaluate            | To work out the _____ of.                                                                                                                                                                                                                                                                                                                                                                                       |
| 3. Index Notation      | <p>The index tells us how many times the _____ is being multiplied by itself. The plural of index is _____</p> <div></div>                                                                                                                                                                                                   |
| 4. Order of Operations | <p>B = B_____<br/>I = I_____ and R_____<br/>DM = D_____ and M_____<br/>AS = A_____ and S_____</p> <p>If we have a calculation with addition or subtraction only then we calculate from _____<br/>18 - 10 + 2<br/><b>8</b> + 2<br/>10</p> <p>If we have a calculation with multiplication or division only then go from _____<br/>8 x 5 ÷ 4 x 10<br/><b>8 x 5</b> ÷ 4 x 10<br/>40 ÷ 4 x 10<br/>10 x 10 = 100</p> |

|                            |                       |
|----------------------------|-----------------------|
| 1. $2a$                    | $2 \times a$          |
| 2. $ab$                    | $a \times b$          |
| 3. $a^3$                   | $a \times a \times a$ |
| 4. $3a^2$                  | $3 \times a \times a$ |
| 5. $a$ subtracted from $b$ | $b - a$               |
| 6. $a$ less than $b$       | $b - a$               |
| 7. $a$ subtract $b$        | $a - b$               |
| 8. $a$ reduced by $b$      | $a - b$               |
| 9. $a$ divided by $b$      | $\frac{a}{b}$         |
| 10. $b$ divided by $a$     | $\frac{b}{a}$         |

|                              |                                                                                                                                                                                                      |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11. 4 times smaller than $a$ | $\frac{a}{4}$                                                                                                                                                                                        |
| 12. 4 times larger than $a$  | $4 \times a \longrightarrow 4a$                                                                                                                                                                      |
| 13. 5th power of $a$         | $a^5$                                                                                                                                                                                                |
| 14. Variable                 | A letter used to represent any number.                                                                                                                                                               |
| 15. Coefficient              | The number to the left of the variable. This is the value that we multiply the variable by.<br>$4x \longrightarrow$ The coefficient of $x$ is 4.<br>$x \longrightarrow$ The coefficient of $x$ is 1. |
| 16. Term                     | A single number, variable or numbers and variables multiplied together.                                                                                                                              |
| 17. Expression               | A mathematical statement which contains one or more terms combined with addition and/or subtraction signs. E.g. $4x + 3y$ .                                                                          |
| 18. Collecting like terms    | Combining the like terms in an expression.<br>$7x + 3y - 2x$ is simplified to $5x + 3y$ .                                                                                                            |
| 19. Substitute               | Replace a variable with a given value. E.g. if $b = 10$ ,<br>$2b = 2 \times 10 = 20$ $b - 2 = 10 - 2 = 8$                                                                                            |
| 20. Rearrange                | Alter the position of variables using the 4 operations.<br>$5 = \frac{a}{t}$ $t = \frac{a}{5}$ $a = 5 \times t$                                                                                      |

| 1. $2a$                    |  |
|----------------------------|--|
| 2. $ab$                    |  |
| 3. $a^3$                   |  |
| 4. $3a^2$                  |  |
| 5. $a$ subtracted from $b$ |  |
| 6. $a$ less than $b$       |  |
| 7. $a$ subtract $b$        |  |
| 8. $a$ reduced by $b$      |  |
| 9. $a$ divided by $b$      |  |
| 10. $b$ divided by $a$     |  |

| 11. 4 times smaller than $a$ |                                                                                                                                                                                      |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12. 4 times larger than $a$  |                                                                                                                                                                                      |
| 13. 5th power of $a$         |                                                                                                                                                                                      |
| 14. Variable                 | A _____ used to represent any _____.                                                                                                                                                 |
| 15. Coefficient              | The _____ to the left of the variable. This is the value that we _____ the variable by.<br>$4x \longrightarrow$ The _____ of $x$ is 4.<br>$x \longrightarrow$ The _____ of $x$ is 1. |
| 16. Term                     | A single _____, _____ or _____ and _____ multiplied together.                                                                                                                        |
| 17. Expression               | A mathematical statement which contains one or more _____ combined with _____ and/or _____ signs. E.g. $4x + 3y$ .                                                                   |
| 18. Collecting like terms    | _____ the like terms in an expression.<br>$7x + 3y - 2x$ is simplified to $5x + 3y$ .                                                                                                |
| 19. Substitute               | Replace a _____ with a given _____. E.g. if $b = 10$ ,<br>$2b = 2 \times 10 = 20$ $b - 2 = 10 - 2 = 8$                                                                               |
| 20. Rearrange                | Alter the _____ of variables using the 4 operations.<br>$5 = \frac{a}{t}$ $t = \frac{a}{5}$ $a = 5 \times t$                                                                         |



|                                 |                                                                                                                                                                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Factor                       | Any whole number that divides exactly into another number leaving no remainder is a factor.<br>Factors of 20 are: 1, 2, 4, 5, 10, 20                                                                                                                                                       |
| 2. Multiple                     | The result of multiplying a number with a whole number (all times tables!).<br>The multiples of 7:<br>7, 14, 21, 28, 35, 42, 49, 56, 63, 70 ..                                                                                                                                             |
| 3. Highest Common Factor (HCF)  | The HCF of 2 or more numbers is the largest number that is a factor of each of those numbers.<br>E.g. HCF of 18 and 45 = 9<br>18: 1, 2, 3, 6, 9, 18<br>45: 1, 3, 5, 9, 15, 45                                                                                                              |
| 4. Lowest Common Multiple (LCM) | The LCM of 2 or more numbers is the smallest number that is a multiple of each of those numbers.<br>E.g. LCM of 6 and 8 = 24<br>6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60<br>8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80                                                                       |
| 5. Prime Numbers                | A prime number only has two distinct factors: 1 and itself.<br>2 is the only even prime number. 1 is not a prime number.<br>Prime numbers between 1 and 100 are:<br>2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97                         |
| 6. Venn Diagrams                | These were created by an English Mathematician, John Venn (1834 – 1923).<br>They are used to sort groups of data and consist of two or more circles, often overlapping, contained inside a rectangle.<br><div><div><div>T</div><div>F</div></div><div><div>A</div><div>B</div></div></div> |

|                           |                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7. One Intersection       | In a Venn diagram with 2 circles, an overlap represents a section where <b>elements</b> (E.g. numbers) lie in <b>both sets</b> (E.g. A and B). The overlap between the sets, is called the intersection.<br>E.g.<br>A = First ten square numbers B = First ten multiples of 8<br><div><div>16 and 64 are in the intersection as they are in both sets.</div><div><div>A</div><div>B</div></div></div> |
| 8. Multiple Intersections | If a Venn diagram is representing three sets, it will have three circles. Each circle will often overlap with another data set twice, with all three circles overlapping at the centre.<br><div><div><div>A</div><div>B</div></div><div><div>A</div><div>B</div></div></div>                                                                                                                          |

|              |                                                                                             |
|--------------|---------------------------------------------------------------------------------------------|
| 1. Expand    | Multiply out the bracket(s) in the expression.<br>E.g. $3(5x + 7) = 15x + 21$               |
| 2. Factorise | Identify the HCF and rewrite the expression with brackets.<br>E.g. $6x^2 + 9x = 3x(2x + 3)$ |

|                                 |                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Factor                       | Any whole number that _____ exactly into another number leaving no remainder is a factor.<br>Factors of 20 are: 1, 2, 4, 5, 10, 20                                                                                                                                   |
| 2. Multiple                     | The result of _____ a number with a whole number (all times tables!).<br>The multiples of 7:<br>7, 14, 21, 28, 35, 42, 49, 56, 63, 70 ..                                                                                                                             |
| 3. Highest Common Factor (HCF)  | The HCF of 2 or more numbers is the _____ number that is a _____ of each of those numbers.<br>E.g. HCF of 18 and 45 = 9<br>18: 1, 2, 3, 6, 9, 18<br>45: 1, 3, 5, 9, 15, 45                                                                                           |
| 4. Lowest Common Multiple (LCM) | The LCM of 2 or more numbers is the _____ number that is a _____ of each of those numbers.<br>E.g. LCM of 6 and 8 = 24<br>6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60<br>8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80                                                       |
| 5. Prime Numbers                | A prime number only has _____: 1 and itself.<br>2 is the only _____ prime number. 1 is not a prime number. Prime numbers between 1 and 100 are:<br>2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97                    |
| 6. Venn Diagrams                | These were created by an English Mathematician, John Venn (1834 – 1923).<br>They are used to sort groups of data and consist of two or more circles, often overlapping, contained inside a rectangle.<br><div><div>T<div></div>F</div><div>A<div></div>B</div></div> |

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7. One Intersection       | In a Venn diagram with 2 circles, an overlap represents a section where <b>elements</b> (E.g. numbers) lie in <b>both sets</b> (E.g. A and B). The overlap between the sets, is called the _____.<br>E.g.<br>A = First ten square numbers B = First ten multiples of 8<br><br><b>16 and 64</b> are in the intersection as they are in both sets.<br><div><div>A<div><div>9</div><div>1</div><div>36</div><div>49</div><div>81</div><div>25</div><div>100</div></div><div><div>4</div><div>64</div><div>16</div></div><div>B<div><div>8</div><div>72</div><div>48</div><div>80</div><div>24</div><div>32</div><div>56</div><div>40</div></div></div></div></div> |
| 8. Multiple Intersections | If a Venn diagram is representing three sets, it will have three circles. Each circle will often overlap with another data set twice, with all three circles overlapping at the _____.<br><div><div>A<div></div>B</div><div>A<div></div>B</div></div>                                                                                                                                                                                                                                                                                                                                                                                                           |

|              |                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------|
| 1. Expand    | _____ out the bracket(s) in the expression.<br>E.g. 3 (5x + 7) = 15x + 21                           |
| 2. Factorise | Identify the _____ and rewrite the expression with _____.<br>E.g. 6x <sup>2</sup> + 9x = 3x(2x + 3) |

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|-------|-------|-------|------|---|---|----|--------|---|---|----|-------|----|----|----|
| <b>1. Addition</b><br>Plus, add, sum, more than                | To find the total of two or more numbers.<br>The inverse operation is subtraction.                                                                                                                                                                                                                                                                                                                                                        | <div>1.38<br/>4.90 +<br/>6.28</div>         |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>2. Subtraction</b><br>Subtract, minus, take away, less than | To find the difference between two numbers<br>The inverse operation is addition.                                                                                                                                                                                                                                                                                                                                                          | <div>8 1<br/>4.90<br/>1.38 -<br/>3.52</div> |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>3. Commutative</b>                                          | Addition is commutative – the order of addition does not change the result. Subtraction is not commutative.                                                                                                                                                                                                                                                                                                                               |                                             |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>4. Associative</b>                                          | When you add you can do so regardless of how the numbers are grouped. Subtraction is not associative.                                                                                                                                                                                                                                                                                                                                     |                                             |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>5. Two-way Table</b>                                        | <div><div><table><tr><td></td><td>Child</td><td>Adult</td><td>Total</td></tr><tr><td>Male</td><td>7</td><td>9</td><td>16</td></tr><tr><td>Female</td><td>8</td><td>6</td><td>14</td></tr><tr><td>Total</td><td>15</td><td>15</td><td>30</td></tr></table></div><div><div>The values in a row have a total at the right-hand side of the row.</div><div>The values in a column have a total at the bottom of the column.</div></div></div> |                                             |       | Child | Adult | Total | Male | 7 | 9 | 16 | Female | 8 | 6 | 14 | Total | 15 | 15 | 30 |
|                                                                | Child                                                                                                                                                                                                                                                                                                                                                                                                                                     | Adult                                       | Total |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| Male                                                           | 7                                                                                                                                                                                                                                                                                                                                                                                                                                         | 9                                           | 16    |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| Female                                                         | 8                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6                                           | 14    |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| Total                                                          | 15                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15                                          | 30    |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |

|                     |                                                                                                                                                                                                                                                 |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                                                                 |
| <b>1. Perimeter</b> | <p>The total distance around the outside of a closed shape.</p> <div><div>8cm</div><div>5cm</div><div></div></div> <p>Perimeter = 5 + 8 + 5 + 8 = 26 cm</p> |

|                             |                                                                               |
|-----------------------------|-------------------------------------------------------------------------------|
| <b>2. Polygon</b>           | A 2D shape which has 3 or more straight sides.                                |
| <b>3. Regular Polygon</b>   | A polygon where all sides are equal length, and all angles are of equal size. |
| <b>4. Irregular Polygon</b> | A polygon where all sides are not equal and/or all angles are not equal.      |
| <b>5. Units of Length</b>   | 1 cm = 10mm; 1 m = 100 cm; 1 km = 1000 m                                      |

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Average</b>            | A number expressing the central or typical value in a set of data.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>2. Mean</b>               | <p>The sum of the numbers divided by how many numbers are being averaged.<br/>E.g. Calculate the mean of 14, 6, 18, 2, 3.<br/>1) Add the values: <math>14 + 6 + 18 + 2 + 3 = 43</math><br/>2) Divide by 5<br/>3) Mean is <math>43 \div 5 = 8.6</math></p>                                                                                                                                                                                                                                           |
| <b>3. Reversing the Mean</b> | <p>If we have the mean but one of the data points is missing, we can find the missing value by:<br/>1) Multiplying the 'mean' by the number of data points to get the total of the values.<br/>2) Subtracting the sum of the known values from the total of all values.</p> <p>E.g. The mean of three numbers is 5. Two of the numbers are 3 and 10. Find the third value.</p> <p>Total of the values: <math>5 \times 3 = 15</math><br/><math>15 - (3 + 10) = 2</math><br/>The third value is 2</p> |

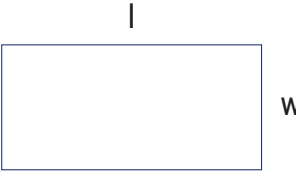
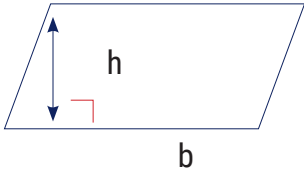
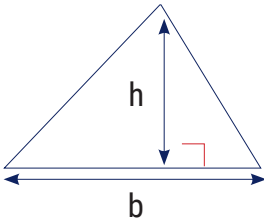
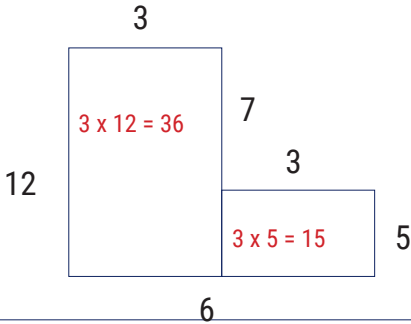
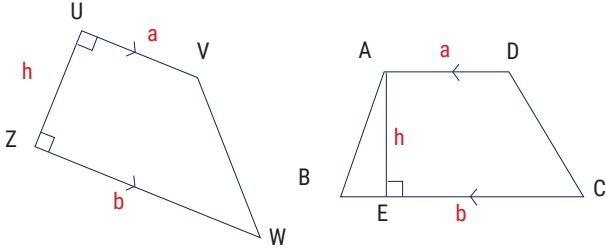
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|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|-------|-------|-------|------|---|---|----|--------|---|---|----|-------|----|----|----|
| <b>1. Addition</b><br>Plus, add, sum, more than                | To find the _____ of two or more numbers.<br>The inverse operation is subtraction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <div>1.38<br/>4.90 +<br/>6.28</div>         |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>2. Subtraction</b><br>Subtract, minus, take away, less than | To find the _____ between two numbers<br>The inverse operation is addition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <div>8 1<br/>4.90<br/>1.38 -<br/>3.52</div> |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>3. Commutative</b>                                          | Addition is _____ – the order of addition does not change the _____. Subtraction is not commutative.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>4. Associative</b>                                          | When you add you can do so regardless of how the numbers are grouped. Subtraction is not associative.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                             |       |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| <b>5. Two-way Table</b>                                        | <div>A visual representation of the possible relationships between two sets of _____ data.<br/>You can add and subtract values _____ and _____ to find totals or missing values.</div> <div><table><tr><td></td><td>Child</td><td>Adult</td><td>Total</td></tr><tr><td>Male</td><td>7</td><td>9</td><td>16</td></tr><tr><td>Female</td><td>8</td><td>6</td><td>14</td></tr><tr><td>Total</td><td>15</td><td>15</td><td>30</td></tr></table><div>The values in a row have a total at the right-hand side of the row.</div><div>The values in a column have a total at the bottom of the column.</div></div> |                                             |       | Child | Adult | Total | Male | 7 | 9 | 16 | Female | 8 | 6 | 14 | Total | 15 | 15 | 30 |
|                                                                | Child                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Adult                                       | Total |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| Male                                                           | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9                                           | 16    |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| Female                                                         | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6                                           | 14    |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |
| Total                                                          | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 15                                          | 30    |       |       |       |      |   |   |    |        |   |   |    |       |    |    |    |

|                     |                                                                                                                                                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                |
| <b>1. Perimeter</b> | <p>The total _____ around the _____ of a closed shape.</p> <div><div>8cm</div><div>5cm</div><div>Perimeter = 5 + 8 + 5 + 8 = 26 cm</div></div> |

|                             |                                                                      |
|-----------------------------|----------------------------------------------------------------------|
| <b>2. Polygon</b>           | A 2D shape which has _____.                                          |
| <b>3. Regular Polygon</b>   | A polygon where all sides are _____, and all angles are of _____.    |
| <b>4. Irregular Polygon</b> | A polygon where all sides are not _____ and/or all angles are _____. |
| <b>5. Units of Length</b>   | 1 cm = ____mm; 1 m = ____ cm; 1 km = ____m                           |

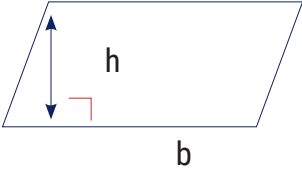
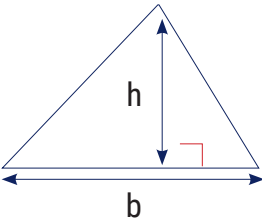
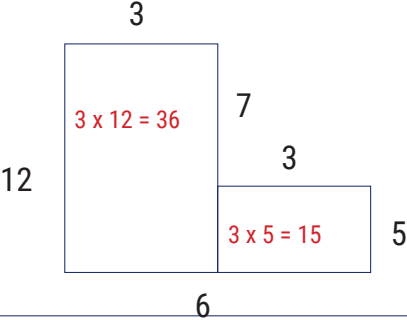
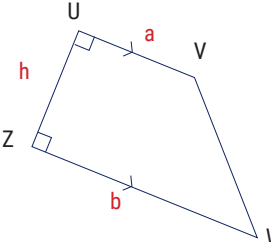
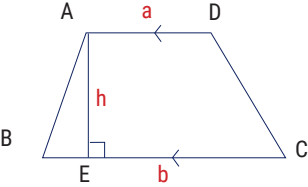
|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>1. Average</b>            | A number expressing the _____ or _____ value in a set of data.                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>2. Mean</b>               | <p>The _____ of the numbers _____ by how many numbers are being averaged.<br/>E.g. Calculate the mean of 14, 6, 18, 2, 3.<br/>1) _____ the values: 14 + 6 + 18 + 2 + 3 = 43<br/>2) _____ by 5<br/>3) Mean is _____ = 8.6</p>                                                                                                                                                                                                                               |
| <b>3. Reversing the Mean</b> | <p>If we have the mean but one of the data points is missing, we can find the missing value by:<br/>1) _____ the 'mean' by the number of data points to get the total of the values.<br/>2) _____ the _____ of the known values from the total of all values.</p> <p>E.g. The mean of three numbers is 5. Two of the numbers are 3 and 10. Find the third value.</p> <p>Total of the values: 5 x 3 = 15<br/>15 – (3 + 10) = 2<br/>The third value is 2</p> |

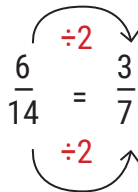
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|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Multiplication</b><br>lots of, times, product, of | Multiplication is the operation of scaling one number by another.<br>Multiplication is the inverse operation of division.<br>Multiplication is commutative – the order of multiplication does not change the result. E.g. $2 \times 3 = 3 \times 2$ .<br>Multiplication is associative – when you multiply you can do so regardless of how the numbers are grouped.<br>E.g. $1 \times (2 \times 3) = (1 \times 2) \times 3$                         |
| <b>2. Multiplying Integers</b>                          | $29 \times 3$<br>$\begin{array}{r} 29 \\ \times 3 \\ \hline 87 \\ \hline 2 \end{array}$                                                                                                                                                                                                                                                                                                                                                             |
| <b>3. Multiplying Decimals</b>                          | Remove the decimal points<br>Multiply<br>$0.5 \times 0.3$<br>$5 \times 3 = 15$<br>$0.5 \times 0.3 = 0.15$<br>Insert the same number of decimal points in the answer as in the question                                                                                                                                                                                                                                                              |
| <b>4. Division</b>                                      | Division can be thought of as sharing.<br>The number being divided is shared equally into the stated number of parts.<br>Division is the inverse operation of multiplication.<br>$D \div \square = \square \mid \overline{D} = \frac{D}{\square}$<br>E.g. $8 \div 9 = 9 \overline{)8} = \frac{8}{9}$ $4524 \div 3 = \begin{array}{r} 1508 \\ 3 \overline{)4524} \end{array}$ $3 \div 8 = \begin{array}{r} 0.375 \\ 8 \overline{)3.000} \end{array}$ |
| <b>5. Dividend</b>                                      | The number being divided.<br>$15 \div 3 \longrightarrow 15$ is the dividend.                                                                                                                                                                                                                                                                                                                                                                        |
| <b>6. Divisor</b>                                       | The number by which another is divided.<br>$15 \div 3 \longrightarrow 3$ is the divisor.                                                                                                                                                                                                                                                                                                                                                            |

|                                 |                                                                                                                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Area</b>                  | A measure of the space inside a 2D shape. Area is measured in square units. E.g. square centimetres (cm <sup>2</sup> ), square metres (m <sup>2</sup> ).                                                                 |
| <b>2. Area of a Rectangle</b>   | Area = length x width<br>                                                                                                             |
| <b>3. Area of Parallelogram</b> | Area = base x height<br>                                                                                                              |
| <b>4. Area of Triangle</b>      | Area = $\frac{\text{base} \times \text{height}}{2}$<br>                                                                              |
| <b>5. Compound Area</b>         | Split into regular shapes<br>Find the area of each<br>Sum the areas<br><br>Area = $36 + 15 = 51 \text{ units}^2$                    |
| <b>6. Units of Area</b>         | 1 cm <sup>2</sup> = 100 mm <sup>2</sup> ; 1 m <sup>2</sup> = 10,000 cm <sup>2</sup>                                                                                                                                      |
| <b>7. Area of Trapezium</b>     | Sum of the parallel sides.<br>Divide by 2.<br>Multiply by the vertical height.<br>$A = \left( \frac{a + b}{2} \right) \times h$<br> |



|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Multiplication</b><br>lots of, times, product, of | Multiplication is the operation of _____ one number by another.<br>Multiplication is the inverse operation of division.<br>Multiplication is _____ – the order of multiplication does not change the result. E.g. $2 \times 3 = 3 \times 2$ .<br>Multiplication is associative – when you multiply you can do so regardless of how the numbers are grouped.<br>E.g. $1 \times (2 \times 3) = (1 \times 2) \times 3$                     |
| <b>2. Multiplying Integers</b>                          | $29 \times 3$<br>$\begin{array}{r} 29 \\ \times 3 \\ \hline 87 \\ 2 \end{array}$                                                                                                                                                                                                                                                                                                                                                        |
| <b>3. Multiplying Decimals</b>                          | Remove the decimal points<br>Multiply<br>$0.5 \times 0.3$<br>$5 \times 3 = 15$<br>$0.5 \times 0.3 = 0.15$<br>Insert the same number of decimal points in the answer as in the question                                                                                                                                                                                                                                                  |
| <b>4. Division</b>                                      | Division can be thought of as _____.<br>The number being divided is shared equally into the stated number of parts.<br>Division is the inverse operation of multiplication.<br>$D \div \square = \square \quad \square \overline{)D}$<br>E.g. $8 \div 9 = 9 \overline{)8} = \frac{8}{9}$ $4524 \div 3 = \begin{array}{r} 1508 \\ 3 \overline{)4524} \end{array}$ $3 \div 8 = \begin{array}{r} 0.375 \\ 8 \overline{)3.000} \end{array}$ |
| <b>5. Dividend</b>                                      | The number being divided.<br>$15 \div 3 \longrightarrow$ _____ is the dividend.                                                                                                                                                                                                                                                                                                                                                         |
| <b>6. Divisor</b>                                       | The number by which another is divided.<br>$15 \div 3 \longrightarrow$ _____ is the divisor.                                                                                                                                                                                                                                                                                                                                            |

|                                 |                                                                                                                                                                                                                                                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Area</b>                  | A _____ inside a 2D shape. Area is measured in _____ units. E.g. square centimetres (cm <sup>2</sup> ), square metres (m <sup>2</sup> ).                                                                                                                                                             |
| <b>2. Area of a Rectangle</b>   | Area = _____<br>                                                                                                                                                                                                  |
| <b>3. Area of Parallelogram</b> | Area = _____<br>                                                                                                                                                                                                  |
| <b>4. Area of Triangle</b>      | Area = _____<br>                                                                                                                                                                                                 |
| <b>5. Compound Area</b>         | Split into regular shapes<br>Find the area of each<br>Sum the areas<br><br>Area = $36 + 15 = 51 \text{ units}^2$                                                                                                |
| <b>6. Units of Area</b>         | 1 cm <sup>2</sup> = 100 mm <sup>2</sup> ; 1 m <sup>2</sup> = 10,000 cm <sup>2</sup>                                                                                                                                                                                                                  |
| <b>7. Area of Trapezium</b>     | Sum of the _____ sides.<br>Divide by 2.<br>Multiply by the _____.<br>$A = \left( \frac{a + b}{2} \right) \times h$<br><br> |

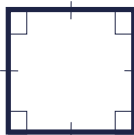
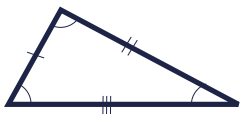
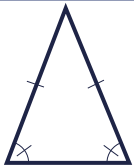
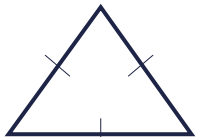
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|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|--------------------------------------------------|----------------------------------------------------|
| 1. Fraction                                     | Part of a whole.<br>The result of dividing one integer by a second (non-zero) integer.<br><b>Numerator</b><br>How many equal parts do you have?<br><b>Denominator</b><br>How many equal parts is the whole divided into?<br>$\frac{11}{8}$                                                                                                                                                                                                                                             |                                                  |                                                    |                                                  |                                                    |
| 2. Proper Fraction                              | The numerator is smaller than the denominator e.g.<br>$\frac{5}{6}$                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                  |                                                    |                                                  |                                                    |
| 3. Improper fraction                            | The numerator is greater than or equal to the denominator e.g.<br>$\frac{11}{8}$                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |                                                    |                                                  |                                                    |
| 4. Mixed number                                 | A whole number combined with a fraction. e.g.<br>$2\frac{1}{3}$                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                  |                                                    |                                                  |                                                    |
| 5. Simplify a fraction                          | Divide both the numerator and the denominator of the fraction by their HCF.<br><div><math>\frac{6}{14} = \frac{3}{7}</math></div>                                                                                                                                                                                                                                                                 |                                                  |                                                    |                                                  |                                                    |
| 6. Writing one number as a fraction of another  | Write £15 as a fraction of £25<br>$\frac{15}{25} = \frac{3}{5}$                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                  |                                                    |                                                  |                                                    |
| 7. Equivalent Fractions                         | Fractions which have the same value.<br>The numerator and the denominator can be multiplied or divided by the same number.<br>E.g. Fractions equivalent to $\frac{3}{5}$ :<br><table><tr><td><math>\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}</math></td><td><math>\frac{3}{5} \times \frac{3}{3} = \frac{9}{15}</math></td><td><math>\frac{3}{5} \times \frac{4}{4} = \frac{12}{20}</math></td><td><math>\frac{3}{5} \times \frac{10}{10} = \frac{30}{50}</math></td></tr></table> | $\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$  | $\frac{3}{5} \times \frac{3}{3} = \frac{9}{15}$    | $\frac{3}{5} \times \frac{4}{4} = \frac{12}{20}$ | $\frac{3}{5} \times \frac{10}{10} = \frac{30}{50}$ |
| $\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$ | $\frac{3}{5} \times \frac{3}{3} = \frac{9}{15}$                                                                                                                                                                                                                                                                                                                                                                                                                                        | $\frac{3}{5} \times \frac{4}{4} = \frac{12}{20}$ | $\frac{3}{5} \times \frac{10}{10} = \frac{30}{50}$ |                                                  |                                                    |

|                                                       |                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8. Convert an integer to a fraction                   | Whole numbers are an integer with a denominator of 1.<br>$\frac{3}{1} = \frac{15}{5}$                                                                                                                                                                                                                                |
| 9. Converting an improper fraction to a mixed number  | Divide the numerator by the denominator.<br>Write down the whole number of the answer and the remainder as the numerator of the fraction.<br>The denominator of the mixed number is the same as the denominator of the improper fraction.<br>$\frac{15}{7} = 2\frac{1}{7}$                                           |
| 10. Converting a mixed number to an improper fraction | Change the whole number into a fraction (same denominator) and add on the fraction part.<br>$2\frac{3}{4} = \frac{8}{4} + \frac{3}{4} = \frac{11}{4}$                                                                                                                                                                |
| 11. Add/Subtract Fractions                            | Make the denominators the same (find the LCM).<br>Use equivalent fractions to change each fraction to the common denominator. Add/subtract the numerators only.<br>$\frac{2}{7} + \frac{2}{5} = \frac{10}{35} + \frac{14}{35} = \frac{24}{35}$                                                                       |
| 12. Order Fractions                                   | Find the lowest common denominator.<br>Write equivalent fractions with the LCD.<br>Order from the smallest to largest numerator. Rewrite original fractions in the new order.<br>$\frac{2}{3}, \frac{5}{6}, \frac{4}{5}$<br>$\frac{20}{30}, \frac{25}{30}, \frac{24}{30}$<br>$\frac{2}{3}, \frac{4}{5}, \frac{5}{6}$ |
| 13. Convert fractions to decimals                     | Use short division.<br>E.g. to convert $\frac{3}{8}$ to a decimal<br>$0.375$<br>$8 \overline{)3.000}$                                                                                                                                                                                                                |
| 14. Fractions of an amount                            | We divide the amount by the denominator and then multiply the result by the numerator.<br>e.g. $\frac{2}{7}$ of 35<br>$35 \div 7 = 5$<br>$2 \times 5 = 10$                                                                                                                                                           |

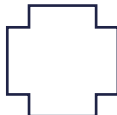
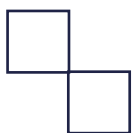
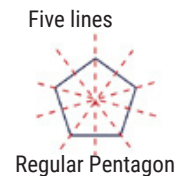
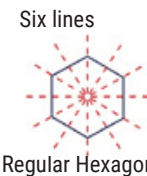
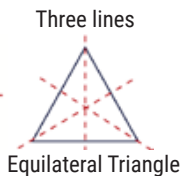
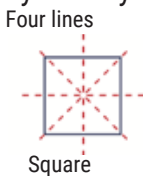
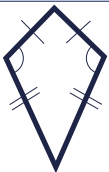
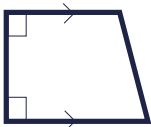
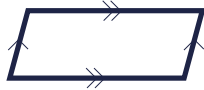
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|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|--------------------------------------------------|----------------------------------------------------|
| 1. Fraction                                     | Part of a _____.<br>The result of dividing one integer by a second (non-zero) integer.<br><div><div><math>\frac{11}{8}</math></div><div>How many equal parts do you have?<br/>How many equal parts is the whole divided into?</div></div>                                                                                                                                                                                                                                         |                                                  |                                                    |                                                  |                                                    |
| 2. Proper Fraction                              | The numerator is _____ than the denominator e.g.<br>$\frac{5}{6}$                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                  |                                                    |                                                  |                                                    |
| 3. Improper fraction                            | The numerator is _____ than or equal to the denominator e.g.<br>$\frac{11}{8}$                                                                                                                                                                                                                                                                                                                                                                                                    |                                                  |                                                    |                                                  |                                                    |
| 4. Mixed number                                 | A whole number _____ . e.g.<br>$2\frac{1}{3}$                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                  |                                                    |                                                  |                                                    |
| 5. Simplify a fraction                          | Divide both the numerator and the denominator of the fraction by _____.<br><div><div><math>\frac{6}{14} = \frac{3}{7}</math></div><div><div>↻<br/>÷2</div><div>↻<br/>÷2</div></div></div>                                                                                                                                                                                                                                                                                         |                                                  |                                                    |                                                  |                                                    |
| 6. Writing one number as a fraction of another  | Write £15 as a fraction of £25<br>$\frac{15}{25} = \frac{3}{5}$                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                  |                                                    |                                                  |                                                    |
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| $\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$ | $\frac{3}{5} \times \frac{3}{3} = \frac{9}{15}$                                                                                                                                                                                                                                                                                                                                                                                                                                   | $\frac{3}{5} \times \frac{4}{4} = \frac{12}{20}$ | $\frac{3}{5} \times \frac{10}{10} = \frac{30}{50}$ |                                                  |                                                    |

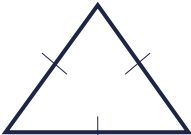
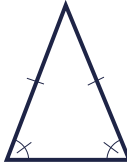
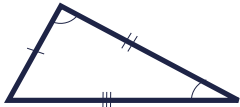
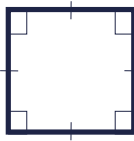
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|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| 9. Converting an improper fraction to a mixed number  | Divide the _____ by the _____.<br>Write down the whole number of the answer and the remainder as the _____ of the fraction.<br>The denominator of the mixed number is the same as the denominator of the improper fraction.<br>$\frac{15}{3} = 2\frac{3}{3}$                                                                                                                                                                      |
| 10. Converting a mixed number to an improper fraction | Change the whole number into a fraction (same denominator) and add on the fraction part.<br>$2\frac{3}{8} = \frac{8}{8} + \frac{3}{8} = \frac{11}{8}$                                                                                                                                                                                                                                                                             |
| 11. Add/Subtract Fractions                            | Make the _____ the same (find the _____).<br>Use _____ fractions to change each fraction to the common denominator. Add/subtract the numerators only.<br>$\frac{2}{3} + \frac{2}{3} = \frac{10}{3} + \frac{14}{3} = \frac{24}{3}$                                                                                                                                                                                                 |
| 12. Order Fractions                                   | Find the _____.<br>Write _____ fractions with the LCD.<br>Order from the smallest to largest numerator. Rewrite original fractions in the new order.<br><div><math>\frac{2}{3}, \frac{5}{6}, \frac{4}{5}</math><br/><math>\frac{20}{20} \text{ ①}, \frac{25}{25} \text{ ③}, \frac{24}{24} \text{ ②}</math><br/><math>\frac{2}{30}, \frac{3}{30}, \frac{5}{30}</math><br/><math>\frac{2}{3}, \frac{4}{5}, \frac{5}{6}</math></div> |
| 13. Convert fractions to decimals                     | Use short division.<br>E.g. to convert $\frac{3}{8}$ to a decimal<br><div><math>0.375</math><br/><math>8 \overline{)3.000}</math></div>                                                                                                                                                                                                                                                                                           |
| 14. Fractions of an amount                            | We divide the amount by the _____ and then multiply the result by the _____.<br>e.g. $\frac{2}{7}$ of 35<br>$35 \div 7 = 5$<br>$2 \times 5 = 10$                                                                                                                                                                                                                                                                                  |

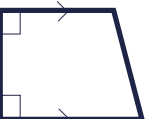
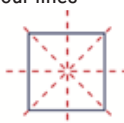
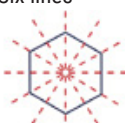
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|---------------------------|-----------------------------------------------------------------------|
| 1. 3 sides                | Triangle                                                              |
| 2. 4 sides                | Quadrilateral                                                         |
| 3. 5 sides                | Pentagon                                                              |
| 4. 6 sides                | Hexagon                                                               |
| 5. 7 sides                | Heptagon                                                              |
| 6. 8 sides                | Octagon                                                               |
| 7. 9 sides                | Nonagon                                                               |
| 8. 10 sides               | Decagon                                                               |
| 9. 11 sides               | Hendecagon                                                            |
| 10. 12 sides              | Dodecagon                                                             |
| 11. Equilateral Triangle  | 3 equal angles<br>3 equal sides                                       |
| 12. Isosceles Triangle    | 2 equal angles<br>2 equal sides                                       |
| 13. Scalene Triangle      | All angles are different<br>All sides are different                   |
| 14. Right-angled Triangle | One angle of 90°<br>Can be isosceles or scalene                       |
| 15. Square                | 4 right angles<br>4 equal sides<br>2 pairs of parallel sides          |
| 16. Rectangle             | 4 right angles<br>2 pairs of parallel sides<br>2 pairs of equal sides |

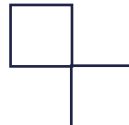


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|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17. Parallelogram          | 2 pairs of equal sized angles<br>2 pairs of parallel sides<br>2 pairs of equal sides                                                                                                                                                                                                                                                                                              |
| 18. Rhombus                | 4 equal sides<br>2 pairs of equal sized angles<br>2 pairs of parallel sides                                                                                                                                                                                                                                                                                                       |
| 19. Trapezium              | 1 pair of parallel sides                                                                                                                                                                                                                                                                                                                                                          |
| 20. Right-angled Trapezium | 2 right angles<br>1 pair of parallel sides                                                                                                                                                                                                                                                                                                                                        |
| 21. Isosceles Trapezium    | 1 pair of parallel sides<br>2 pairs of equal sides<br>2 pairs of equal sized angles                                                                                                                                                                                                                                                                                               |
| 22. Kite                   | 1 pair of equal sized angles<br>2 pairs of equal sides                                                                                                                                                                                                                                                                                                                            |
| 23. Line symmetry          | <p>The mirror lines of a shape. If a polygon is regular, the number of sides is equal to the number of lines of symmetry.</p> <div><div>Four lines<br/><br/>Square</div><div>Three lines<br/><br/>Equilateral Triangle</div><div>Six lines<br/><br/>Regular Hexagon</div><div>Five lines<br/><br/>Regular Pentagon</div></div>                                                    |
| 24. Rotational symmetry    | <p>The number of positions in which the rotated object appears unchanged. The number of positions is called the order of the symmetry. For example, Order 3 tells us that a shape can be rotated into three positions where the shape appears unchanged.</p> <div><div>Order 2</div><div>No rotational symmetry</div><div>Order 3</div><div>Order 4</div><div>Order 5</div></div> |

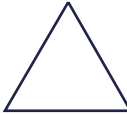


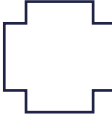
|                           |                                                                    |                                                                                       |
|---------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                           |                                                                    |                                                                                       |
| 1. 3 sides                |                                                                    |                                                                                       |
| 2. 4 sides                |                                                                    |                                                                                       |
| 3. 5 sides                |                                                                    |                                                                                       |
| 4. 6 sides                |                                                                    |                                                                                       |
| 5. 7 sides                |                                                                    |                                                                                       |
| 6. 8 sides                |                                                                    |                                                                                       |
| 7. 9 sides                |                                                                    |                                                                                       |
| 8. 10 sides               |                                                                    |                                                                                       |
| 9. 11 sides               |                                                                    |                                                                                       |
| 10. 12 sides              |                                                                    |                                                                                       |
| 11. Equilateral Triangle  | 3 _____ angles<br>3 _____ sides                                    |  |
| 12. Isosceles Triangle    | 2 _____ angles<br>2 _____ sides                                    |  |
| 13. Scalene Triangle      | All angles are _____<br>All sides are _____                        |  |
| 14. Right-angled Triangle | One angle of _____<br>Can be _____ or _____                        |  |
| 15. Square                | 4 _____ angles<br>4 _____ sides<br>2 pairs of _____ sides          |  |
| 16. Rectangle             | 4 _____ angles<br>2 pairs of _____ sides<br>2 pairs of _____ sides |  |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                       |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 17. Parallelogram          | 2 pairs of _____ sized angles<br>2 pairs of _____ sides<br>2 pairs of _____ sides                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |
| 18. Rhombus                | 4 _____ sides<br>2 pairs of _____ sized angles<br>2 pairs of _____ sides                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |
| 19. Trapezium              | 1 pair of _____ sides                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |
| 20. Right-angled Trapezium | 2 _____ angles<br>1 pair of _____ sides                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |    |
| 21. Isosceles Trapezium    | 1 pair of _____ sides<br>2 pairs of _____ sides<br>2 pairs of _____ sized angles                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |
| 22. Kite                   | 1 pair of _____ sized angles<br>2 pairs of _____ sides                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| 23. Line symmetry          | The _____ lines of a shape. If a polygon is regular, the number of sides is _____ to the number of lines of symmetry.                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                       |
|                            | <div><div>Four lines<br/><br/>Square</div><div>Three lines<br/><br/>Equilateral</div><div>Six lines<br/><br/>Regular</div><div>Five lines<br/><br/>Regular</div></div> |                                                                                       |
| 24. Rotational symmetry    | The number of _____ in which the rotated object appears unchanged. The number of positions is called the _____ . For example, Order 3 tells us that a shape can be rotated into three positions where the shape appears unchanged.                                                                                                                                                                                                                                                                                         |                                                                                       |

Order 2

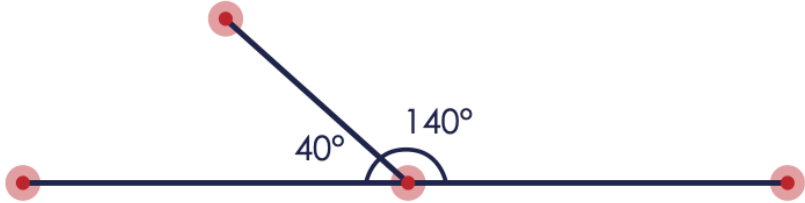
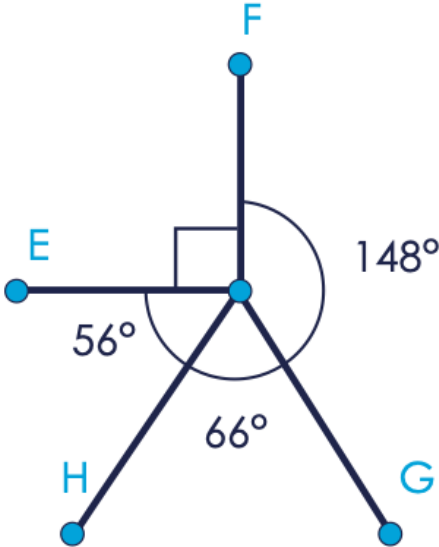
No rotational symmetry

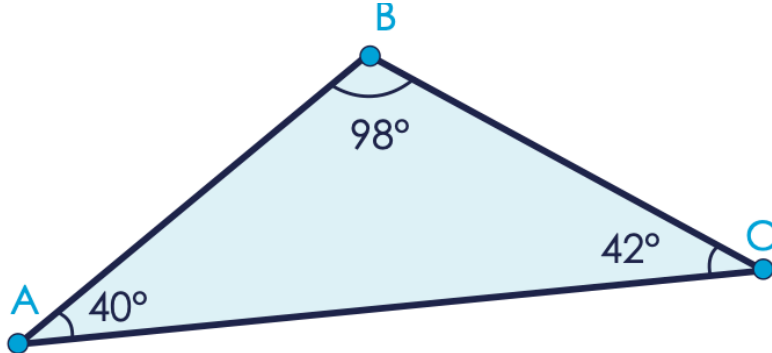
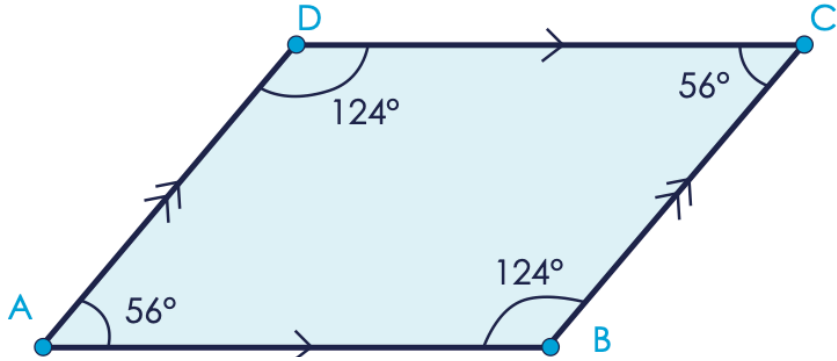
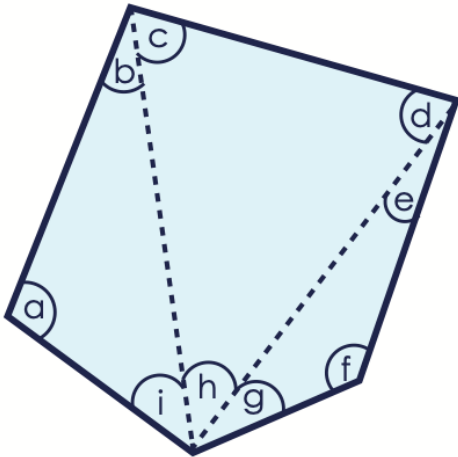
Order 3

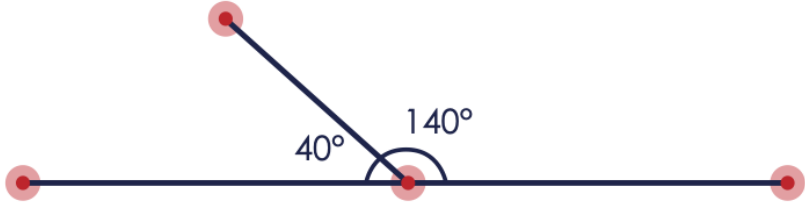
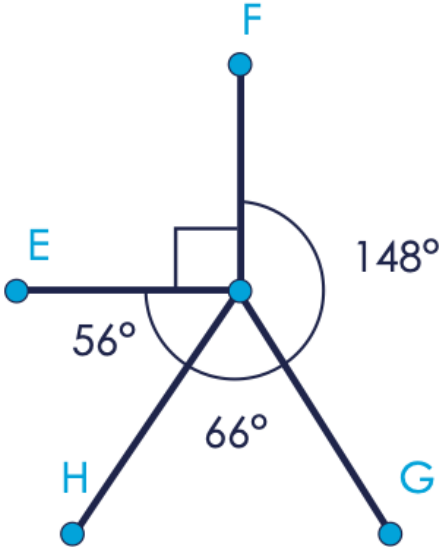
Order 4

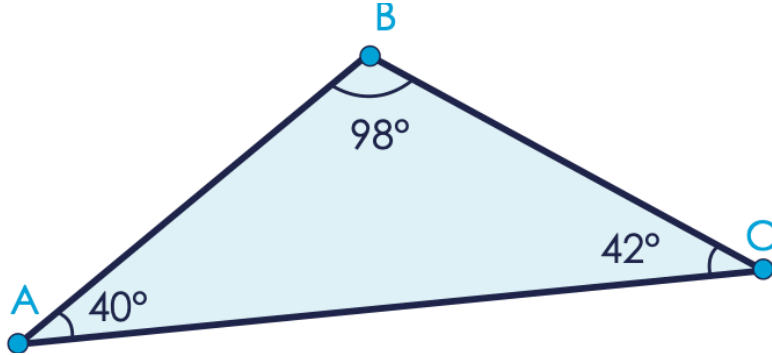
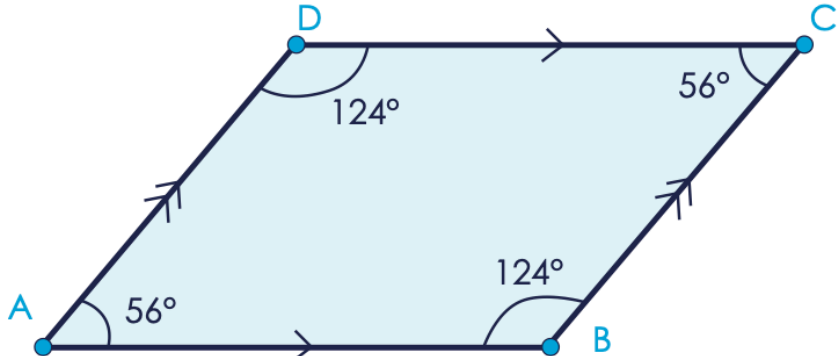
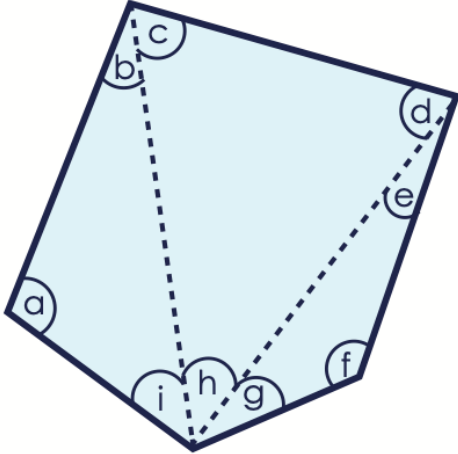
Order 5

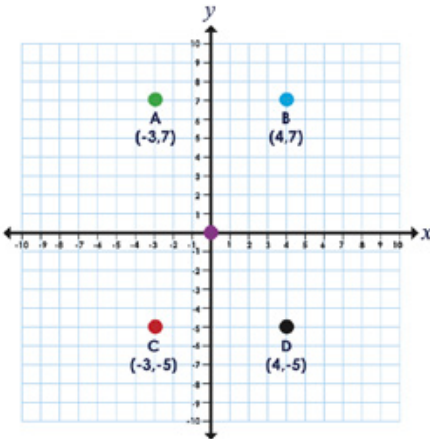


|                              |                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1. Angle                     | An angle is a measure of turn from one line segment to another. One whole turn is equal to 360 degrees.                      |
| 2. Degree                    | The most common unit of measurement for angles.                                                                              |
| 3. Acute Angle               | Less than 90°                                                                                                                |
| 4. Right Angle               | Exactly 90°                                                                                                                  |
| 5. Obfuse Angle              | Greater than 90° but less than 180°                                                                                          |
| 6. Reflex Angle              | Greater than 180°                                                                                                            |
| 7. Angles on a straight line | Angles on a straight line sum to 180°<br> |
| 8. Angles around a point     | Angles around a point sum to 360°<br>    |

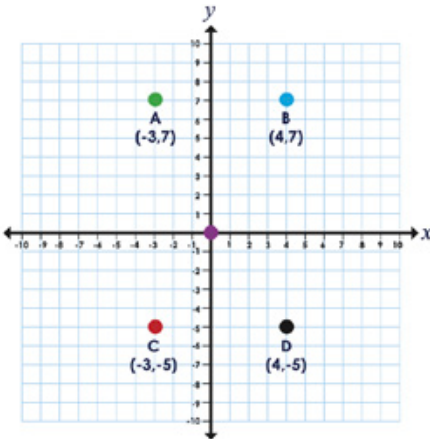
|                               |                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9. Angles in a triangle       | Angles in a triangle sum to 180°<br>                                                                                                                                                                                                                                                   |
| 10. Angles in a quadrilateral | Angles in a quadrilateral sum to 360°<br>                                                                                                                                                                                                                                             |
| 11. Angles in any polygon     | Any polygon can be split into several triangles to find the sum of the total interior angles.<br>$a + b + i = 180^\circ$<br>$c + d + h = 180^\circ$<br>$e + f + g = 180^\circ$<br>So, total sum of interior angles = 540°<br>This information allows us to find a missing angle.<br> |

|                              |                                                                                                                               |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 1. Angle                     | An angle is a _____ from one line segment to another. One whole turn is equal to 360 degrees.                                 |
| 2. Degree                    | The most common _____ of measurement for angles.                                                                              |
| 3. Acute Angle               | Less than _____                                                                                                               |
| 4. Right Angle               | Exactly _____                                                                                                                 |
| 5. Obfuse Angle              | Greater than _____ but less than _____                                                                                        |
| 6. Reflex Angle              | Greater than _____                                                                                                            |
| 7. Angles on a straight line | Angles on a straight line sum to _____<br> |
| 8. Angles around a point     | Angles around a point sum to _____<br>    |

|                               |                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9. Angles in a triangle       | Angles in a triangle sum to _____<br>                                                                                                                                                                                                                                                       |
| 10. Angles in a quadrilateral | Angles in a quadrilateral sum to _____<br>                                                                                                                                                                                                                                                 |
| 11. Angles in any polygon     | Any polygon can be split into several _____ to find the _____ of the total interior angles.<br>$a + b + i = 180^\circ$<br>$c + d + h = 180^\circ$<br>$e + f + g = 180^\circ$<br>So, total sum of interior angles = $540^\circ$<br>This information allows us to find a missing angle.<br> |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Coordinates                 | <p>Written in pairs and inside a bracket.</p> <p>The first number is the <math>x</math> coordinate (horizontal position).</p> <p>The second number is the <math>y</math> coordinate (vertical position).</p> <div><p>Point A is in the SECOND quadrant<br/>Point B is in the FIRST quadrant<br/>Point C is in the THIRD quadrant<br/>Point D is in the FOURTH quadrant<br/>The coordinate (0,0) is also known as the ORIGIN</p></div> |
| 2. Origin                      | <p>The coordinate (0,0) is where the <math>x</math> axis and <math>y</math> axis intersect.</p>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. Axis Plural-Axes            | <p><math>x</math> axis is horizontal (<math>y = 0</math>). <math>y</math> axis is vertical (<math>x = 0</math>).</p>                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4. Vertical lines              | <p>Always in the form <math>x = a</math>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5. Horizontal lines            | <p>Always in the form <math>y = a</math>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 6. Midpoint of two coordinates | <p>1. Add the <math>x</math> coordinates, divide by 2.<br/>2. Add the <math>y</math> coordinates, divide by 2.<br/>3. Write as a coordinate (<math>x, y</math>).<br/>E.g. The midpoint of (2, 2) and (8, 4) = (5, 3)</p> <p>midpoint of <math>x</math> coordinates: <math>\frac{2 + 8}{2} = \frac{10}{2} = 5</math></p> <p>midpoint of <math>y</math> coordinates: <math>\frac{2 + 4}{2} = \frac{6}{2} = 3</math></p>                                                                                                  |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Analogue | <div><p>2 o'clock      Quarter past 2</p><p>Half past 2      Quarter to 3</p></div> |
| 2. Digital  | <p>Times will appear differently on digital clocks depending on whether they are in 12-hour clock or 24-hour clock mode.</p>                                                                                                                                                                                                                                                                                                    |
| 3. Days     | <p>There are 24 hours in one day.</p>                                                                                                                                                                                                                                                                                                                                                                                           |
| 4. Hours    | <p>1 hour = 60 minutes</p>                                                                                                                                                                                                                                                                                                                                                                                                      |
| 5. Minutes  | <p>1 minute = 60 seconds</p>                                                                                                                                                                                                                                                                                                                                                                                                    |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Coordinates                 | <p>Written in pairs and inside a bracket.</p> <p>The first number is the _____ (horizontal position).</p> <p>The second number is the _____ (vertical position).</p> <div><p>Point A is in the _____ quadrant</p><p>Point B is in the _____ quadrant</p><p>Point C is in the _____ quadrant</p><p>Point D is in the _____ quadrant</p><p>The coordinate (0,0) is also known as the _____</p></div> |
| 2. Origin                      | The coordinate (0,0) is where the <i>x</i> axis and <i>y</i> axis _____ .                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3. Axis Plural-Axes            | <i>x</i> axis is horizontal ( <i>y</i> = 0). <i>y</i> axis is vertical ( <i>x</i> = 0).                                                                                                                                                                                                                                                                                                                                                                                             |
| 4. Vertical lines              | Always in the form _____                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 5. Horizontal lines            | Always in the form _____                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 6. Midpoint of two coordinates | <p>1. _____ the <i>x</i> coordinates, _____ by 2.</p> <p>2. _____ the <i>y</i> coordinates, _____ by 2.</p> <p>3. Write as a coordinate (<i>x</i>, <i>y</i>).</p> <p>E.g. The midpoint of (2, 2) and (8, 4) = (5, 3)</p> <p>midpoint of <i>x</i> coordinates: <math>\frac{2 + 8}{2} = \frac{10}{2} = 5</math></p> <p>midpoint of <i>y</i> coordinates: <math>\frac{2 + 4}{2} = \frac{6}{2} = 3</math></p>                                                                           |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Analogue | <div><p>2 o'clock      Quarter past 2</p><p>Half past 2      Quarter to 3</p></div> |
| 2. Digital  | Times will appear differently on _____ clocks depending on whether they are in 12-hour clock or 24-hour clock mode.                                                                                                                                                                                                                                                                                                             |
| 3. Days     | There are _____ hours in one day.                                                                                                                                                                                                                                                                                                                                                                                               |
| 4. Hours    | 1 hour = _____ minutes                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5. Minutes  | 1 minute = _____ seconds                                                                                                                                                                                                                                                                                                                                                                                                        |

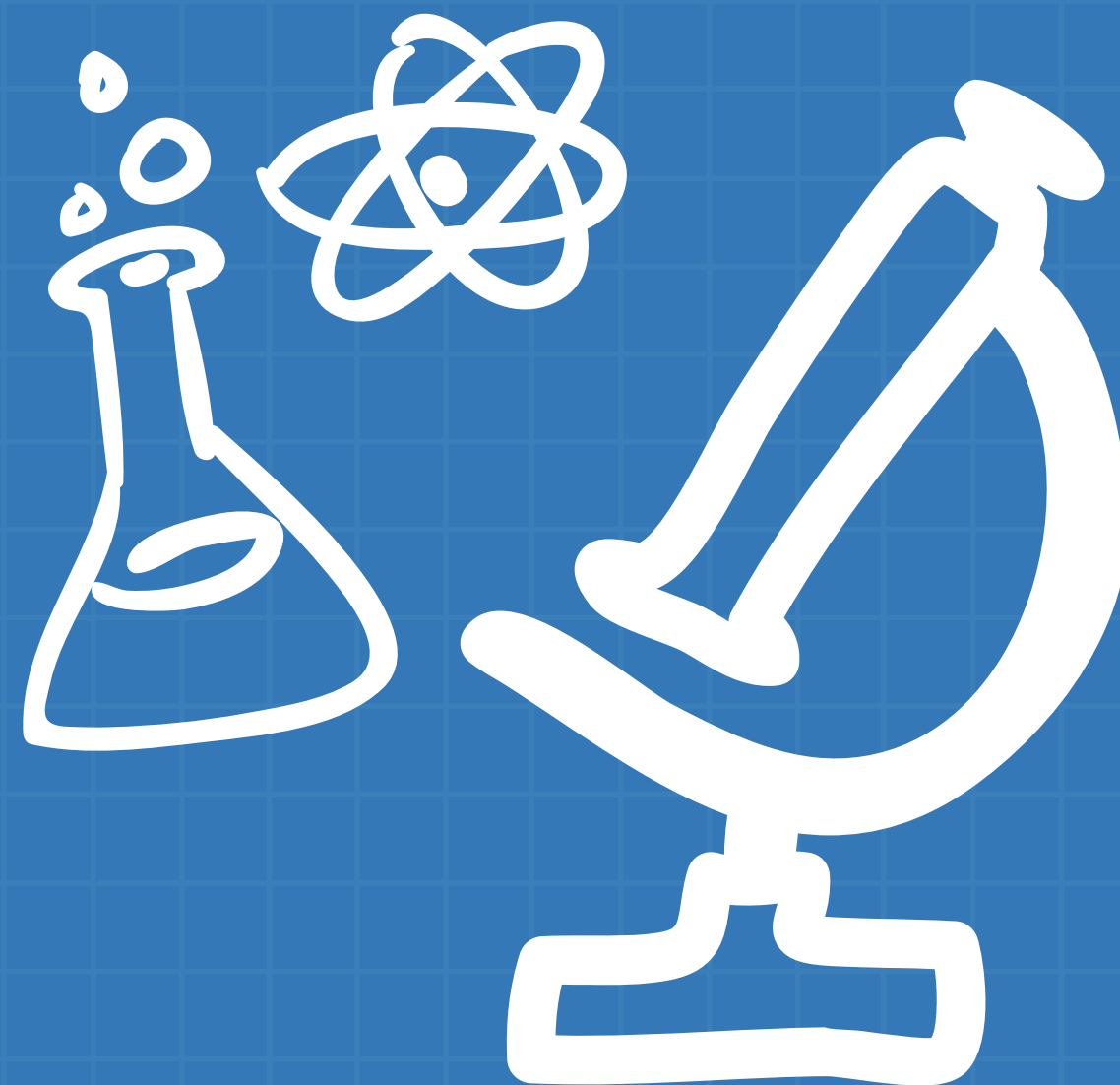


**YEAR 7**

# Science

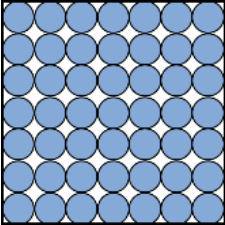
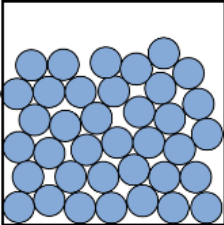
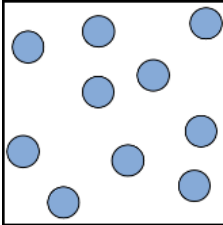


PARTICLES, SUBSTANCES AND MIXTURES  
GAS PRESSURE, DIFFUSION, CONSERVATION OF MASS  
CHROMATOGRAPHY & EVAPORATION  
CELLS, TISSUES AND ORGANS  
ENERGY  
REPRODUCTION  
CHEMICAL REACTIONS  
FORCES & MOTION





The particle model of matter

| State                        | Solid                                                                             | Liquid                                                                            | Gas                                                                                 |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Diagram                      |  |  |  |
| Arrangement                  | ordered and all touching                                                          | random and all touching                                                           | random and not touching                                                             |
| Movement                     | vibrate in fixed positions                                                        | move and slide over each other                                                    | move around quickly in random directions                                            |
| Attraction between Particles | strong                                                                            | weak                                                                              | very weak                                                                           |

Explaining The Properties Of Solids

| Property                        | Reason                                                                          |
|---------------------------------|---------------------------------------------------------------------------------|
| Fixed shape and cannot flow     | Strong forces of attraction between the particles keep them in fixed positions. |
| Cannot be compressed (squashed) | Particles are all touching and have no space to move into.                      |

Explaining the properties of liquids

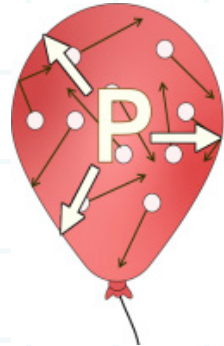
| Property                              | Reason                                                                               |
|---------------------------------------|--------------------------------------------------------------------------------------|
| Takes shape of container and can flow | Weak forces of attraction between the particles, so they can move around each other. |
| Cannot be compressed (squashed)       | Particles are all touching and have no space to move into.                           |

Explaining The Properties Of Gases

| Property                              | Reason                                                                                      |
|---------------------------------------|---------------------------------------------------------------------------------------------|
| Takes shape of container and can flow | Very weak forces of attraction between the particles, allowing them to move and spread out. |
| They can be compressed (squashed)     | Particles are not touching and have space to move into.                                     |

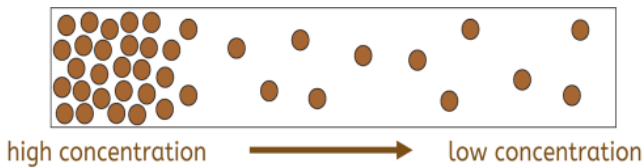
Gas pressure

When gas particles collide with the walls of their container, this creates a constant force on the walls of the container. This causes pressure. The faster the particles move, the higher the gas pressure. The gas pressure inside containers can be increased by adding more particles or increasing the temperature. The more frequent the collisions, the higher the gas pressure.



Diffusion

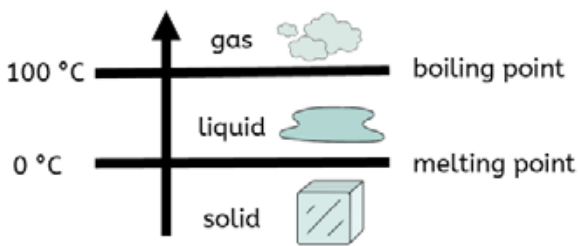
Diffusion is the random movement of particles from an area of high concentration to an area of low concentration. Particles of substances in the liquid and gas states can diffuse because their particles can move freely.



Melting and boiling points

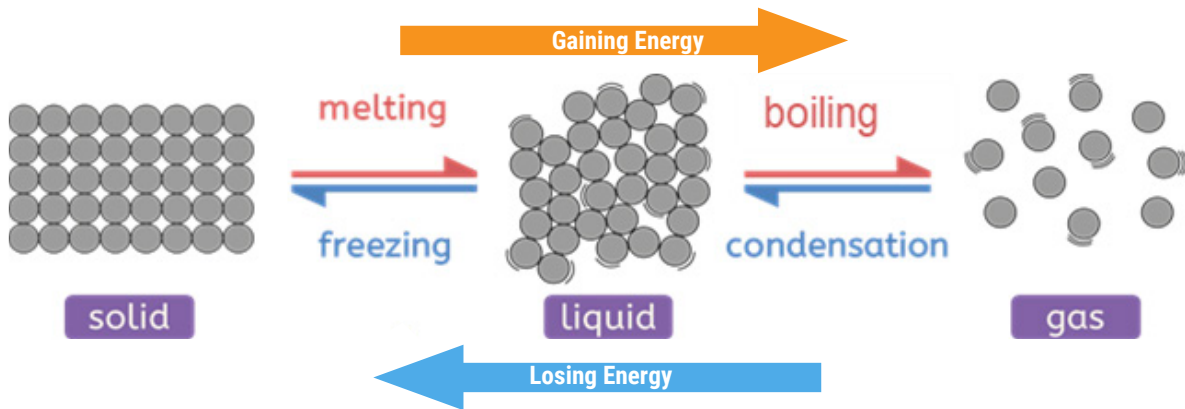
**Melting point:** the temperature at which a substance changes from a solid to a liquid

**Boiling point:** the temperature at which a substance changes from a liquid to a gas, e.g. water



Change of State

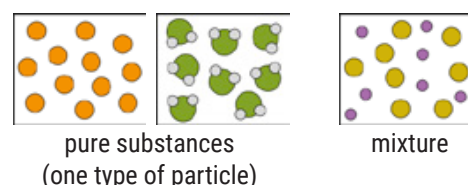
A change of state is a physical change because no new substances are made, and the change is reversible. Only the amount of energy the particles have changes, which affects the arrangement and movement of the particles. Temperature stays constant during a change of state.



## Pure substances and mixtures

A **pure substance** is one that contains only one substance, e.g. pure iron contains only iron particles.

A **mixture** contains two or more substances that are not joined together and can be physically separated.

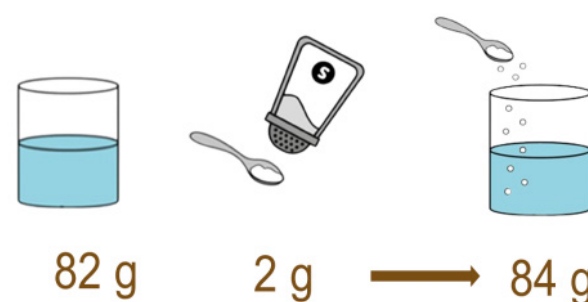
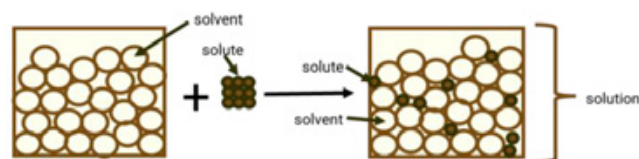


## Pure substances and mixtures

A **solute** can be dissolved in a **solvent**. The mixture created is called a **solution**. When no more solute can dissolve in the solution, it is a **saturated** solution. If a solid dissolves in a solvent, it is **soluble**. If it does not dissolve in a solvent, it is **insoluble**. **Solubility** is a measure of how much solute can dissolve in a solvent. The higher the temperature of the solvent, the greater the mass of the solute that can be dissolved.

Solubility is different for different solutes. The solubility of a solute will change depending on the solvent used.

During **dissolving**, the solute particles are separated and fit between the solvent particles to make a solution.



### Conservation of mass

When a solution is formed, the mass of the solvent + the mass of the solute = the mass of the solution.  
Mass remains constant because the number of particles is the same before dissolving as it is after.

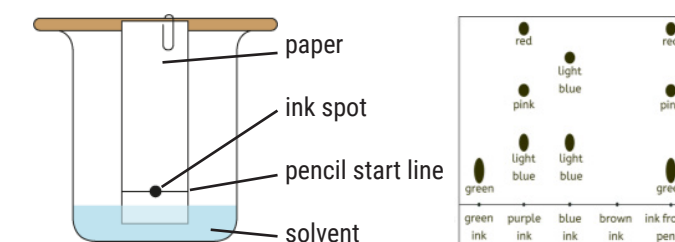
## Separating mixtures

We can separate mixtures in different ways depending on their properties

**Chromatography** is a separation technique that separates mixtures containing more than one solute based on their solubilities in a solvent. It works because some of the coloured substances dissolve better than others, so they travel further up the paper.

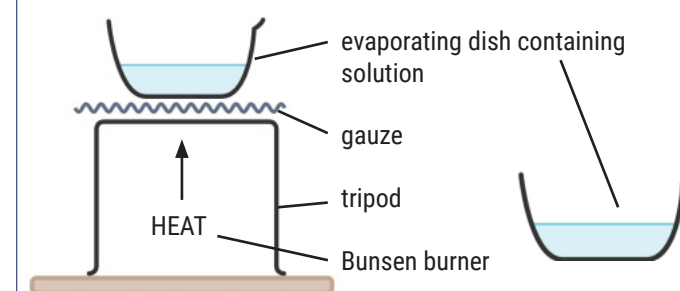
A pencil line is drawn, and spots of ink or dye are placed on it. There is a container of solvent (e.g. water or ethanol). As the solvent continues to travel up the paper, the different coloured substances spread apart.

A **chromatogram**, the results of chromatography experiment.



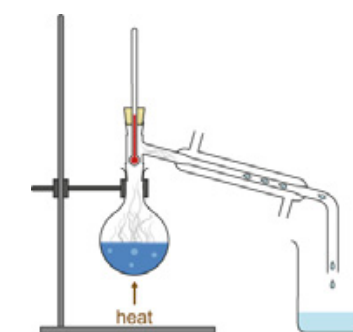
**Evaporation** and crystallisation can be used to separate a soluble solid from a solution. For example, copper sulphate is soluble in water – its crystals dissolve in water to form a copper sulphate solution.

During evaporation, the water evaporates away, leaving solid copper sulphate crystals behind. Crystallisation produces larger solid crystals.



**Distillation** is a separation technique used to separate a mixture of liquids. The basis for separation in distillation is the difference in the boiling points of the components.

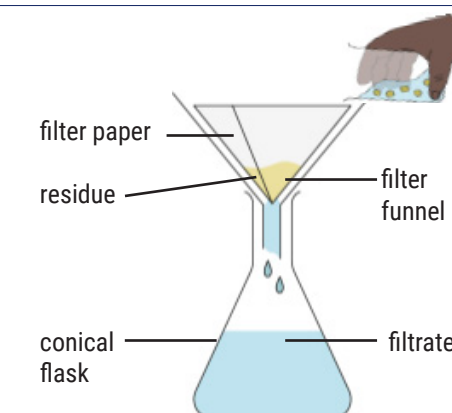
For example, water can be separated from an ink and water solution because water has a much lower boiling point than ink. When the solution is heated, water evaporates. It is then cooled and condensed into a separate container. The ink does not evaporate, so it stays behind.



**Filtration** can be used to separate a liquid from an insoluble solid. The filter paper used in filtration is 'selectively permeable', meaning that it has holes in it that allow the movement of only some substances through whilst preventing the movement of others.

The insoluble solid is unable to pass through the small holes of the filter paper. When a mixture of sand and water is filtered:

- The sand stays behind in the filter paper (it becomes the residue).
- The water passes through the filter paper (it becomes the filtrate).



Questions

- 1. What is the arrangement of particles in a solid?
- 2. How do particles move in a liquid?
- 3. Why can gases be compressed?
- 4. What causes gas pressure?
- 5. What is diffusion?
- 6. Which states of matter can diffuse?
- 7. What is melting point?
- 8. What is boiling point?
- 9. Are changes of state reversible?
- 10. What happens to temperature during a change of state?

Questions

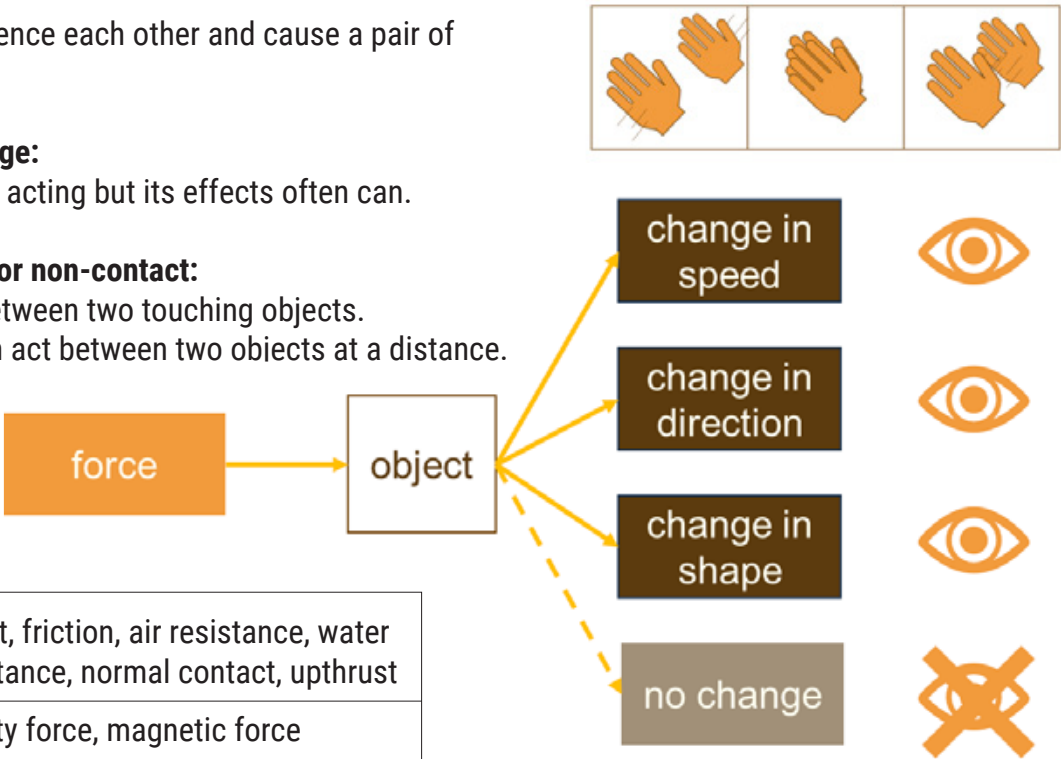
- 11. What is a pure substance?
- 12. What is a mixture?
- 13. What is a solute?
- 14. What is a solvent?
- 15. What is a solution?
- 16. What is a saturated solution?
- 17. What does soluble mean?
- 18. **How** are insoluble solids separated from liquids?
- 19. How can dissolved solids be recovered?
- 20. What happens to mass when a substance dissolves?

Forces and their interactions

**Interaction:**  
When two objects influence each other and cause a pair of forces to arise.

**Forces can cause change:**  
A force cannot be seen acting but its effects often can.

**Forces can be contact or non-contact:**  
Contact forces arise between two touching objects.  
Non-contact forces can act between two objects at a distance.



|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| contact     | thrust, friction, air resistance, water resistance, normal contact, upthrust |
| non-contact | gravity force, magnetic force                                                |

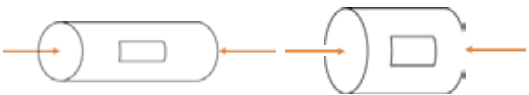
Free-body force diagrams



**One object**  
Arrows to show size and direction of forces

- Labelled forces:
- What kind of force is acting?
  - What is the force acting on?
  - What exerts the force?

Deforming forces



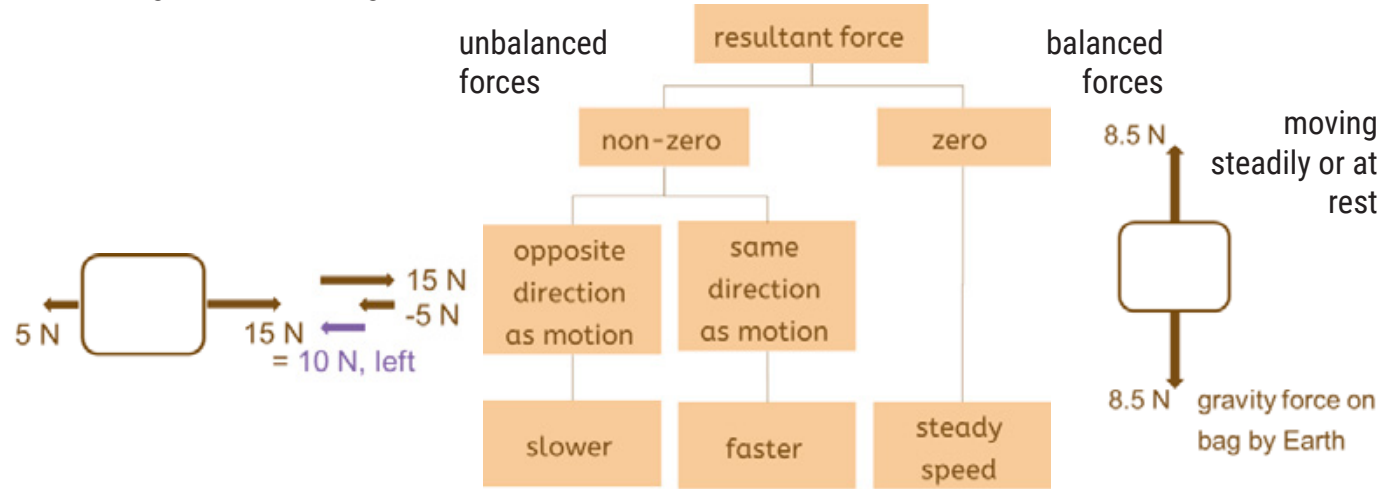
Two pushing forces cause compression:  
the object contracts.



Two pulling forces cause tension:  
the object extends.

Combining forces

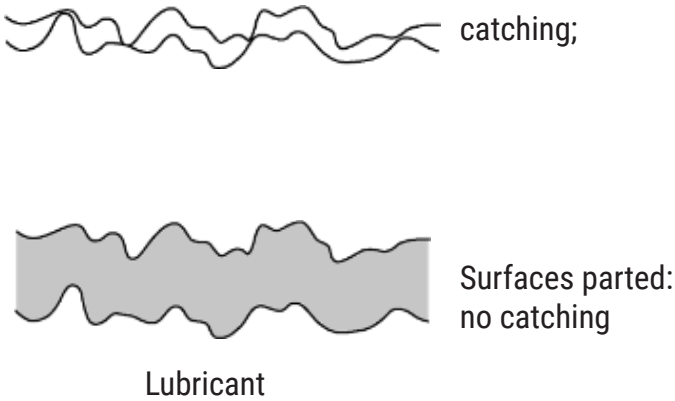
- More than one force acting:**
- Their effects are combined
  - As if a single force is acting: the resultant force



Friction Force

- **What?** One of three frictional forces. They act to resist motion.
- **Where?** Acts between solid surfaces, along the surfaces.
- **When?** An object is sliding or trying to. When starting to slide, the applied force must be larger than the limiting friction: so, an unbalanced force acts.
- **How?** Opposite direction to the motion, or the applied force.
- **Why?** Surfaces are uneven, so the 'catching' between them must be overcome.

|               | Useful | Nuisance |
|---------------|--------|----------|
| Walking       | ✓      |          |
| Machines      |        | ✓        |
| Driving       | ✓      |          |
| Wear and tear |        | ✓        |



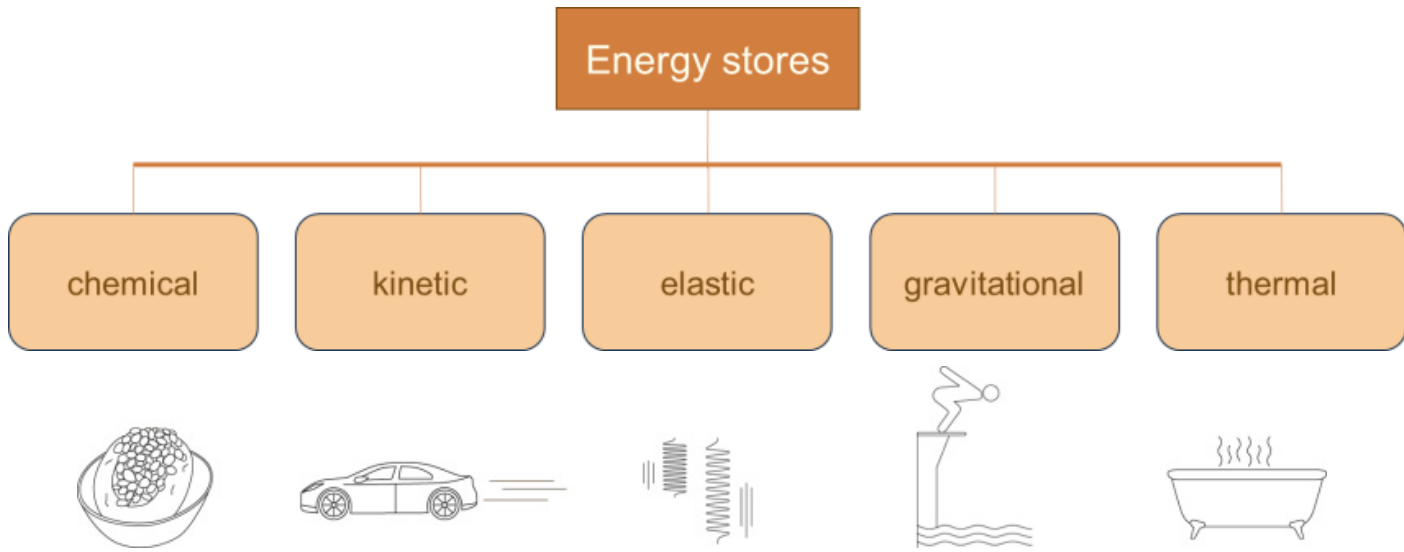


Energy stores and pathways

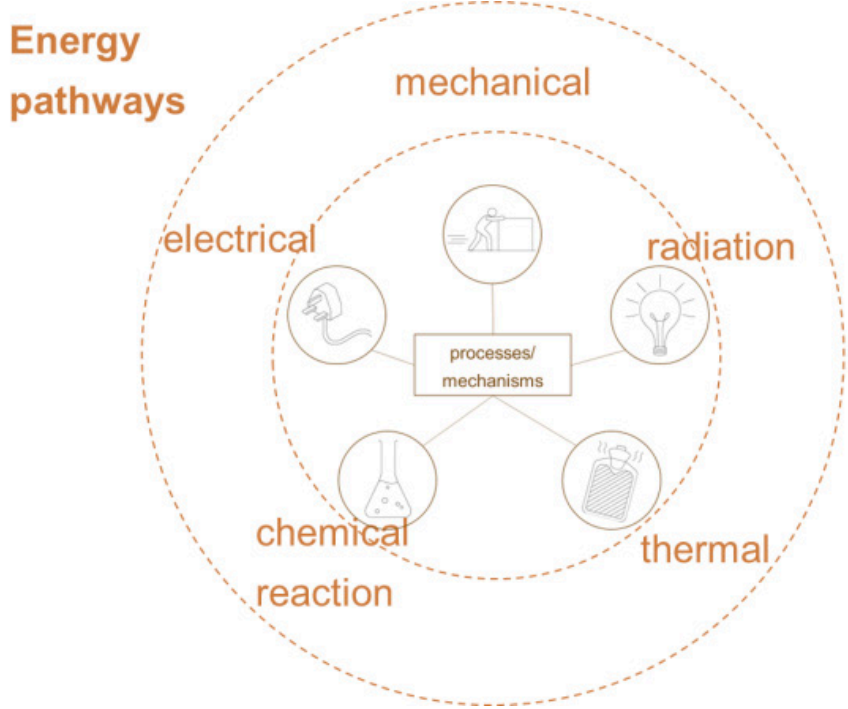
What energy does:

- Flows between objects in a system
- Stays the same when it transfers
- Cannot be used up

Energy is transferred between stores:



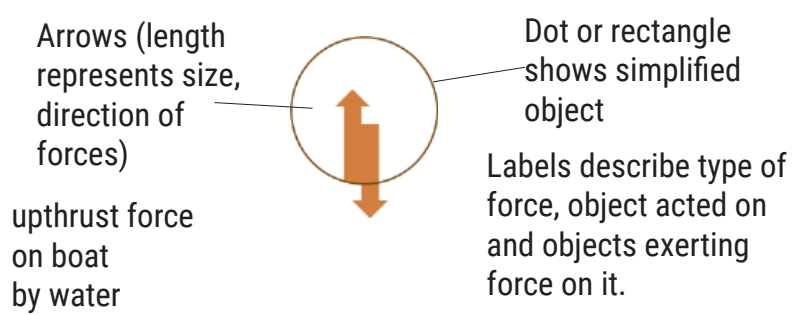
Energy is transferred because of processes, by pathways:



Modelling forces

Forces are modelled because:

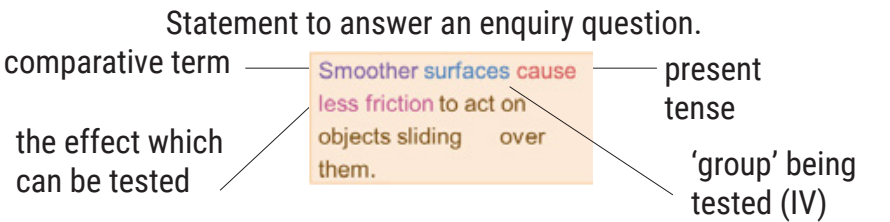
- forces cannot be seen acting
- there are many forces acting at a time
- their size and direction have important effects on situations, so need to be shown.



Investigating forces

Scientific methods:

- With or without hypothesis
- Manipulating variables or not



Planning to collect high-quality data:

- Measuring with skill
- Preparing the data table
- Repeatable data

A diagram showing a force meter being checked for zero. Below it is a table with the following data:

| Surface       | Force to start sliding (N) |     |     | DV in columns |
|---------------|----------------------------|-----|-----|---------------|
|               | 1                          | 2   | 3   |               |
| Glass         | 1.4                        | 1.5 | 1.7 | repeated      |
| Metal         | 1.5                        | 1.6 | 1.7 |               |
| Polished wood | 2.0                        | 2.3 | 2.2 |               |
| Plastic       | 2.9                        | 3.0 | 2.9 |               |
| Paper         | 4.5                        | 3.8 | 4.0 |               |

Labels include: 'Check force-meter is on zero with no force.', '(IV)', and 'DV in columns'.

**Peer review:** ★★★  
 Peers (people of a similar level of knowledge) test the results for quality.

- Repeatability: Same group, same results
- Reproducibility: Different group, same results

Observing by measurement

Using a scale

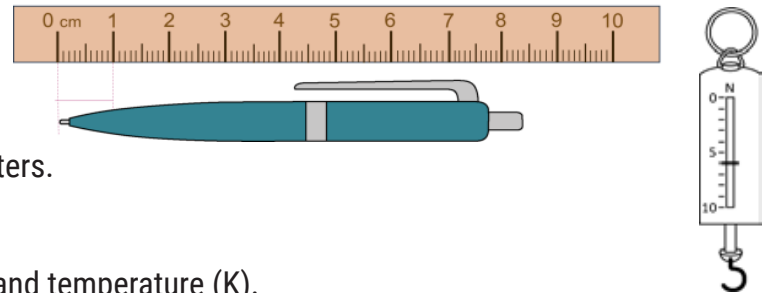
- set of lines at equal increments
- Labelled with numbers and units

Measuring instruments

- Include rulers, balances, clocks and thermometers.
- Force is measured using a force-meter.

Quantities: and their units

Base quantities: length (m), mass (kg), time (s) and temperature (K).  
 Derived quantities include force (N).



Questions

|                                                            |
|------------------------------------------------------------|
| 1. What is a force?                                        |
| 2. What happens during an interaction between two objects? |
| 3. What is an example of a contact force?                  |
| 4. What is an example of a non-contact force?              |
| 5. What does friction do?                                  |
| 6. What is a resultant force?                              |
| 7. What are balanced forces?                               |
| 8. What are unbalanced forces?                             |
| 9. What is compression?                                    |
| 10. What is tension?                                       |

Questions

|                                              |
|----------------------------------------------|
| 11. What does a force diagram show?          |
| 12. Which instrument measures force?         |
| 13. What is the unit of force?               |
| 14. What happens to energy during transfers? |
| 15. What does friction depend on?            |
| 16. What is repeatability?                   |
| 17. What is reproducibility?                 |
| 18. What is an independent variable?         |
| 19. What is a dependent variable?            |
| 20. What is an example of a base quantity?   |



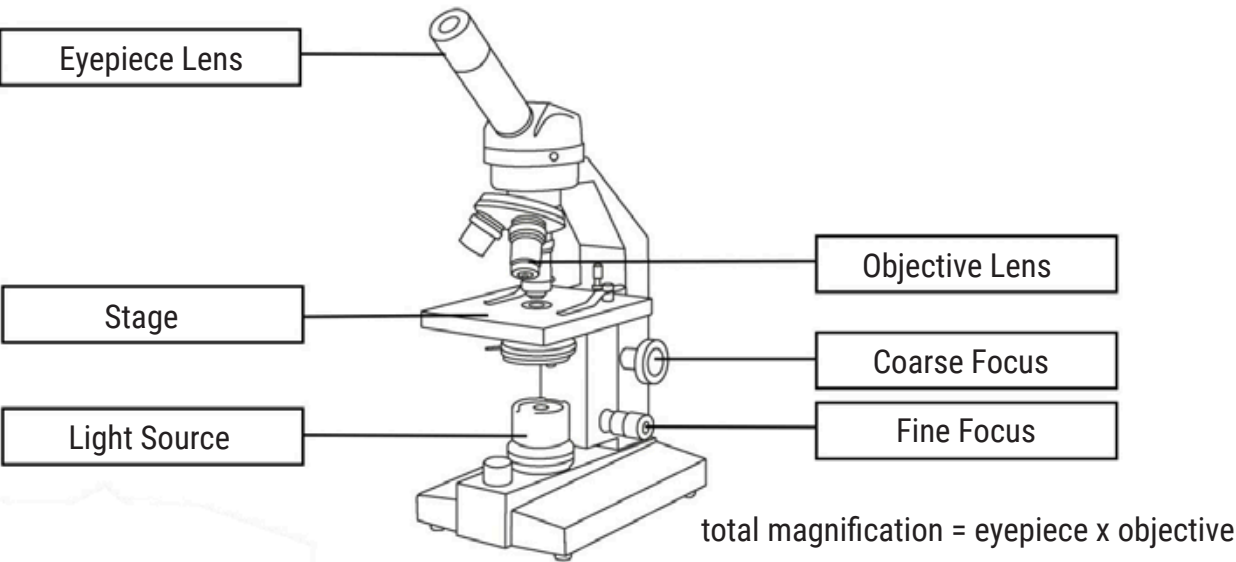
The seven common processes of living organisms

| Process             | Definition                                                |
|---------------------|-----------------------------------------------------------|
| <b>Movement</b>     | moving itself or its parts to change position or location |
| <b>Reproduction</b> | producing offspring of the same kind                      |
| <b>Sensitivity</b>  | sensing and responding to changes in their surroundings   |
| <b>Growth</b>       | increasing in size and repairing parts that are damaged   |
| <b>Respiration</b>  | using oxygen and glucose (a sugar) to provide energy      |
| <b>Excretion</b>    | removal of waste substances that are no longer needed     |
| <b>Nutrition</b>    | using food or other nutrients like water to stay alive    |

Levels of organisation

|                     |                                                                                                       |             |   |              |   |                     |
|---------------------|-------------------------------------------------------------------------------------------------------|-------------|---|--------------|---|---------------------|
| <b>Cell</b>         | →                                                                                                     | <b>Cell</b> | → | <b>Organ</b> | → | <b>Organ System</b> |
| <b>Cell</b>         | the smallest structural unit of all organisms.                                                        |             |   |              |   |                     |
| <b>Tissue</b>       | a group of similar cells that work together to perform a specific function                            |             |   |              |   |                     |
| <b>Organ</b>        | a structure made up of different types of tissues that work together to carry out a specific function |             |   |              |   |                     |
| <b>Organ System</b> | a group of organs that work together to perform a common function                                     |             |   |              |   |                     |

The parts of the microscope

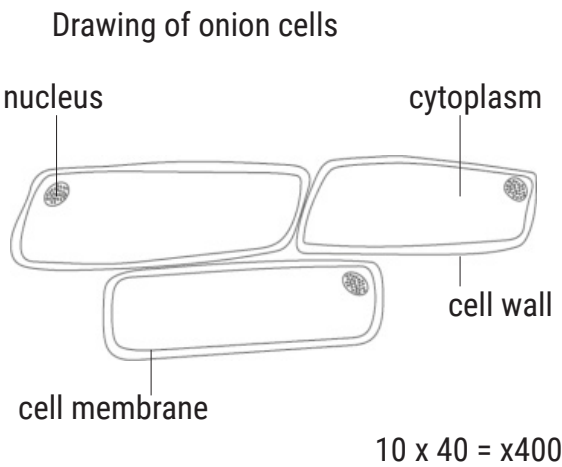


Using a microscope

1. Turn the **objective lens** to the **lowest magnification**.
2. Secure the slide on the **stage** using the clips.
3. Move the **stage** up to the **objective lens** by turning the **coarse focus**.
4. Look down the **eyepiece lens**, and move the stage away by turning the **coarse focus**.
5. To make the image sharper and clearer, turn the **fine focus**.
6. Rotate the **objective lens** to get a higher magnification.

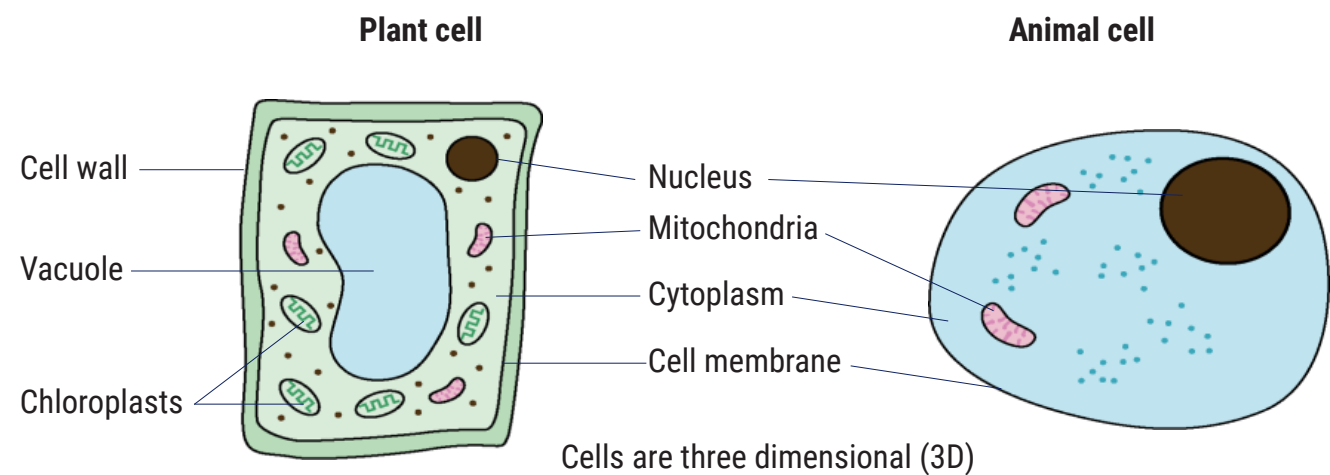
Rules for scientific drawings of cells

- smooth continuous lines
- Large, with the same proportions
- Stippling
- A few cells
- Title and label
- Total magnification



Cell organelles and their functions

|                      |                                                         |
|----------------------|---------------------------------------------------------|
| <b>Nucleus</b>       | contains the genome that controls the cell's activities |
| <b>Cytoplasm</b>     | where the chemical reactions of the cell take place     |
| <b>Mitochondria</b>  | where energy is released in respiration                 |
| <b>Cell membrane</b> | controls which substances enter or leave the cell       |
| <b>Vacuole</b>       | stores a watery sap                                     |
| <b>Cell wall</b>     | strengthen and support the cell                         |
| <b>Chloroplasts</b>  | where light is trapped for photosynthesis to happen     |



**Oxygen** and **glucose** (a sugar) are needed for **respiration** to take place in cells, to provide energy to keep cells alive. These useful substances enter the cell by **diffusion**. Waste products of respiration are carbon dioxide and water. Waste products leave the cell by diffusion and need to be removed from cells to keep them alive.

The rate of diffusion

The rate of diffusion means how fast diffusion happens. Three factors that can affect the rate of diffusion are **temperature**, the **concentration** of particles and **surface area**.

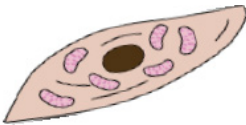
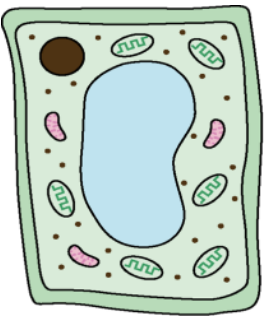
- The higher the temperature, the faster the rate of diffusion.
- The bigger the difference in the concentration of particles, the faster the rate of diffusion.
- The larger the surface area, the faster the rate of diffusion.

Needs of plants and animals for survival

- Plants need, oxygen, water, light, carbon dioxide, minerals, a suitable temperature and space to grow.
- Animals, including humans, need water, oxygen, nutrients and the right temperature to survive.
- Plants and animals need these to keep all the cells that make them up alive and functioning properly.

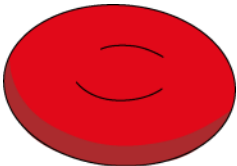
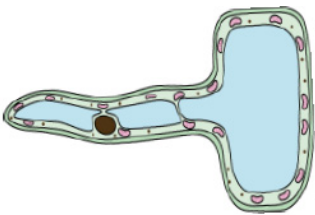
Specialised cells are adapted to carry out a specific function

A palisade cell has lots of chloroplasts that absorb light for photosynthesis and a column shape to pack more in the leaf.



A muscle cell has lots of mitochondria to release energy for contraction.

A root hair cell has a long cell membrane that provides a large surface area to absorb more water and minerals.



A red blood cell has no nucleus for extra space to carry more oxygen.

Questions

1. What is a cell?
2. What is a tissue?
3. What is an organ?
4. What is an organ system?
5. What is the function of the nucleus?
6. What is the function of cytoplasm?
7. What is the function of mitochondria?
8. What is the function of the cell membrane?
9. What do chloroplasts do?
10. What is diffusion?

Questions

11. Name one factor that affects diffusion.
12. What is respiration?
13. What do animals need to survive?
14. What do plants need to survive?
15. What is a specialised cell?
16. Name an example of a specialised cell.
17. What happens to diffusion when temperature increases?
18. How do you calculate total magnification of a microscope?
19. Why do root hair cells have a large surface area?
20. Why do red blood cells lack a nucleus?

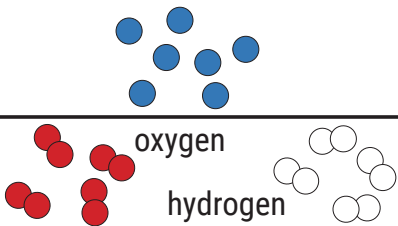
Atom & Element

**Atom** The smallest particle of matter, which all things are made of.

**Element** A pure substance that is made of only one type of atom. All atoms of an element are identical, e.g. Gold is an element made up of gold atoms only. The 118 known elements are listed on the periodic table of elements.

The atoms of some elements do not join together, but instead they stay as separate atoms, e.g. helium.

The atoms of other elements join together to make molecules, e.g. oxygen and hydrogen.



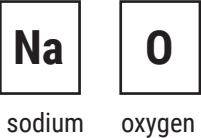
Properties of elements

Individual atoms do not have the properties of the element. The properties of an element are because of the arrangement and behaviour of the atoms as a group.

| Metals                                                                | Non-Metals                                                          |
|-----------------------------------------------------------------------|---------------------------------------------------------------------|
| most are shiny                                                        | most are dull                                                       |
| most are hard                                                         | solid non-metals are soft and easy to cut, except carbon as diamond |
| most are strong                                                       | most are not strong                                                 |
| most are sonorous (makes a ringing sound when hit)                    | most are not sonorous                                               |
| malleable (easy to reshape without breaking)                          | not malleable                                                       |
| most are ductile (can be drawn out into a long wire without breaking) | not ductile                                                         |
| most have very high melting and boiling points                        | most have very low melting and boiling points                       |
| some but not all are magnetic                                         | not magnetic                                                        |
| Conduct electricity                                                   | non-metals do not conduct electricity, except carbon as graphite    |
| good at conducting heat                                               | poor at conducting heat                                             |

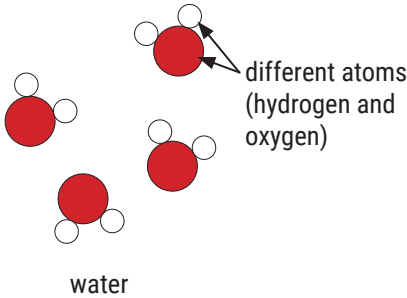
Writing element symbols

The first letter is always written as a capital letter and if there is a second letter, it is always written as a lowercase letter. Element symbols make writing elements easier and allow scientists all over the world to communicate and write about them.



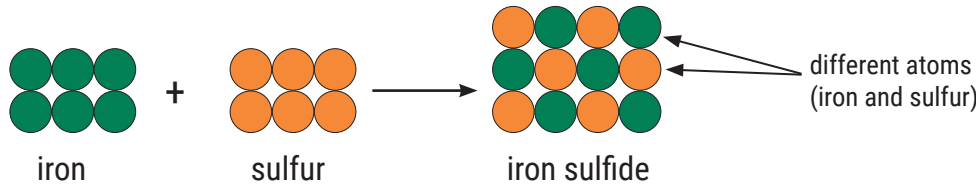
Compound

A substance made of two or more different elements chemically joined (bonded) together. A chemical bond is a strong force that holds atoms together in a compound. Lots of energy is needed to break a chemical bond. A compound cannot be easily separated. A compound may have very different properties to those of the elements from which it is made. Water is a compound of hydrogen and oxygen. Each of its molecules contains two hydrogen atoms and one oxygen atom.



Chemical reactions

When chemicals react, the atoms are rearranged. For example, iron reacts with sulfur to make iron sulfide. Iron sulfide, the compound formed in this reaction, has different properties to the elements it is made from.



|                              | iron         | sulfur  | iron sulfide |
|------------------------------|--------------|---------|--------------|
| Type of substance            | element      | element | compound     |
| Colour                       | silvery grey | yellow  | black        |
| Is it attracted to a magnet? | yes          | no      | no           |

Conservation of mass

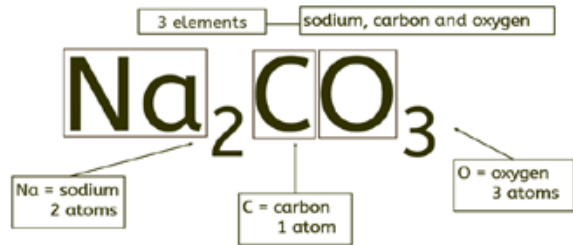
Atoms are not destroyed nor created during chemical reactions, so in any reaction:  
 Total mass of reactants = total mass of products

**Naming metal and non-metal compounds**  
 The metal element (furthest left on the periodic table) comes first in the name of the compound. The ending for the non-metal is shortened and changed to ‘-ide’. E.g. iron + sulfur → iron sulfide

**Naming three element compounds containing oxygen**  
 The metal element (furthest left on the periodic table) comes first in the name of the compound. If there are three elements in the compound, and one of them is oxygen, the ending of the non-metal is shortened and changed to ‘-ate’. E.g. lithium + nitrogen + oxygen → lithium nitrate

Chemical formulae

A chemical formula uses chemical symbols and numbers to show how many of each atom is present in a compound. The small numbers (subscript) go at the bottom. For example: CO<sub>2</sub> is correct; C02 and C02 are wrong.



The formula for sodium carbonate is Na<sub>2</sub>CO<sub>3</sub>. It tells you that sodium carbonate contains two sodium atoms (Na x 2), one carbon atom (C) and three oxygen atoms (O x 3).

## Chemical equations

We summarise chemical reactions using equations: reactants  $\longrightarrow$  products

- **Reactants** are shown on the left of the arrow;
- **Products** are shown on the right of the arrow.

Do not write an '=' sign instead of an arrow.

If there is more than one reactant or product, they are separated by a '+' sign.

For example:  
copper + oxygen  $\longrightarrow$  copper oxide

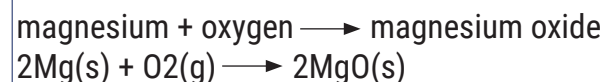
**Reactants:** copper and oxygen  
**Products:** copper oxide

A word equation shows the names of each substance involved in a reaction and must not include any chemical symbols or formulae.

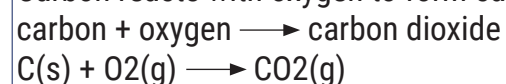
## Oxidation reactions

In oxidation reactions, a substance gains oxygen. Metals and non-metals can take part in oxidation reactions (be oxidised).

Magnesium reacts with oxygen to form magnesium oxide:



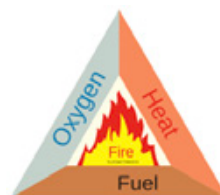
Carbon reacts with oxygen to form carbon dioxide:



Another example is a combustion reaction, where we burn fuels in oxygen:



- Combustion is another name for burning fuels.
- It is an exothermic reaction.
- The fire triangle shows three components which, when combined, provide the right conditions for combustion to happen.



## Exothermic and Endothermic reactions

- Exothermic reaction - **transfers** energy to the thermal store of the surroundings. This causes a **rise** in temperature (**positive** temperature change).
- Hand warmers transfer energy to the thermal store of the surroundings by an exothermic oxidation reaction.
- **Endothermic reaction** - **transfers** energy in from the thermal store of the surroundings. This causes a **drop** in temperature (**negative** temperature change).
- Sports injury packs transfer energy from the thermal store of the surroundings by an endothermic reaction.

Temperature data collected from exothermic and endothermic reactions can be improved by:

- Using a **polystyrene** cup as an insulator, as it reduces energy transfers to or from the surroundings.
- Using a **lid** to reduce energy transferred from the surface.
- Using a **digital thermometer**, which is easier to read than a regular thermometer and, if it measures in decimal places, also has better resolution.

## State symbols

State symbols in chemical formulae provide information about the physical state of the reactants and products.

(s) – solid, (l) – liquid, (g) – gas, and (aq) – aqueous solution (i.e. dissolved in water).

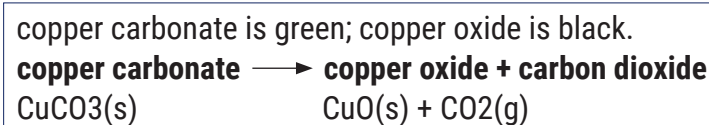
The state symbol comes after the chemical formula and is written in lower case and in brackets.  
E.g.  $\text{CuCO}_3\text{(s)} \longrightarrow \text{CuO(s)} + \text{CO}_2\text{(g)}$

## Thermal decomposition reactions

This is the breaking down of a substance, using heat, to form two or more products.  
It is an endothermic reaction.

Many metal carbonates take part in thermal decomposition reactions.

For example, copper carbonate:





Questions

- What is an atom?
- What is an element?
- What is a compound?
- What is a chemical bond?
- What happens during a chemical reaction?
- What is conservation of mass?
- Where are reactants shown in an equation?
- Where are products shown in an equation?
- What does (s) mean in a chemical equation?
- What does (g) mean in a chemical equation?

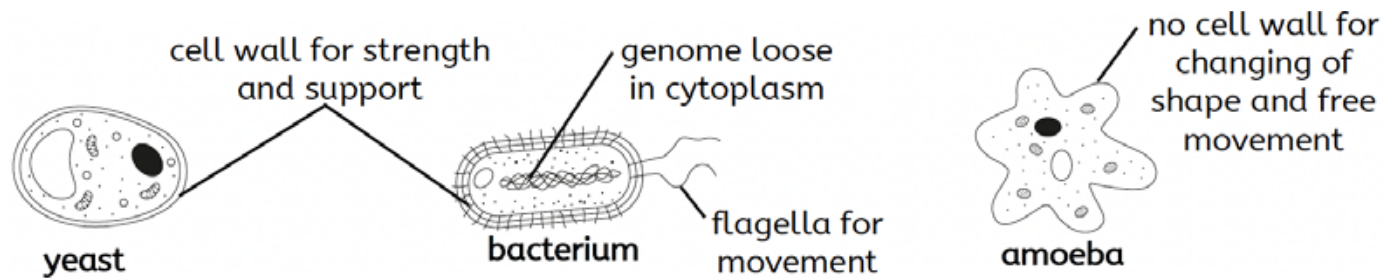
Questions

- What is oxidation?
- What is combustion?
- Is combustion exothermic or endothermic?
- What is an exothermic reaction?
- What is an endothermic reaction?
- What is thermal decomposition?
- Name one product of combustion.
- How are compounds named (metal + non-metal)?
- What suffix is used for compounds with three elements?
- What does the formula CO<sub>2</sub> mean in terms of atoms of each element?

Organ systems

- Unicellular organisms are made of only one cell (e.g. bacteria, amoeba and yeast).
- They can carry out the 7 life processes of living organisms, all in one cell.
  - Unicellular organisms share common organelles, but they also have adaptations.
  - Unicellular organisms can be helpful or harmful.
  - Unicellular organisms use diffusion to exchange substances.

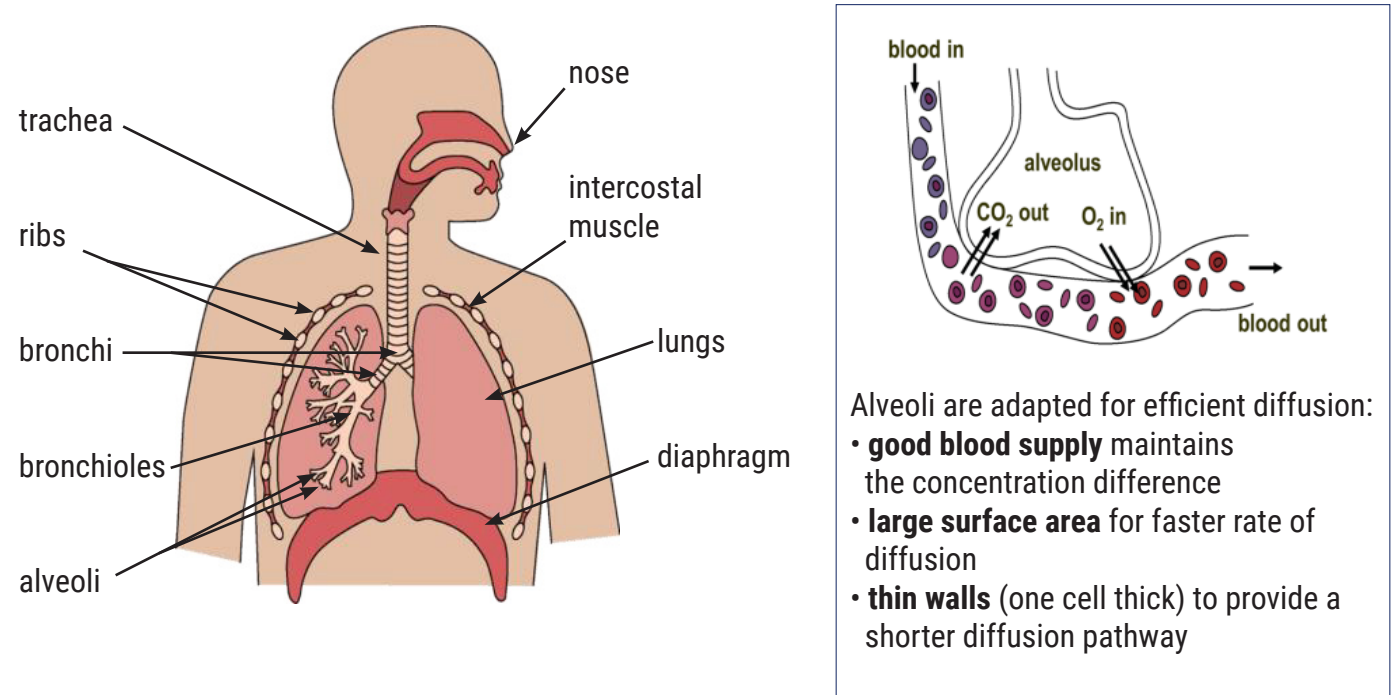
- Used in baking
  - Used to make alcoholic drinks
  - Supports digestion
  - Used to make cheese and yoghurt



- Multicellular organisms are made of many cells e.g. plants and humans).
- They are larger and more complex than unicellular organisms.
  - They cannot rely on diffusion alone for exchanging substances.
  - Multicellular organisms depend on tissues, organs, and organ systems working together to exchange and transport substances to cells of the body, to keep cells alive.
  - Organ systems in humans include the **gas exchange system, digestive system, circulatory system, skeletal system and muscular system.**

Gas exchange system

Air is a mixture of gases, including oxygen and carbon dioxide. The human gas exchange system allows for the exchange of oxygen and carbon dioxide between an organism and its environment. Inhaled air contains more oxygen than exhaled air. Exhaled air contains more carbon dioxide than inhaled air. Oxygen moves from the alveoli into cells and then into the blood vessels (capillaries), while carbon dioxide moves in the opposite direction via diffusion.



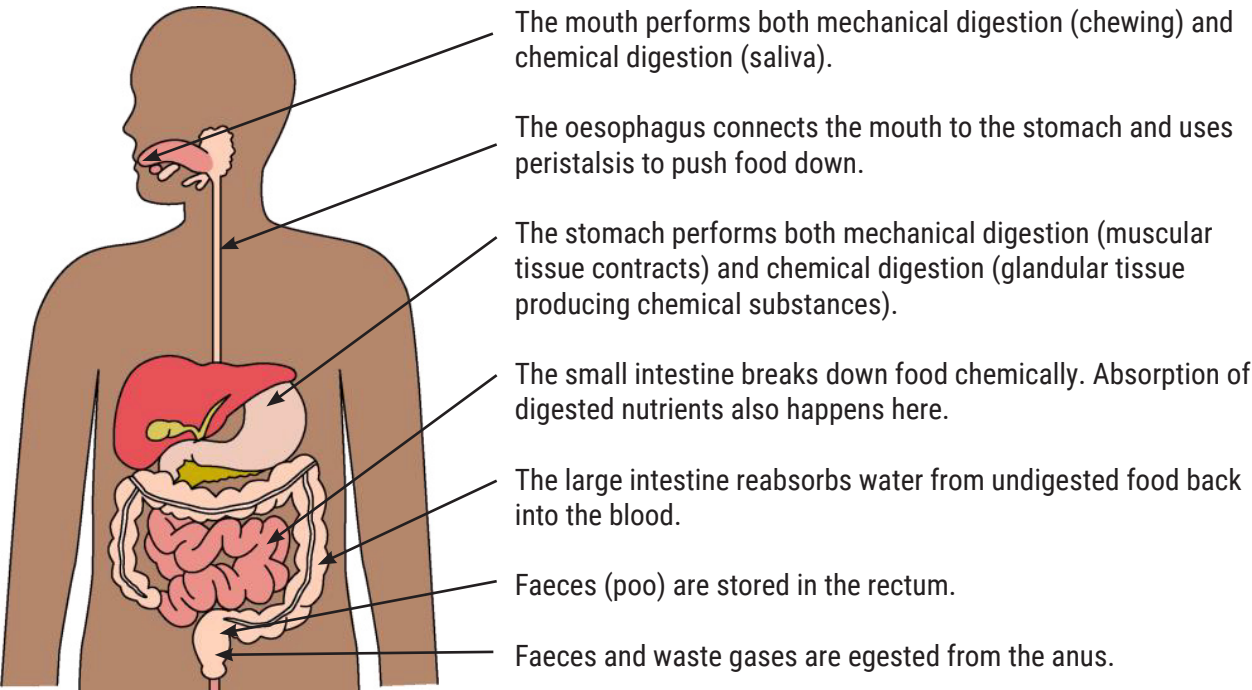
**Breathing** involves changes in pressure and volume inside the chest, helped by the movement of intercostal muscles and diaphragm, which causes the movement of the ribcage.  
**Vital capacity** is the maximum volume of air exhaled after inhaling fully and can be used to estimate lung volume.

|                       | Inhalation                    | Exhalation                |
|-----------------------|-------------------------------|---------------------------|
| Intercostal muscles   | contract                      | relax                     |
| Ribcage               | pulled up and out             | released down and in      |
| Diaphragm             | contracts and moves downwards | relaxes and moves upwards |
| Volume in the chest   | increases                     | decreases                 |
| Pressure in the chest | decreases                     | increases                 |
| Movement of air       | into the lungs                | out of the lungs          |

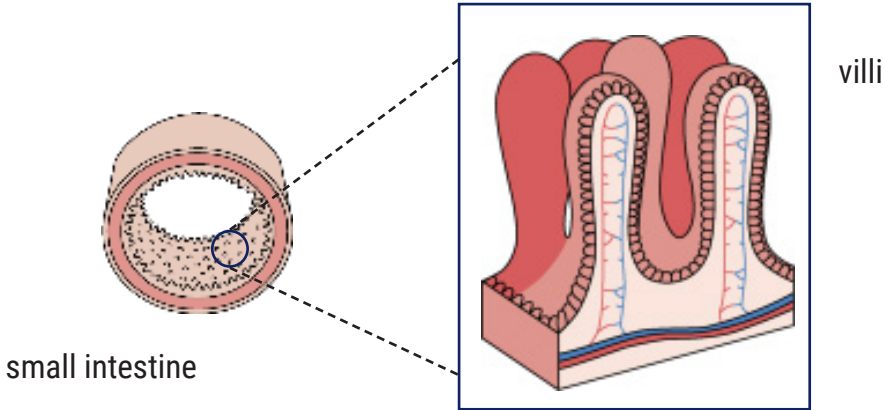
Digestive system

The human digestive system breaks down large, insoluble food molecules into small, soluble molecules so that they can be absorbed into the blood.

- Mechanical digestion: the physical breakdown of food into smaller pieces.
- Chemical digestion: the use of chemical substances to break food down into smaller molecules.

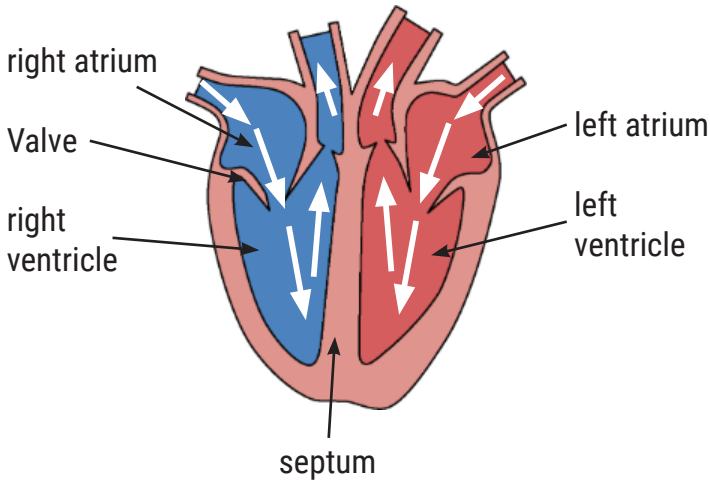


- Adaptations:
- The small intestine is covered in many villi for efficient absorption by diffusion:
- villi provide a large surface area for faster rate of diffusion
  - villi have good blood supply to maintain the concentration difference
  - villi have thin walls (one cell thick) to provide a shorter diffusion pathway

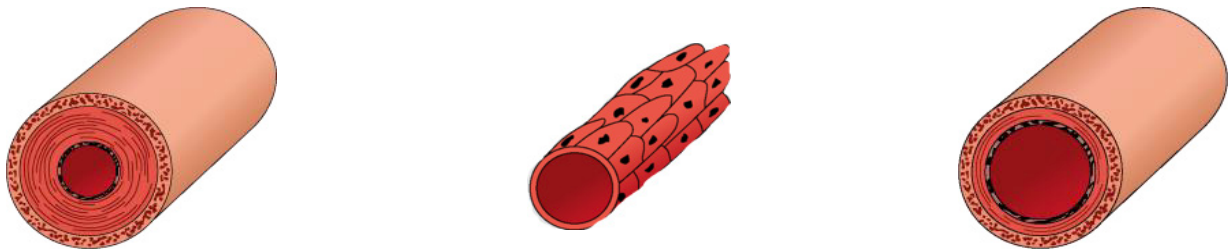


Circulatory system

- The circulatory system transports useful molecules and waste around the body. The human circulatory system consists of the heart, blood and blood vessels.
- The heart has four chambers: two atria and two ventricles.
- Valves ensure blood flows in the right direction.
- The septum separates the right and left sides of the heart.



The heart pumps oxygenated blood from the lungs to the body and deoxygenated blood from the body to the lungs (double circulatory system).

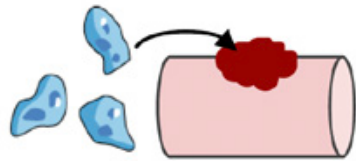


| Arteries                                                                                                                                                                          | Capillaries                                                                                                                                                                                                | Veins                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Blood taken away from heart</li> <li>• High pressure blood</li> <li>• Thick muscular and elastic walls</li> <li>• Small lumen</li> </ul> | <ul style="list-style-type: none"> <li>• Exchange substances between blood and cells</li> <li>• Very low pressure blood</li> <li>• Very thin walls (one cell thick)</li> <li>• Very small lumen</li> </ul> | <ul style="list-style-type: none"> <li>• Blood brought back to heart</li> <li>• Low pressure blood</li> <li>• Thin walls</li> <li>• Large lumen</li> <li>• Valves prevent back flow</li> </ul> |

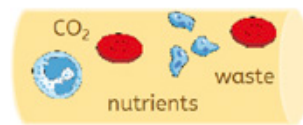


## Circulatory system (continued)

Blood is a fluid that transports substances, useful molecules and waste around the body. Blood helps the body to defend against diseases and to form scabs to heal cuts.



Platelets help with blood clotting for wound healing.



Plasma carries the other blood parts, nutrients, waste and carbon dioxide. It is yellow coloured and mostly water.



Red blood cells carry oxygen to all the cells of the body.



White blood cells help defend against disease

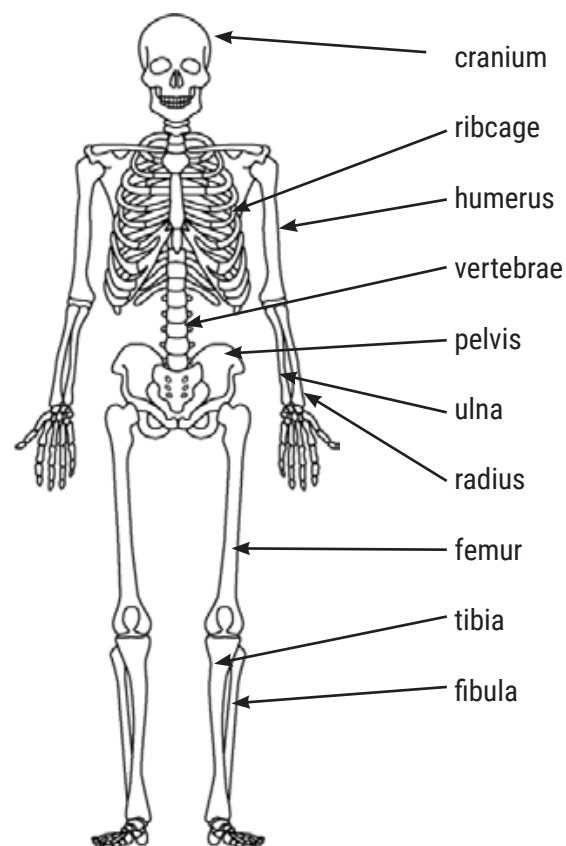
Adaptations of the red blood cells:

- biconcave shape → large surface area for faster oxygen diffusion
- contains haemoglobin → carry oxygen
- no nucleus → space for more haemoglobin → more oxygen

Red blood cells, white blood cells and platelets are made in the bone marrow - soft tissue inside large bones protected by the hard part of the bone around it.

## Skeletal system

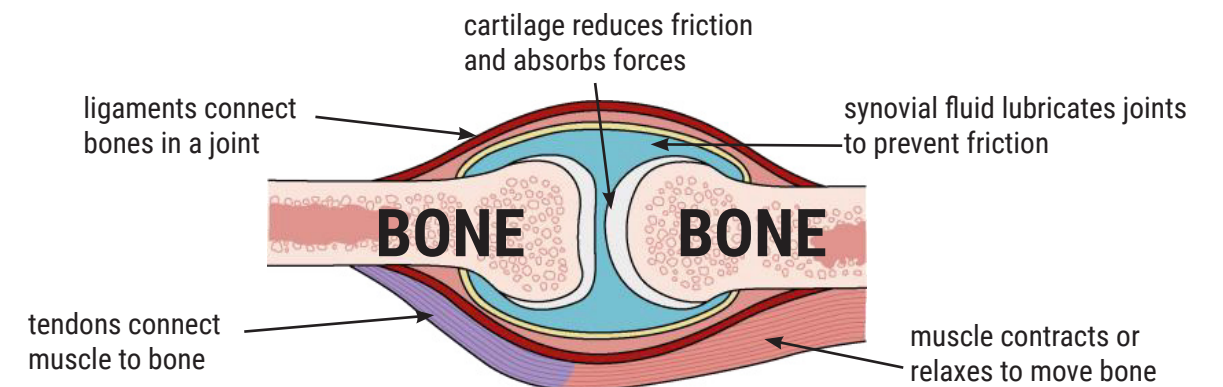
Four functions of the skeletal system are support, movement, making new blood cells and protection of organs (e.g. the cranium protects the brain and the ribcage protects the heart and lungs). Bones are living tissues that grow and change.



## Joints, muscles & movement

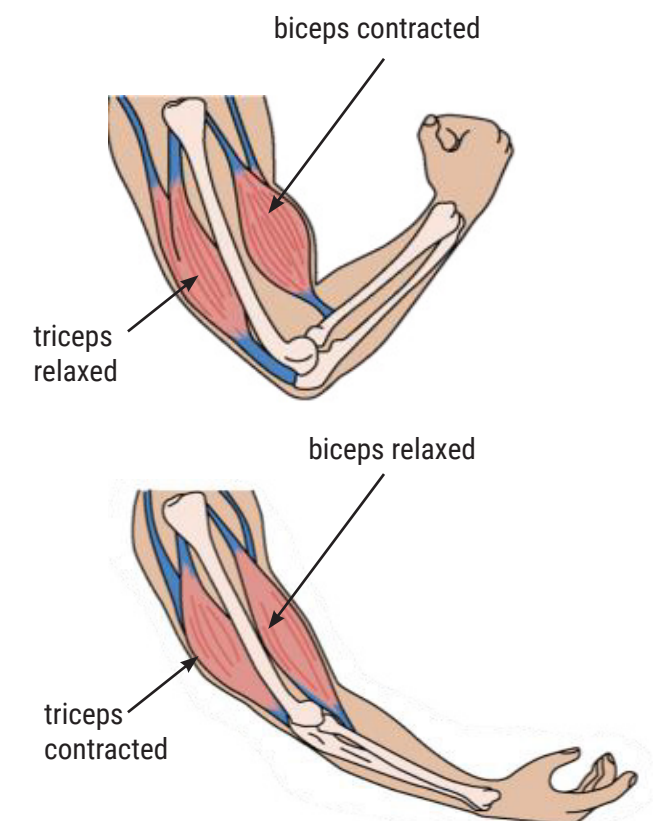
A joint is the point where two or more bones meet in the body. Joints connect bones and allow the body to move and bend. Different joint types allow various movements:

- **Hinge joint:** movement backwards and forwards e.g. the knees and elbows
- **Ball-and-socket joint:** movement in many directions e.g. the hips and shoulders
- **Pivot joint:** twisting movement around a fixed point e.g. the neck
- **Fixed joint:** does not allow for any movement e.g. in the cranium



Ageing can lead to joint wear, inflammation and arthritis. Arthritis causes joint pain and affects synovial fluid and cartilage.

- Muscles can only pull, they cannot push;
- Muscles work in antagonistic muscle pairs. When one muscle contracts to pull the bone in one direction, the other muscle relaxes to allow movement
- The way in which muscles and bones work together to exert forces is called biomechanics.
- Muscle strength varies based on muscle size, age, sex, training, nutrition and injury.



Questions

- 1. What is a multicellular organism?
- 2. Why can't multicellular organisms rely on diffusion alone?
- 3. What is the function of alveoli?
- 4. Why are alveoli efficient?
- 5. What moves air in and out of the lungs?
- 6. What is inhalation?
- 7. What is exhalation?
- 8. What is the function of the digestive system?
- 9. Where does absorption occur?
- 10. What is the function of the circulatory system?

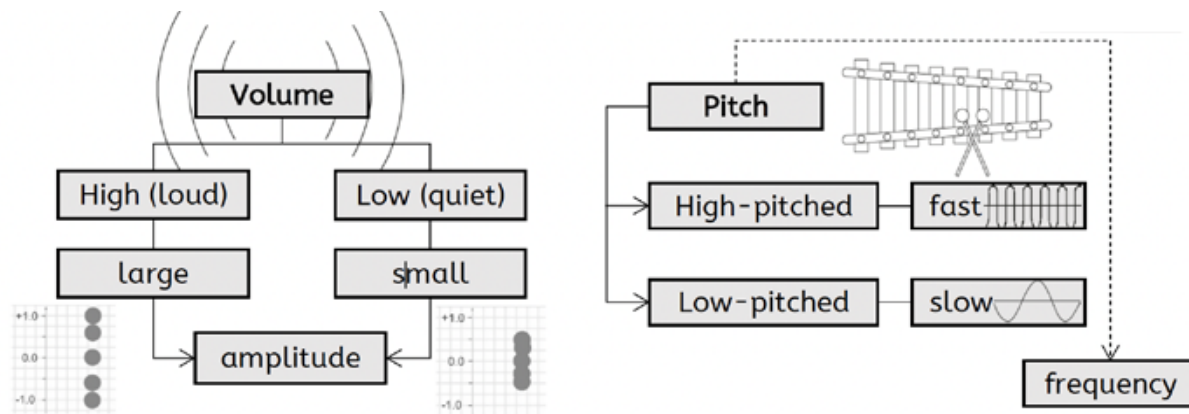
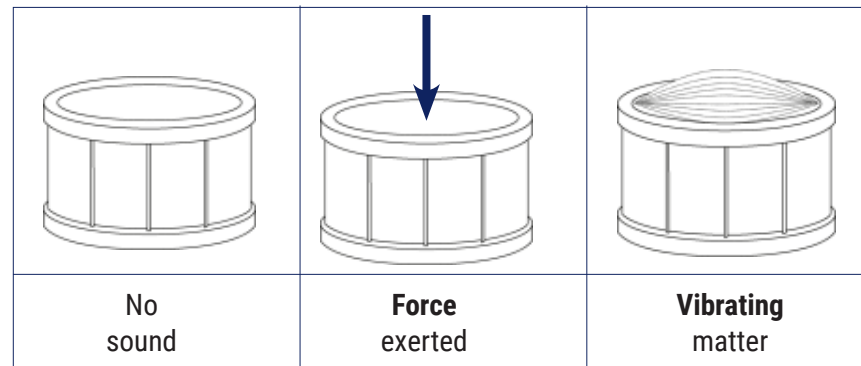
Questions

- 11. What does the heart do?
- 12. What do arteries do?
- 13. What do veins do?
- 14. What is the function of red blood cells?
- 15. What is the function of white blood cells?
- 16. What is the function of platelets?
- 17. What is the function of the skeleton?
- 18. What do muscles do?
- 19. What are antagonistic muscles?
- 20. What is a joint?



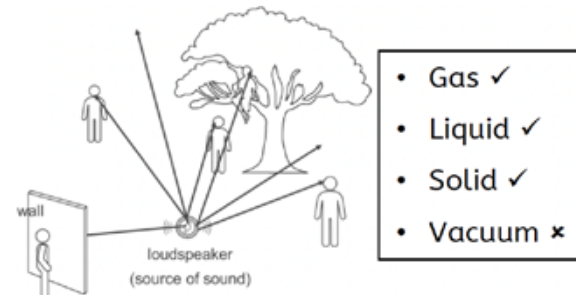
## Describing sound

### Sources of sound

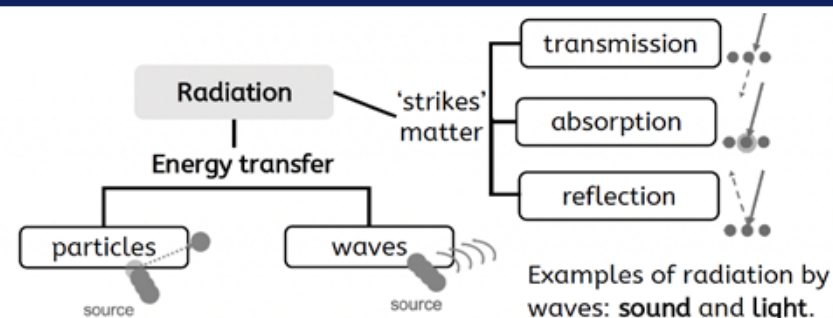


## Vibrations travel through matter

- Travel in all directions from a source.
- Can be observed by detectors placed at a distance.
- If blocked, a shadow region occurs.
- Fastest in solids, slowest in gases.

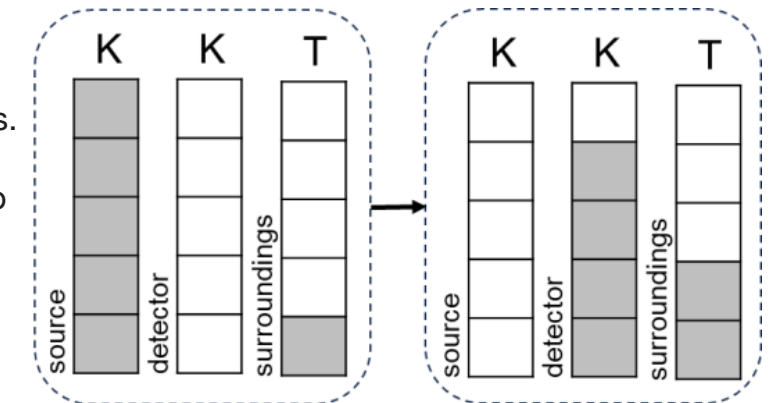


## Radiation



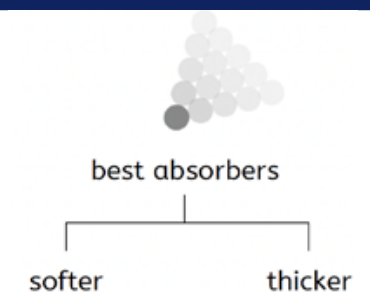
## Energy transfer

- As vibrations travel, the energy store of the source decreases.
- The energy store of the matter increases.
- The kinetic store of any detector increases.
- By the mechanical pathway.
- The thermal store of the surroundings also increases.



## Vibrations get less with distance

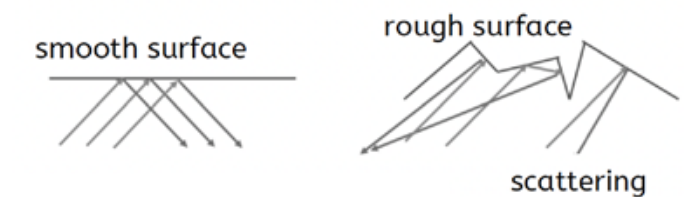
- Energy spreads out among more particles.
- Each particle absorbs some energy, not passing it all on.
- If all energy is absorbed, a shadow region occurs.



## Reflections

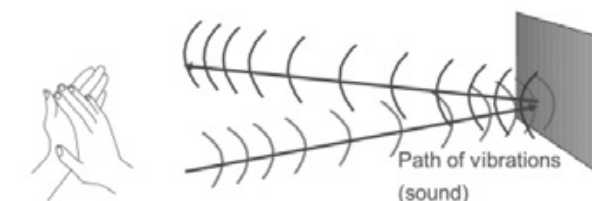
### Surfaces

- Smooth surfaces can build noise.
- Rough surfaces scatter sound so that it spreads out and quietens.
- Noise can be made worse by many reflections interacting, and better by using rough surfaces.



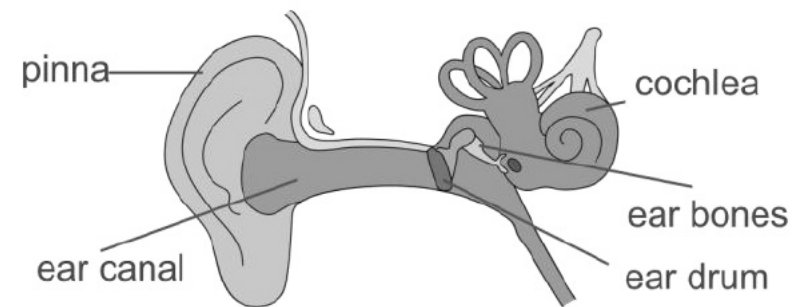
### Echoes

- A reflected sound is an echo.
- Some animals use echoes.



## Hearing

### The ear



### Sound in the ear

- The function:
  - transfer energy** to the nervous system, as much as possible
  - from the vibrations in the air
  - to the inner ear,
  - so that the brain can perceive and interpret it.
- Energy transfer from the tiny hairs in the cochlea to the nerves is by the **electrical** pathway.

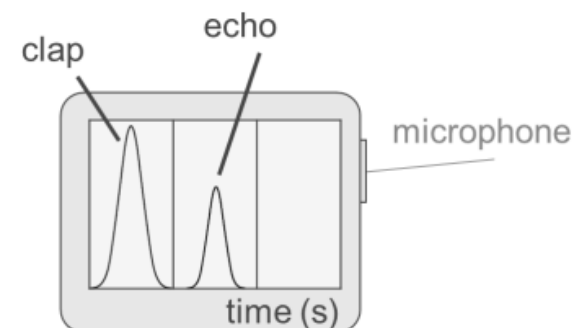
### Differences in hearing

- The **audible range** of human hearing is from about 20 Hz to 20 000 Hz.
- Above this is **ultrasound** and below this is **infrasound**.
- Different animals have different ranges of hearing.
- Exposure to loud sounds and ageing can contribute to hearing differences, e.g. deafness.

## Using technology to improve data quality

### Measuring short times

- Digital** clock reduces systematic error (no scale).
- Datalogging** equipment:
  - reduces difficulty observing quiet sounds e.g. echoes
  - reduces difficulty judging when sound arrives (measures directly)
  - reduces reflex action delays
  - allows 'zoom in' on time scale.



## Using scientific knowledge

### Echolocation

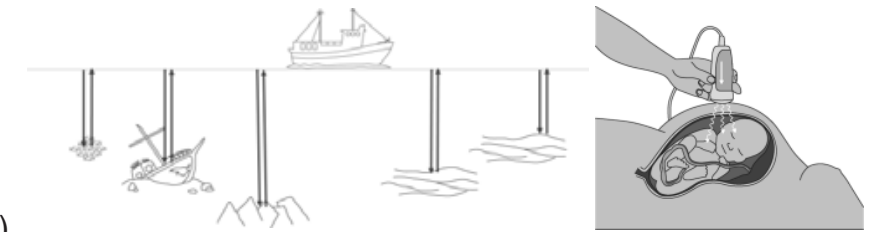
- Finding an object

### Acoustic imaging

- Deep in the sea
- Inside living organisms (foetal scan)
- Inside solid objects

### Hearing technology examples

- Hearing aids
- Hearing implants
- Hearing loops



We have more information, of better quality, with much less risk.

Reduce the chance of hearing damage by wearing ear protection and reducing volume of sounds.

## Observing by measurement

### Quantities: and their units

Base quantities: length (m), mass (kg), time (s), temperature (K).

Derived quantities include force (N), **frequency (Hz)**, **loudness (dB)**.

### Measuring instruments

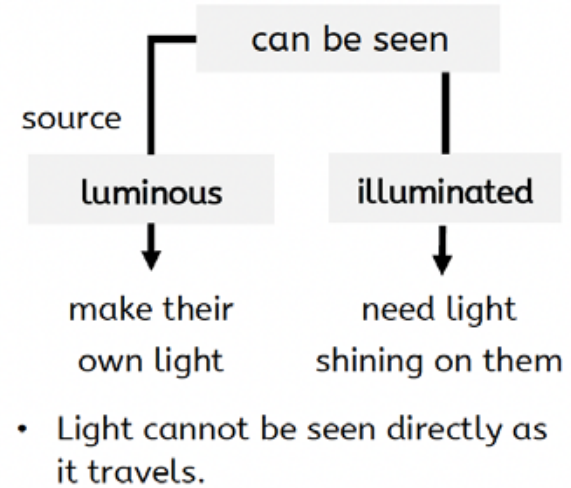
- Include rulers, balances, clocks and thermometers.
- Measuring tapes are used to measure distances longer than a few metres.



### Unit prefixes

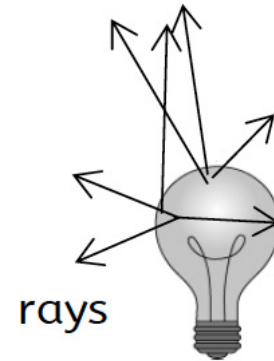
- Standard prefixes change a number by multiples of 1 000, e.g. one kilometre is equal to 1000 metres.
- The prefix milli- uses a multiple of 0.001, it means one thousandth:
  - one millisecond is one thousandth of a second (1 ms is easier to use than 0.001 s).
- A non-standard but common prefix is centi-, to mean one hundredth.
  - one centimetre is one hundredth of one metre (1 cm is easier to use than 0.001 m).

## Describing light



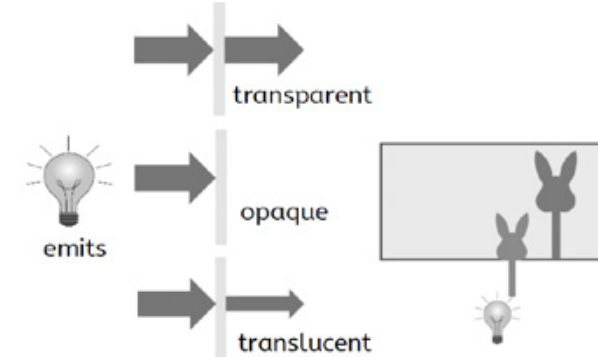
## Light travels

- away from source
  - from every point
  - in all directions
  - very fast
- Light is constantly emitted from a source that is 'on'.
- Light fills an enclosed space. Darkness is the absence of light.



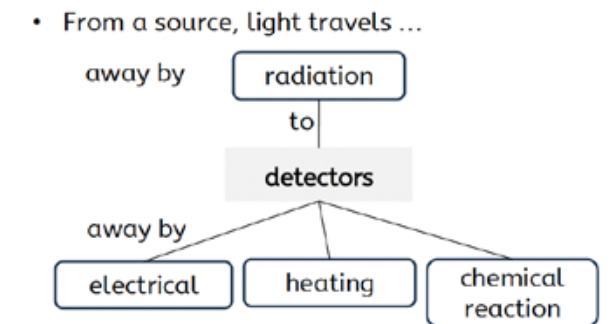
## Different media

- Light is transmitted through any transparent media, including a vacuum.

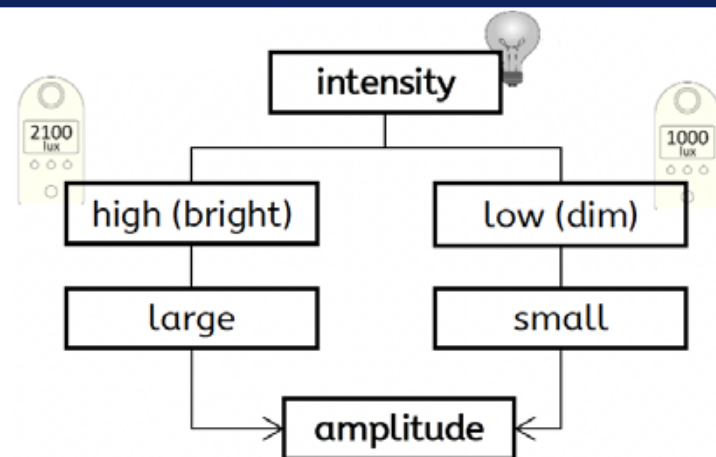


- All materials absorb some energy from light.
- Opaque objects transmit nothing (forming shadows).

### Energy pathways

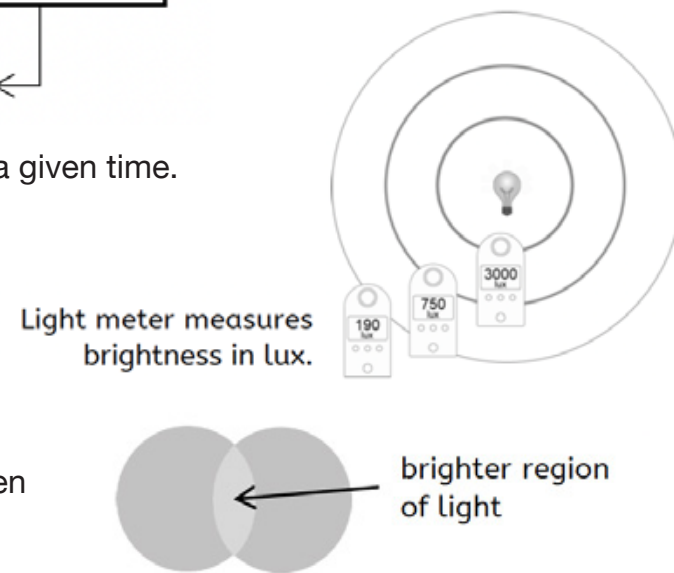


## Brightness



Some sources transmit more energy away in a given time.

- Light spreads out from a source.
- Brightness decreases with distance.



- Light from multiple sources falling on a screen is brighter than one

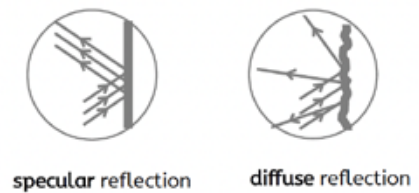
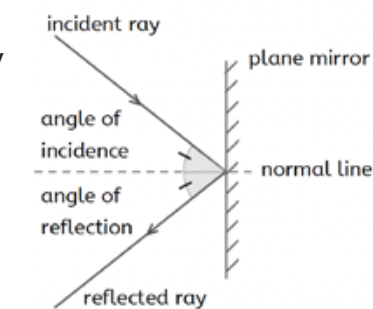
Light is the transfer of energy by the radiation pathway to its surroundings, so that a region is lit up.

## Light reflecting and refracting

### Reflection

- All surfaces reflect light and obey the **law of reflection**.

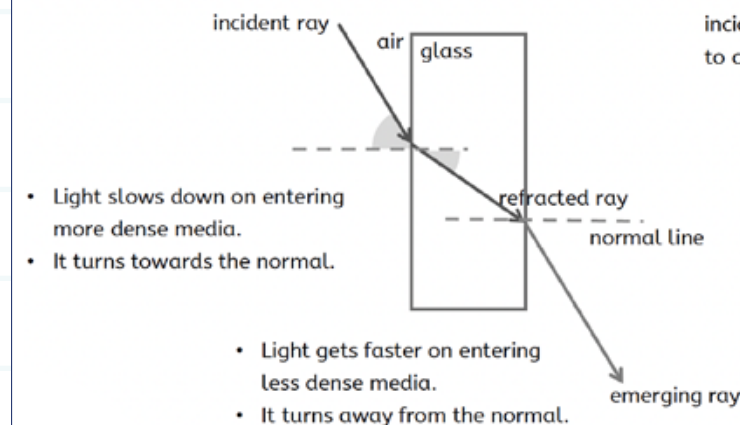
the angle of incidence = the angle of reflection



- Most surfaces reflect light **diffusely** (scatter it).

### Refracting

As the angle of incidence increases there is more refraction.

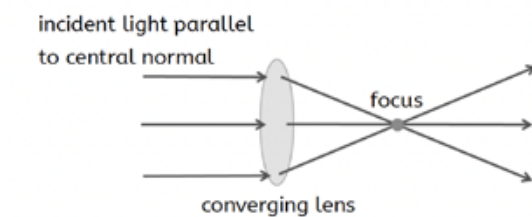


- Light slows down on entering more dense media.
- It turns towards the normal.

- Light gets faster on entering less dense media.
- It turns away from the normal.

### Lenses

Converging lenses form a focus and can form a clear image.

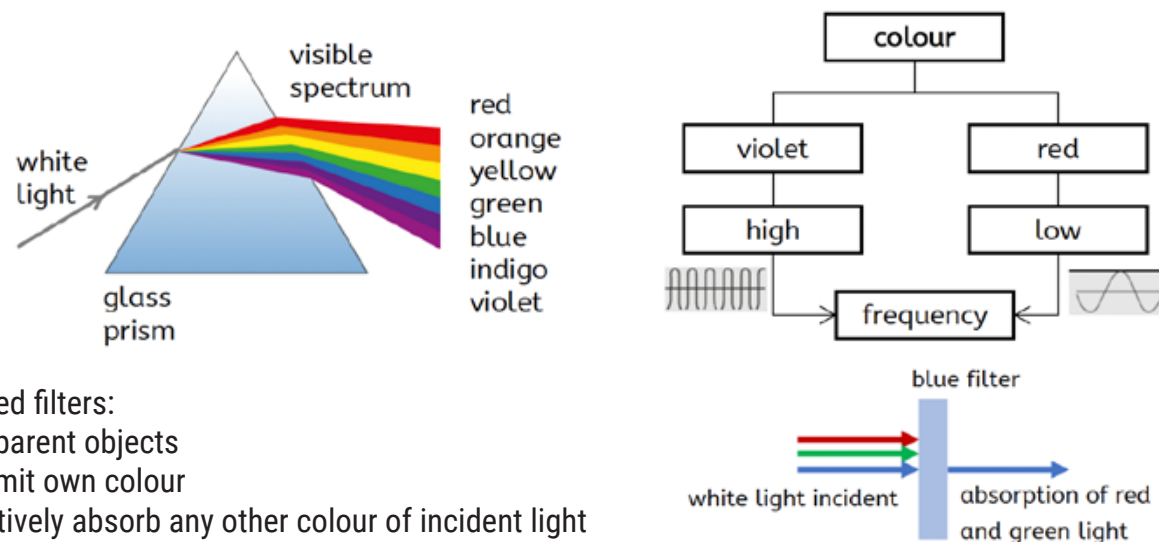


- The focal length is the distance from lens to focus, or lens to image.
- Thicker lenses (more curved) refract more, have a closer focus and longer focal length.



## Coloured light

- Luminous objects emit light of particular colours.
- Most common sources emit white light.

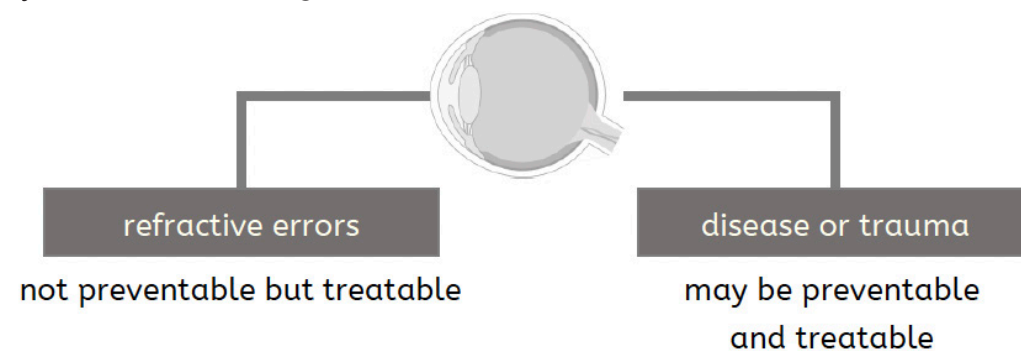


Coloured filters:

- transparent objects
- transmit own colour
- selectively absorb any other colour of incident light

## Seeing differences

Many problems with our vision are caused by parts of the eye that are not the right **shape** or **size**, that have become **cloudy**, or due to **cell damage**.



People with low vision may use:

Long canes, guide dogs, talking books, Braille or other assisted devices.



Light from the Sun can be dangerous:

- Never look directly at the Sun.
- Wear sunglasses in bright sunlight.
- Protect the skin too.

## Images

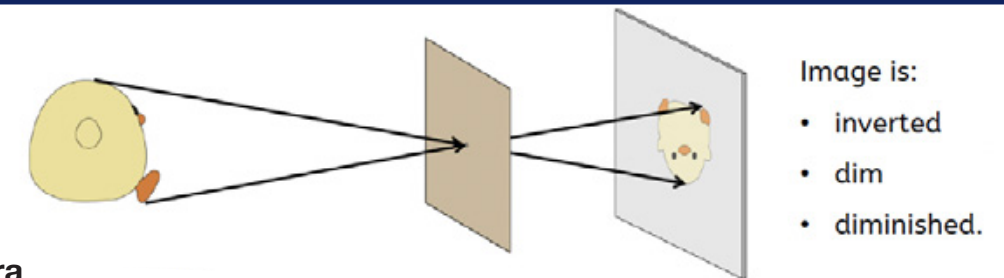


Image is:

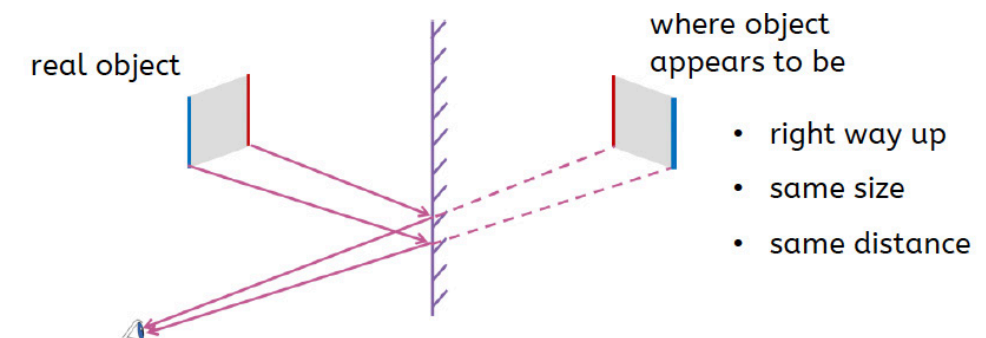
- inverted
- dim
- diminished.

### Pinhole camera

- Some light from each point of the object passes through the pinhole.
- The pinhole only allows a narrow beam through from each point.
- Light from each point crosses over as it passes through the pinhole.
- Light from every point falls on the screen forming a complete image.

### Mirror image

- Light from every point of the real object reflects into the eye.
- The brain interprets reflected light as originating from behind the mirror.



### Images from lenses

- Some light from each point refracts through the lens.
- Light from each point arrives at specific points on the surface forming an image.

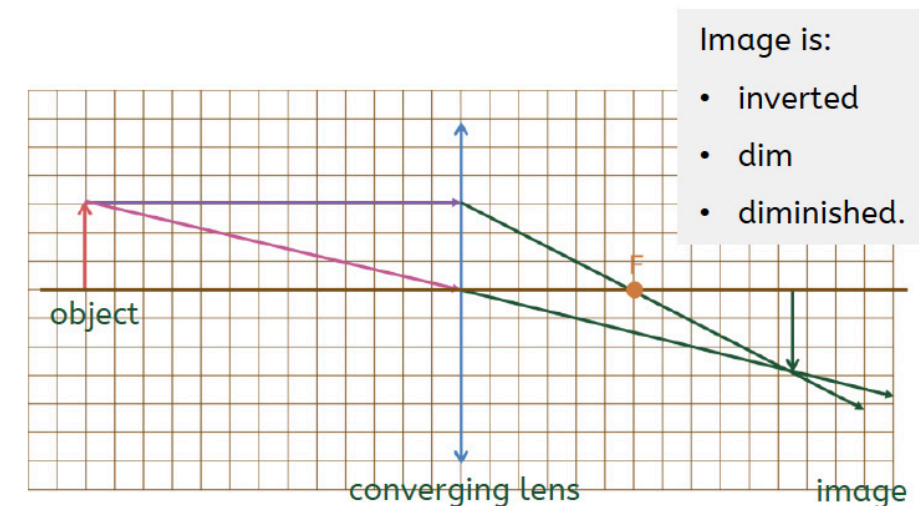
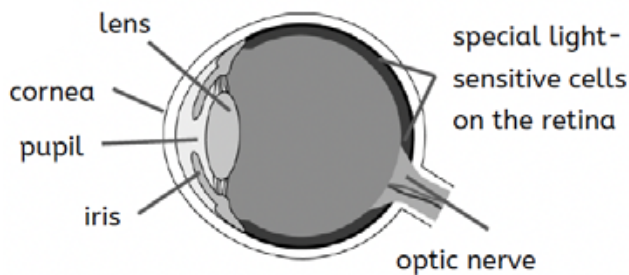


Image is:

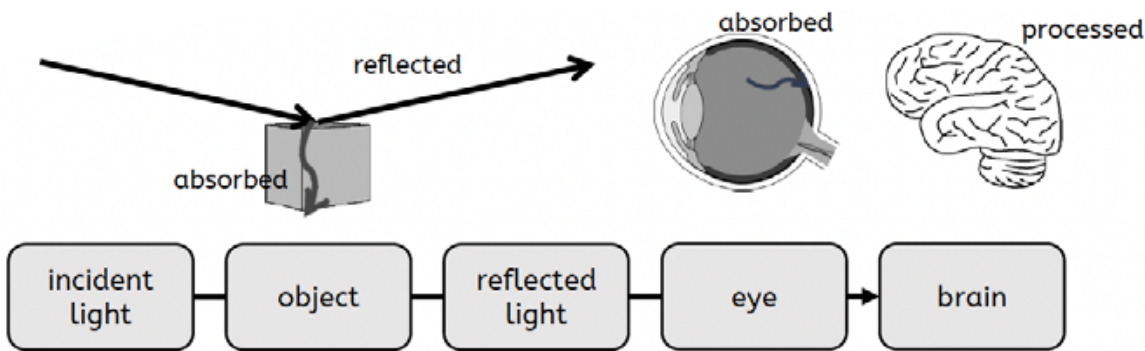
- inverted
- dim
- diminished.

The human eye



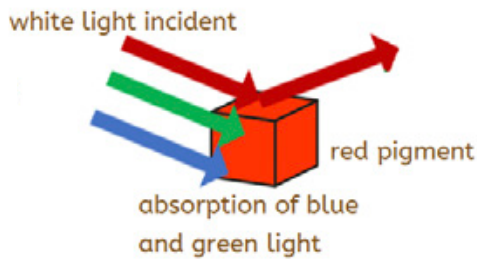
|             |                                         |
|-------------|-----------------------------------------|
| cornea      | refracts light before it enters the eye |
| iris        | controls the size of the pupil          |
| pupil       | lets light enter the eye                |
| lens        | refracts light to form an image         |
| retina      | made up of cells that detect light      |
| optic nerve | carries electrical signals to the brain |

Seeing objects

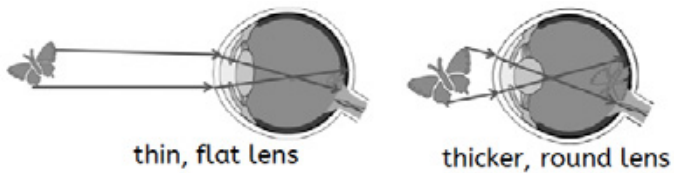


Seeing coloured objects

- If an opaque object is coloured, it has pigments which absorb specific colours.
- absorbs any colour not in the pigment
- appears the colour of any scattered light



Seeing at different distances



Refraction errors of the eye

short-sightedness

- eye too long or the cornea too extended: focus in front of retina
- Glasses to spread out the light before it enters the eye.



long-sightedness

- eye too too short or the cornea too rounded: focus behind the retina
- Glasses to converge the light before it enters the eye.



Scientific models

Representations of reality that can be used to explain observations

The ray model of light

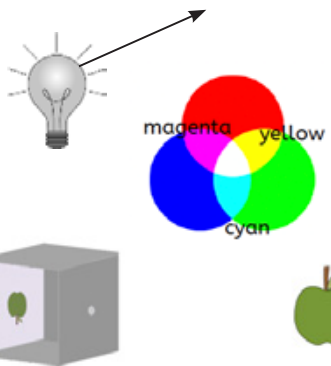
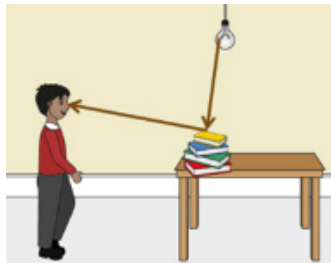
- Rays are imaginary lines, drawn to represent the path light is travelling.
- From an infinite number, a few are chosen to be drawn.

The ‘passive-eye’ model of vision

- Objects emit or reflect light into the eye.

The ‘three primary colours’ model of human colour vision

- The eye has three types of sensor cell.
- It detects red, green and blue - the primary colours of light.
- When directed at a white screen, combinations of primary colours can appear as secondary colours or white (and more).



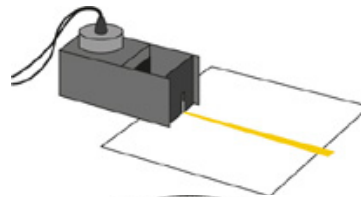
The pinhole camera as a model for the eye

- Light enters through the pinhole similar to the pupil.
- Light ‘crosses over’ at the pinhole, similar to the lens.
- Light from the object falls on the screen, similar to the back of the eye.

Observing light

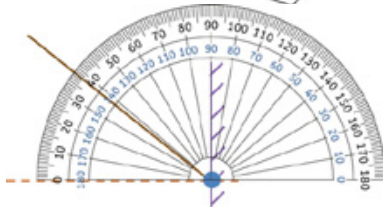
Using a raybox

- The raybox and comb are connected to a power supply.
- Draw crosses (avoiding likely measurement errors).
- Plot and label rays.



Measuring angles

- Place the centre at the vertex.
- The scale starts at 0° on the normal line.
- Read up from 0°.



Trusted scientific research

High-quality data

- Well-chosen method
- Appropriate resolution
- Multiple measurements
- Repeatable
- Reproducible
- Appropriate range
- Systematic intervals

Trustworthy conclusions

Process and display collected data

Describe data from table or chart

Explain interpreted data



Questions

1. What produces sound?
2. What is pitch?
3. What determines pitch?
4. What is volume?
5. What determines volume?
6. Can sound travel in a vacuum?
7. Where does sound travel fastest?
8. What is an echo?
9. What do smooth surfaces do to sound?
10. What do rough surfaces do to sound?

Questions

11. What is the range of human hearing?
12. What is ultrasound?
13. What type of energy transfer is sound?
14. What happens to sound energy as it travels?
15. What happens when sound is blocked?
16. What structure converts vibrations into signals in the ear?
17. What is the unit of frequency?
18. Name one hearing technology.
19. What is echolocation?
20. How can hearing damage be reduced?

Scientific methods

Scientists use a scientific method to collect high-quality data to explain observations and answer questions. A scientist might choose any of the four scientific methods:

- Testing a hypothesis by changing variables e.g. smoother surfaces cause less friction to act on objects sliding over them.
- Testing a hypothesis without changing variables e.g. as age increases, the likelihood of developing arthritis increases.
- Experimenting by changing variables without testing a hypothesis e.g. testing different elements to classify them as metals or non-metals.
- Observing phenomena without changing variables or testing a hypothesis e.g. biologists observing cells or astronomers observing planets.

Measurement error

Random error is a measurement error that arises unpredictably from the experimental environment and cannot be controlled. As it is unpredictable, random error cannot be removed or corrected.

But the impact of random error can be minimised by taking multiple measurements, ignoring any anomalies and calculating a mean.

Conclusions

It is important that a conclusion is based on the observed data and trends without making over-generalisations that extend beyond the scope of the experiment. This makes the conclusion more reliable. E.g. when testing polymer strengths, a statement such as “polymer C is always stronger than polymer B” would be an over-generalisation.

Developing technology through scientific knowledge

Scientific advances have enabled workers in Science, Technology, Engineering, and Mathematics (STEM) fields) to further technology and industry by developing new tools and machines, and by making the production of goods in large quantities possible.

For example, being able to create new composite materials such as fibreglass has led to their use for car body panels, and these are mass produced, made in large quantities, every day.

Developing scientific knowledge through technology

Technology developments have allowed scientists to learn more about materials.

| Technology                               | What it allows scientists to do                                |
|------------------------------------------|----------------------------------------------------------------|
| Electron microscope                      | See the structure of materials down to the level of each atom. |
| Computer simulations                     | Simulate how ceramics behave under different conditions.       |
| Three-dimensional (3D) printing machines | Quickly produce prototypes and test new ceramic designs.       |

Advancements in technology have improved scientific research by providing scientists with many ways of collecting high-quality data and communicating.

- Computer simulations allow scientists to test materials under different conditions.
- Cloud-based platforms (online tools) allow scientists all over the globe to communicate and collaborate.

Questions

- 1. What is a material?
- 2. What is an example of a natural material?
- 3. What is an example of a synthetic material?
- 4. What are ceramics?
- 5. What is one property of ceramics?
- 6. What is the main weakness of ceramics?
- 7. What is a polymer?
- 8. What is a monomer?
- 9. What is polymerisation?
- 10. What is the source of most synthetic polymers?

Questions

- 11. What is one property of polymers?
- 12. What is one environmental issue with polymers?
- 13. What is recycling?
- 14. What is a composite material?
- 15. What is an example of a composite?
- 16. Why are composites used?
- 17. What is a property of reinforced concrete?
- 18. What affects the properties of a composite?
- 19. What does an electron microscope do?
- 20. What is a raw material?

## Life cycles

Reproduction is the process of making new living organisms known as offspring, which happens at some point in an organism's life cycle.

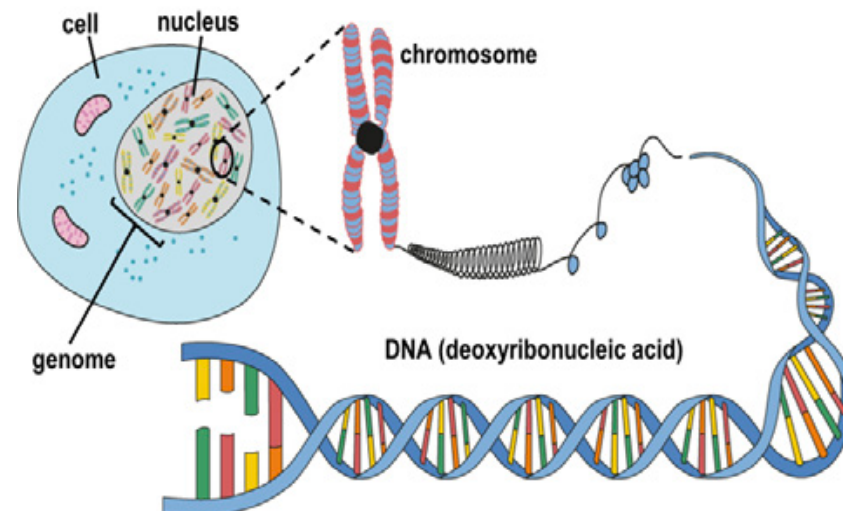
- Offspring inherit characteristics from both parents through their genomes, which contain the complete set of genetic information.
- Offspring usually look similar but not identical to their parents because they inherit half of their genome from each parent.

## Genome, Chromosomes, DNA and Genes

The genome is made of a chemical substance called DNA.

- DNA is a natural polymer and has two strands that are connected across the middle and twisted to form a double helix structure.
- DNA is coiled into structures called chromosomes, which are stored in the nucleus in plant and animal cells.
- Different organisms have different numbers of chromosomes.
- Human body cells each contain 23 pairs of chromosomes, half of which are from each parent.
- Each chromosome is divided into sections of DNA called genes.
- The hierarchy in size order from smallest to largest is: gene → DNA → chromosomes → genome.
- All the DNA in a cell, packed into chromosomes and made up of genes, together forms the cell's genome.

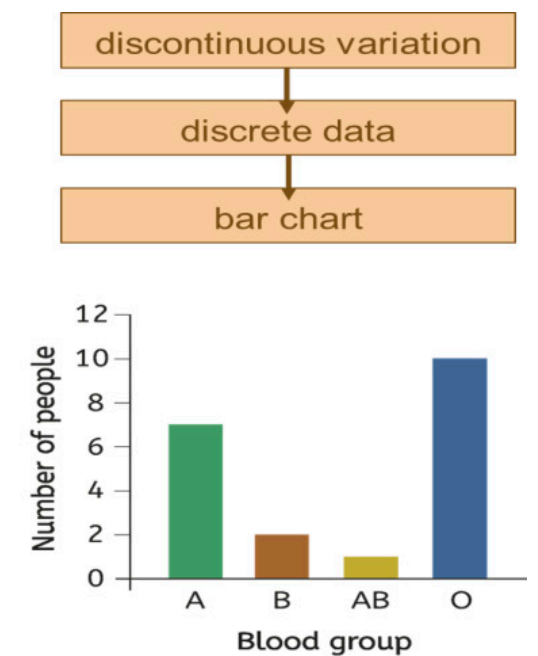
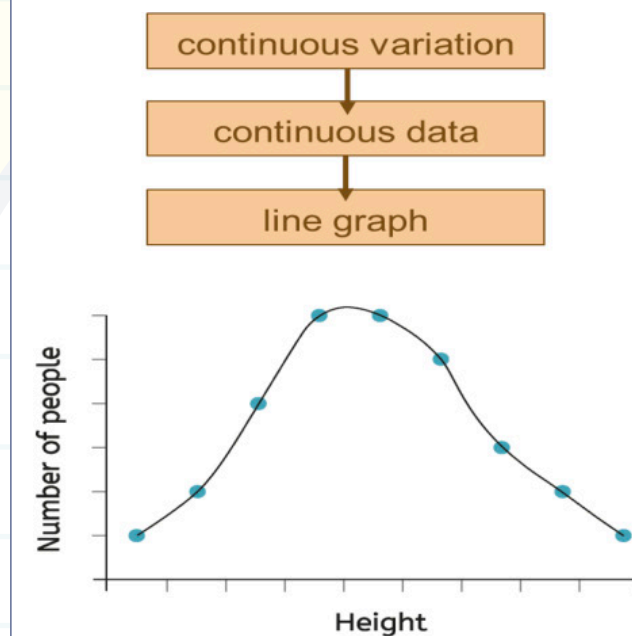
Scientific methods led to the discovery of DNA's structure in the 1950s. Rosalind Franklin's X-ray images revealed its spiral form, which helped Watson and Crick determine the double helix structure.



## Variation

A species is a group of organisms that can reproduce with each other to produce offspring that are fertile.

- Variation is the differences between organisms of the same species.
- Genetic variation is caused by an offspring's inherited genome.
- Environmental variation is caused by an organism's environment or by an organism's lifestyle.
- Variation within a species is important for adaptation and survival.
- Discontinuous variation is variation that can be classified into specific categories (e.g. eye colour, blood type, rolling tongue, shoe size).
- Continuous variation is variation that can have a range of values (e.g. body mass, plant height, hand span, foot length).
- Discontinuous variation tends to be determined by a single gene or just a few genes. Continuous variation tends to be determined by many genes and the environment.
- Data on continuous and discontinuous variation can be classified as quantitative, including discrete (whole numbers, counted) and continuous (measured values), or qualitative, which consists of categorical data (descriptive labels).

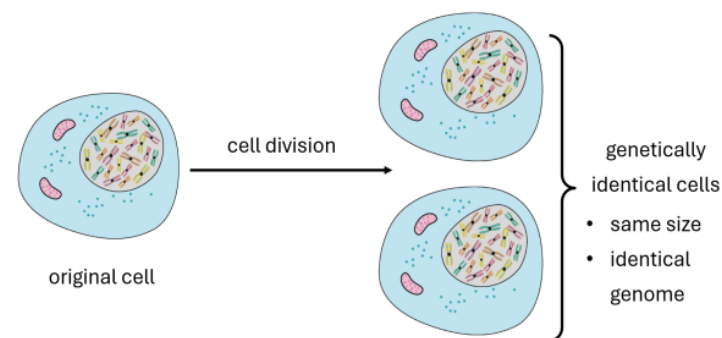


## Growth and Development

In multicellular organisms, growth is when an organism increases the number of cells it has.

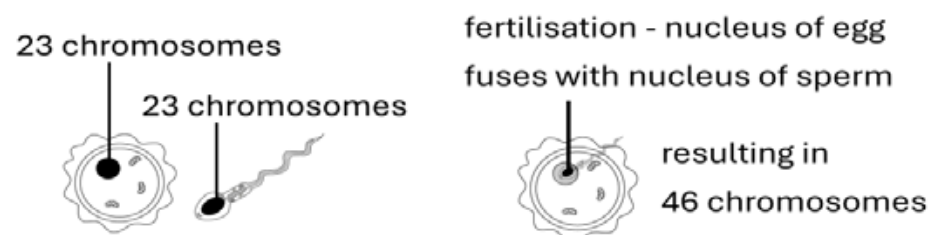
When multicellular organisms grow, new cells are made from existing cells by:

- cell enlargement – the cell gets bigger.
- cell division – the cell divides to form two genetically identical cells.



As an organism develops, specialised cells are created to carry out specific functions.

## Sexual Reproduction and Fertilisation in Humans

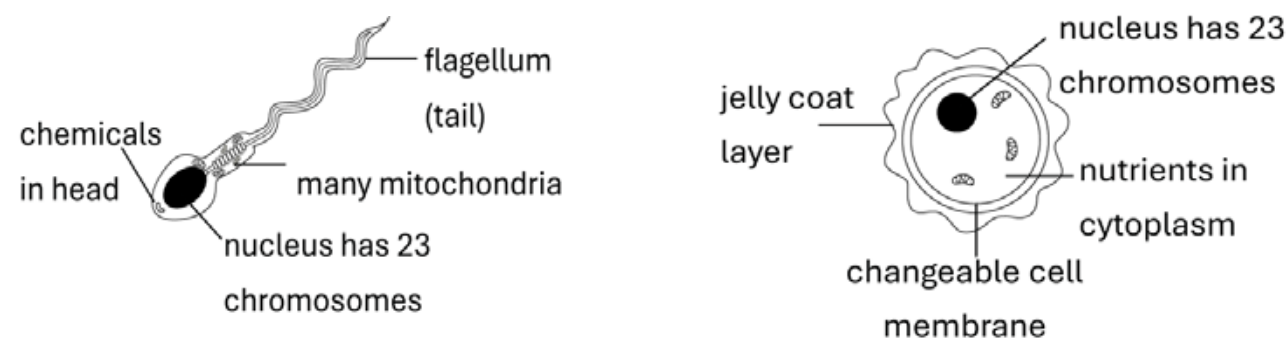


Technological advances like digital microscopes allow scientists to capture high-resolution images and videos of eggs, sperm, and the zygote during cell division.

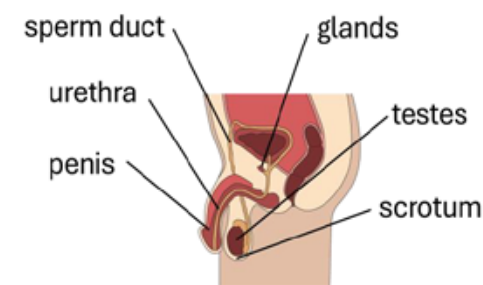
Fertilisation happens if the egg cell meets and joins with a sperm cell in the oviduct. The fertilised egg (zygote) attaches to the lining of the uterus (implantation).

- The sperm and egg each contain 23 single chromosomes.
- The fertilised egg (zygote) has 23 pairs of chromosomes.
- During fertilisation, the genomes of both parents combine. This creates genetic variation.

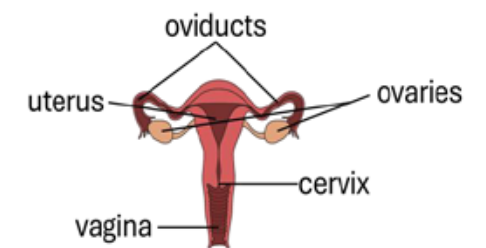
## Gamete Adaptations (Egg and Sperm)



## Male and Female Reproductive Systems



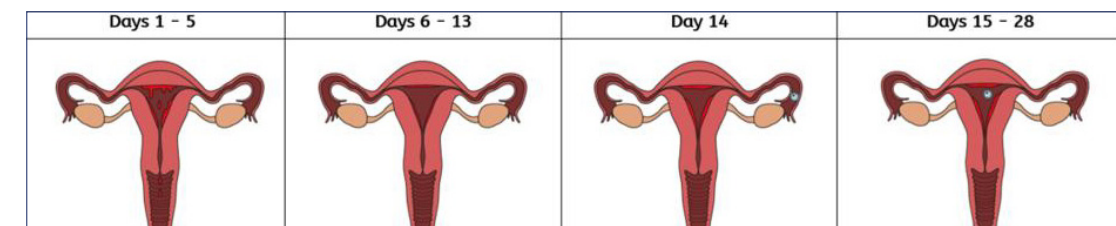
- testes – make sperm
- scrotum - holds the testes at the right temperature
- sperm duct – carries sperm from the testes
- glands – produce fluid that mixes with the sperm
- urethra – carries semen (and urine)
- penis - where semen (containing sperm) leaves the body



- ovaries - release eggs
- oviducts - carry the egg from the ovaries to the uterus
- uterus - where the baby develops
- vagina - sperms enters and the baby is pushed out
- cervix – ring of muscle

## Puberty and the Menstrual Cycle

- Adolescence is a period of emotional and physical changes known as puberty.
- Puberty affects both males and females, with some changes specific to each sex.
- Both males and females experience changes such as underarm and pubic hair growth, increased body odour, emotional changes, and a faster growth rate.
- Males also go through voice deepening, enlargement of the testes and penis, sperm cell production, shoulder and chest widening, and facial and chest hair growth.
- Females develop breasts, start ovulating and having menstrual cycles, and experience hip widening.
- The menstrual cycle is an approximately 28-day, hormone regulated process that prepares the female body for pregnancy, although some women may have cycles ranging from 21 to 35 days. The menstrual cycle begins at puberty, stops during pregnancy, and ceases completely after menopause, typically around age 50.



**Days 1 – 5:** Menstruation occurs as the uterus lining breaks down and is lost.

**Days 6 – 13:** The uterus lining builds up and thickens.

**Day 14:** Ovulation occurs and an egg is released from the ovary

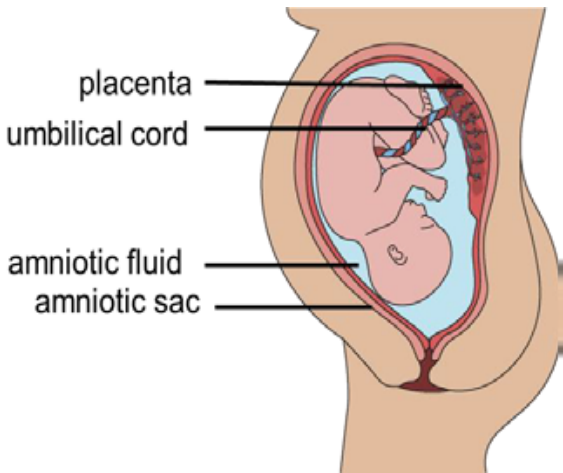
**Days 15-28:** If the egg is fertilised, the uterus lining is maintained for implantation. If the egg is not fertilised, the cycle continues.



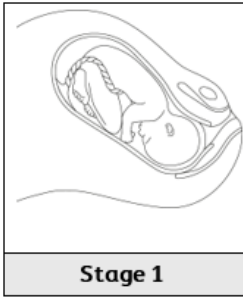
Pregnancy and Foetal Development

Fertilisation → Zygote → Embryo → Foetus → Baby → Birth

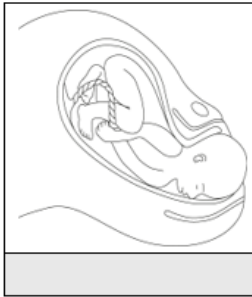
- A foetus develops in the uterus.
- The foetus relies on its mother for:
  - protection against bumps and temperature changes;
  - oxygen for respiration;
  - nutrients (food and water).
- The foetus also needs its waste substances to be removed.
- The foetus is protected by the uterus and the amniotic fluid, contained in the amniotic sac.
- The placenta provides oxygen and nutrients, and removes waste (e.g. carbon dioxide) by diffusion of these substances between the mother's blood and the foetus' blood.
- The umbilical cord joins the placenta to the foetus and transfers substances between the two.
- Substances like alcohol, cigarette chemicals, and drugs can cross the placenta by diffusion, affecting the developing baby.



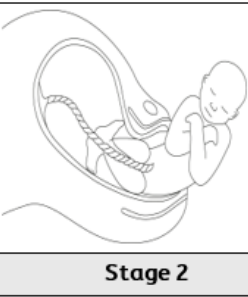
Pregnancy and Foetal Development



Stage 1  
Uterus contracts and the cervix opens wider



Stage 2  
Uterus contractions become stronger, and the baby is pushed out head first. The umbilical cord is cut.

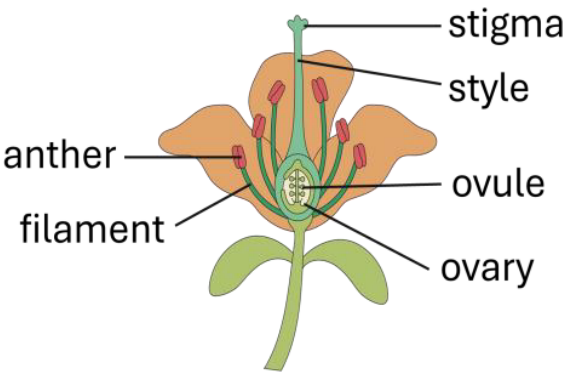


Stage 3  
Uterus muscles contract and the placenta is pushed out of the vagina.

Plant Reproductive System and Pollination

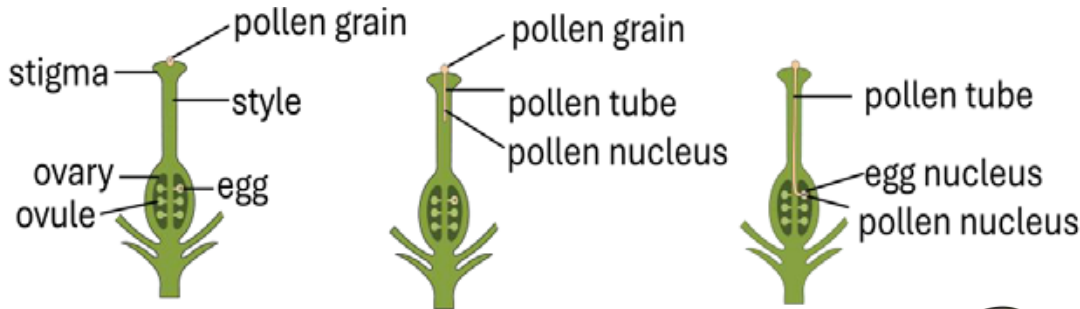
Pollen grains need to move from the anther of one flower to the stigma of another flower. This is called pollination. Plants can be pollinated by wind or pollinators (e.g. bees).

| Name of structure | Male or female? | Function                          |
|-------------------|-----------------|-----------------------------------|
| stigma            | female          | catches the pollen (it is sticky) |
| style             | female          | connects the stigma to the ovary  |
| ovule             | female          | produces the eggs                 |
| ovary             | female          | contains the ovules               |
| anther            | male            | produces pollen                   |
| filament          | male            | holds up the anther               |

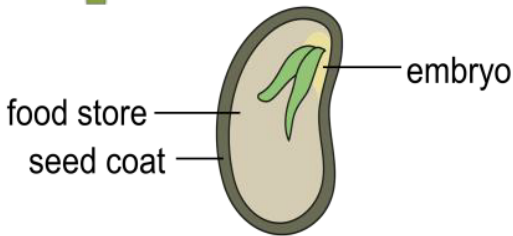


Fertilisation and Germination in Plants

Pollen grains land on the stigma and grow a pollen tube that delivers the pollen nucleus to the egg nucleus inside the ovule. A zygote is formed, which develops into an embryo.



- The ovule thickens and hardens to form the seed.
- The seed coat protects the developing embryo.
- The food store provides nutrients for the developing embryo.
- The ovary matures to form the fruit.



- Germination is the development of a plant from a seed.
- Water, oxygen and a suitable temperature are needed for a seed to germinate.
- During germination, the seed absorbs water and swells, causing the hard seed coat to split. The roots grow downwards, and shoots start to grow upwards. The first leaf starts to appear, and more leaves follow.



## Seed Dispersal

- Seeds must be dispersed from each other and from the parent to reduce competition for light, water, space and soil minerals.
- **Wind** - Seeds are light and have a large surface area from hairs or a winged structure (e.g. dandelion, maple).
- **Animals** - Brightly coloured and tasty fruits are eaten by animals and seeds are deposited in their waste (e.g. berries, tomato). Animals also collect and bury seeds (e.g. acorn). Seeds can also attach to the animal's surface.
- **Explosion** – Seeds are contained in a pod that bursts open when ripe, throwing the seeds away from the plant (e.g. pea pod).

## Asexual Reproduction

- Some plants reproduce asexually, creating identical offspring without pollination. Methods include runners, bulbs and tubers, resulting in clones that have the same genome and characteristics as the parent plant.
- Unicellular organisms, like bacteria, also reproduce asexually by copying their genome before dividing into two genetically identical cells.
- Sexual reproduction promotes genetic variation, enhancing adaptation and disease resistance. Asexual reproduction allows rapid population growth but lacks diversity, making populations vulnerable to environmental changes.

Questions

1. What is reproduction?

2. What is a genome?

3. What is DNA?

4. What is a chromosome?

5. What is a gene?

6. What is variation?

7. What is genetic variation?

8. What is environmental variation?

9. What is a species?

10. What is fertilisation?

Questions

11. What is a zygote?

12. Where does a foetus develop?

13. What is the function of the placenta?

14. What is puberty?

15. What is the length of the menstrual cycle?

16. What is pollination?

17. What is germination?

18. What conditions are needed for germination?

19. What is asexual reproduction?

20. What is sexual reproduction?



**YEAR 7**

# History



EMPIRES EAST AND WEST C.1000

NORMAN CONQUEST

MEDIEVAL RELIGION

MEDIEVAL MONARCHS

MALI

EUROPEAN RENAISSANCE

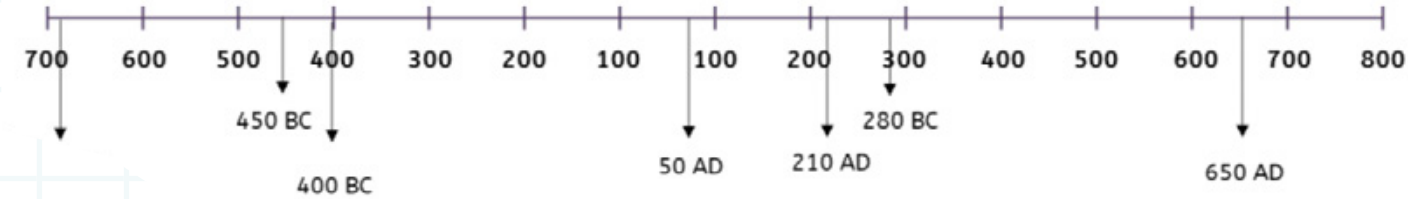


Key Vocabulary

|                   |                                                                                                         |
|-------------------|---------------------------------------------------------------------------------------------------------|
| <b>Apothecary</b> | A person who in the past made and sold medicines.                                                       |
| <b>Astronomy</b>  | The study of space, stars and planets.                                                                  |
| <b>Caliph</b>     | The ruler of the Islamic Empire.                                                                        |
| <b>Dynasty</b>    | A sequence of rulers from the same family.                                                              |
| <b>Empire</b>     | A group of countries ruled by a single ruler.                                                           |
| <b>Innovation</b> | Improving something or creating something that is a new technology.                                     |
| <b>Madrasa</b>    | Muslim school or college.                                                                               |
| <b>Migration</b>  | The movement of people from one place to another.                                                       |
| <b>Monarch</b>    | A king or queen.                                                                                        |
| <b>Pilgrim</b>    | A person who makes a journey, often a long and difficult one, to a special place for religious reasons. |

Chronology

|                     |                                                                      |
|---------------------|----------------------------------------------------------------------|
| <b>A chronology</b> | (n) the arrangement of events, or dates, in the order of occurrence. |
| <b>B millennium</b> | (n) a period of 1,000 years.                                         |
| <b>C century</b>    | (n) a period of 100 years.                                           |
| <b>D decade</b>     | (n) a period of 10 years.                                            |



Place

The Silk Road was an important trading route for spices, silk and knowledge. The Silk Road connected China with European countries.



Themes and Threads

|                         |                                                                                                                                                                                                                                                                                                                |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power</b><br>        | <p>The control a person or group has in a country.</p> <p>For example, powerful empires which existed c.1000 held power through emperors, empresses and caliphs.</p> <p><i>This includes threads such as warfare and empire.</i></p>                                                                           |
| <b>Identity</b><br>     | <p>The qualities and characteristics that make a person who they are and what they value as important.</p> <p>For example, religious beliefs such as Buddhism, Islam and Christianity influenced empires and individuals c.1000.</p> <p><i>This includes threads such as women and beliefs.</i></p>            |
| <b>Connectivity</b><br> | <p>The act of joining or being linked to somewhere, someone or something else.</p> <p>For example, people, knowledge and beliefs travelled across continents using trade routes, such as the Silk Roads.</p> <p><i>This includes threads such as migration, trade, innovation, medicine and knowledge.</i></p> |



Questions

1. What is an apothecary?

2. What is astronomy?

3. What was a caliph?

4. What is a dynasty?

5. What is an empire?

6. What does innovation mean?

7. What is a madrasa?

8. What is migration?

9. What is a monarch?

10. What is a pilgrim?

Questions

11. What is chronology?

12. What is a millennium?

13. What is a century?

14. What is a decade?

15. What was the Silk Road?

16. What does 'power' mean in history?

17. Who held power around c.1000?

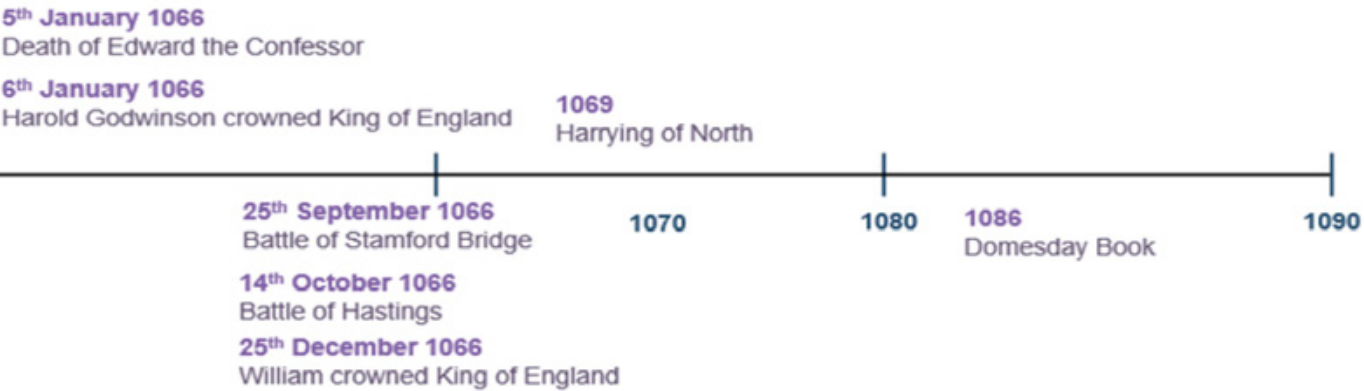
18. What does 'identity' mean?

19. How did religion influence empires around c.1000?

20. What does 'connectivity' mean?

Key Vocabulary

|               |                                                                                |
|---------------|--------------------------------------------------------------------------------|
| archer        | (n) the movement of people from one place to another.                          |
| cavalry       | (v) to enter an area by force to take control.                                 |
| claimant      | (n) the order of taking over an official title or position.                    |
| conquer       | (n) to receive something from a person who has died.                           |
| coronation    | (n) a person who believes they have a right to something.                      |
| feudalism     | (n) a promise witnessed by God.                                                |
| Harrying      | (n) a child born to parents who are not married.                               |
| illegitimate  | (v) to take control of a place or people by force.                             |
| infantry      | (n) a group of soldiers who fight on horses.                                   |
| inherit       | (n) a person who shoots with a bow and arrow                                   |
| invade        | (n) Soldiers who fight on foot.                                                |
| oath          | (n) a ceremony where the new monarch is crowned.                               |
| primogeniture | (n) a simple castle with a man-made hill surrounded by a clear defensive area. |
| succession    | (v) to repeatedly attack somewhere or something.                               |



Place

This unit will focus on England.  
The UK was formed in 1801 under the Act of Union.



Themes and Threads

|                         |                                                                                                                                                                                                                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power</b><br>        | The control a person or group has in a country.<br><br>For example, the monarch held complete control and needed a clear line of succession to avoid foreign claims to the throne.<br><br><i>This includes threads such as succession, warfare. Protest and class systems.</i> |
| <b>Identity</b><br>     | The qualities and characteristics that make a person who they are and what they value as important.<br><br>For example, the Normans promoted Christianity in England.<br><br><i>This includes threads such as women and beliefs.</i>                                           |
| <b>Connectivity</b><br> | The act of joining or being linked to somewhere, someone or something else.<br><br>For example, England was made up of many diverse groups who migrated before 1066.<br><br><i>This includes threads such as migration and medicine.</i>                                       |

Questions

1. What is an archer?

2. What is cavalry?

3. What is a claimant?

4. What does conquer mean?

5. What is a coronation?

6. What is feudalism?

7. What does “harrying” mean?

8. What does illegitimate mean?

9. What is infantry?

10. What does inherit mean?

Questions

11. What does invade mean?

12. What is an oath?

13. What is primogeniture?

14. What is succession?

15. What does ‘power’ mean in this topic?

16. Why was succession important for monarchs?

17. What does ‘identity’ mean?

18. How did the Normans influence identity in England?

19. What does ‘connectivity’ mean?

20. Why was England diverse before 1066?

| Key Vocabulary  |                                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------|
| Church          | (n) The institution of the Christian Church, including all the people who ran it and all the individual churches. |
| church          | (n) A Christian place of worship.                                                                                 |
| clergy          | (n) Officials of the Church led by the pope.                                                                      |
| excommunication | (n) Power of the pope to expel someone from the Church.                                                           |
| laity           | (n) Ordinary people who attend church but do not hold official religious positions.                               |
| martyr          | (n) A person who suffers or is killed because of their religious or political beliefs.                            |
| mass            | (n) Religious service on a Sunday that worshippers were expected to attend.                                       |
| monastery       | (n) A building in which monks live and worship.                                                                   |
| persecution     | (n) Unfair or cruel treatment over a long period of time because of race, religion or beliefs.                    |
| pilgrimage      | (n) A journey typically taken to a site of religious importance.                                                  |
| purgatory       | (n) A place where an individual's soul stayed until all their sins had been forgiven.                             |
| relic           | (n) Part of a saint's body or something they owned which was believed to have the power to perform miracles.      |

| Themes and Threads                                                                                          |                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power</b><br>         | <p>The control a person or group has in a country.</p> <p>For example, the Church had their very own hierarchy comprised of the pope, arch-bishop, bishops, priests, monks and nuns.</p> <p><i>This includes threads such as warfare and protest.</i></p>                                                                                         |
| <b>Identity</b><br>      | <p>The qualities and characteristics that make a person who they are and what they value as important.</p> <p>For example, while Christianity (Catholicism) was the most common religion in medieval England, people following other faiths lived in England at this time too.</p> <p><i>This includes threads such as the role of women.</i></p> |
| <b>Connectivity</b><br> | <p>The act of joining or being linked to somewhere, someone or something else.</p> <p>For example, Jews migrated to England in 1070, invited by William I.</p> <p><i>This includes threads such as trade and medicine.</i></p>                                                                                                                    |

Church hierarchy



Questions

1. What is the Church (capital C)?

2. What is a church (lowercase c)?

3. Who are the clergy?

4. What is excommunication?

5. Who are the laity?

6. What is a martyr?

7. What is mass?

8. What is a monastery?

9. What is persecution?

10. What is a pilgrimage?

Questions

11. What is purgatory?

12. What is a relic?

13. What does 'power' mean in medieval religion?

14. Who was at the top of the Church hierarchy?

15. Name two other roles in the Church hierarchy.

16. What does 'identity' mean?

17. What was the main religion in medieval England?

18. Did only Christians live in medieval England?

19. What does 'connectivity' mean?

20. Who migrated to England in 1070 and why is this important?



Key Vocabulary

|                    |                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------|
| baron              | (n) a person who held land or property given by the monarch or a powerful overlord.     |
| challenge          | (n) to make a rival claim or to threaten someone's hold on a position.                  |
| dynastic           | (adj) relating to a line of rulers from the same family.                                |
| heresy             | (n) a belief that goes against the teachings of the Church                              |
| male primogeniture | (n) the practice of giving the inheritance to the eldest son in the family.             |
| miasma             | (n) the idea that disease is caused by foul smelling air.                               |
| monarch            | (n) king or queen.                                                                      |
| resistance         | (n)he refusal to accept or obey something.                                              |
| revolt             | (n) often a violent and sudden resistance which is short-lived.                         |
| seige              | (n) military act of surrounding a city or base, attacking it, and cutting off supplies. |

Key dates

|         |                                             |
|---------|---------------------------------------------|
| 1135-53 | The Anarchy                                 |
| 1170    | Murder of Thomas Becket                     |
| 1154    | Eleanor becomes Queen of England and France |
| 1209    | King John excommunicated                    |
| 1215    | Magna Carta                                 |
| 1265    | Creation of Parliament under Henry III      |
| 1381    | Peasants' Revolt                            |
| 1455-87 | Wars of the Roses                           |

Themes and Threads

Power



The control a person or group has in a country.

For example, the power of the monarch was challenged during the Peasants’ Revolt in 1381.

*This includes threads such as class systems (feudal system), succession (male primogeniture), protest and democracy (Magna Carta)*

Identity



The qualities and characteristics that make a person who they are and what they value as important.

For example, the role of women such as Eleanor of Aquitaine who played an active role as Queen.

*This includes threads such as the role of women and beliefs.*

Connectivity



The act of joining or being linked to somewhere, someone or something else.

For example, the Black Death arrived in England in 1348 and there were several ideas about the causes of the disease and how to treat it.

*This includes threads such as medicine.*

Chronology



Questions

- 1. What is a baron?
- 2. What does challenge mean?
- 3. What does dynastic mean?
- 4. What is heresy?
- 5. What is male primogeniture?
- 6. What is miasma?
- 7. What is a monarch?
- 8. What does resistance mean?
- 9. What is a revolt?
- 10. What is a siege?

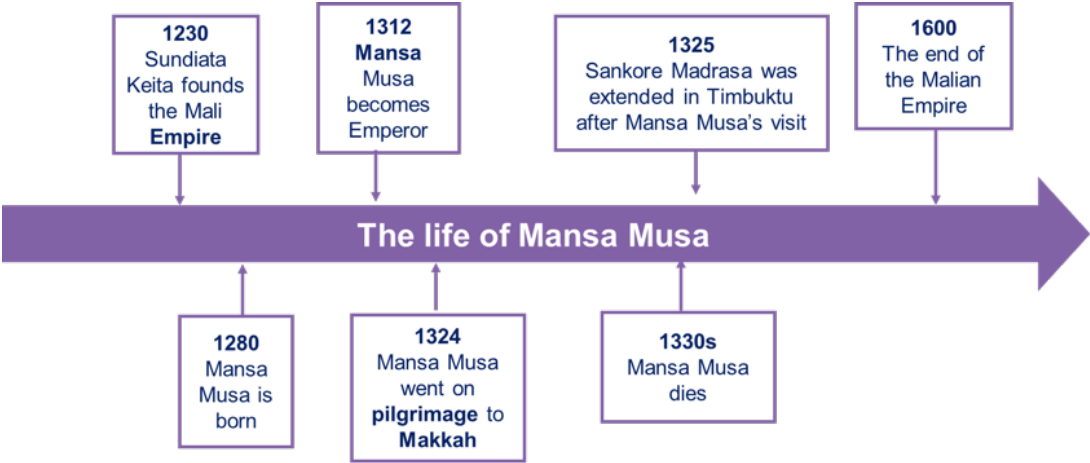
Questions

- 11. What was the Anarchy (1135–53)?
- 12. What happened in 1170?
- 13. What important event happened in 1215?
- 14. What happened in 1265?
- 15. What happened in 1381?
- 16. What does ‘power’ mean?
- 17. How was monarchy power challenged in 1381?
- 18. What does ‘identity’ mean?
- 19. Give an example of identity in this topic.
- 20. Who was Henry II’s queen and ruled in his absence?

Key Vocabulary

|                |                                                                                                   |
|----------------|---------------------------------------------------------------------------------------------------|
| 1. Annexation  | (n) To add conquered territory to your own territory.                                             |
| 2. Caravan     | (n) A group of people, travelling together across a desert in Asia or North Africa.               |
| 3. Diplomatic  | (adj) Being careful not to hurt someone's feelings.                                               |
| 4. Divine      | (adj) Like a God.                                                                                 |
| 5. Empire      | (n) A group of countries ruled by a single ruler.                                                 |
| 6. Enslaved    | (v) To force someone to remain in a conditions such as slavery.                                   |
| 7. Griot       | (n) People in West Africa who passed on their society's history through stories, poems and music. |
| 8. Legacy      | (n) How someone or something is remembered.                                                       |
| 9. Makkah      | (n) The holy city of Islam in Saudi Arabia.                                                       |
| 10. Mansa      | (n) King of the Mali Empire.                                                                      |
| 11. Merchant   | (n) Someone who buys goods and sells them for a profit.                                           |
| 12. Pilgrimage | (n) A journey typically taken to a site of religious importance.                                  |

Chronology



Place

The line on this modern map of West Africa shows the location of the Mali Empire.

The Mali Empire was located in West Africa and was richer than any European empire during the 13th – 16th centuries.



Themes and Threads

Power



The control a person or group has in a country.

For example, the Mali Empire was the wealthiest and largest empire in Africa. It expanded under Mansa Musa.

*This includes threads such as succession and empire.*

Identity



The qualities and characteristics that make a person who they are and what they value as important.

For example, Mansa Musa was a devout Muslim and wanted to spread Islam across the Empire.

*This includes threads such as beliefs and class systems.*

Connectivity



The act of joining or being linked to somewhere, someone or something else.

For example, the Mali empire was rich in gold and salt, which was used to trade with other empires.

*This includes threads such as trade and knowledge.*

Questions

1. What is annexation?

2. What is a caravan?

3. What does diplomatic mean?

4. What does divine mean?

5. What is an empire?

6. What does enslaved mean?

7. What is a griot?

8. What is a legacy?

9. What is Makkah?

10. What is a Mansa?

Questions

11. What is a merchant?

12. What is a pilgrimage?

13. What does 'power' mean in this topic?

14. Why was the Mali Empire powerful?

15. Who expanded the Mali Empire?

16. What does 'identity' mean?

17. How did Mansa Musa show his identity?

18. What does 'connectivity' mean?

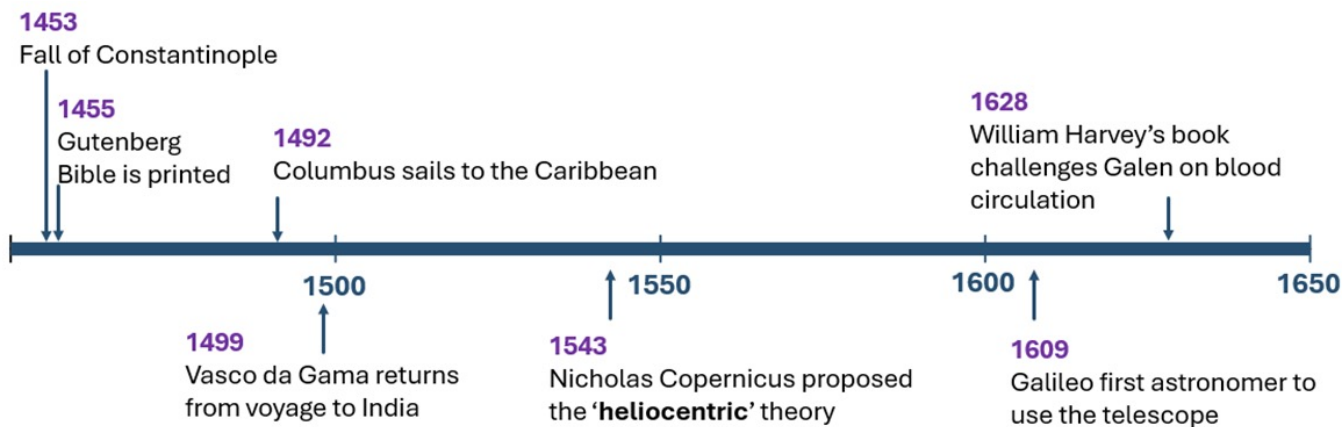
19. What goods made Mali wealthy in trade?

20. Where was the Mali Empire located and when was it rich?

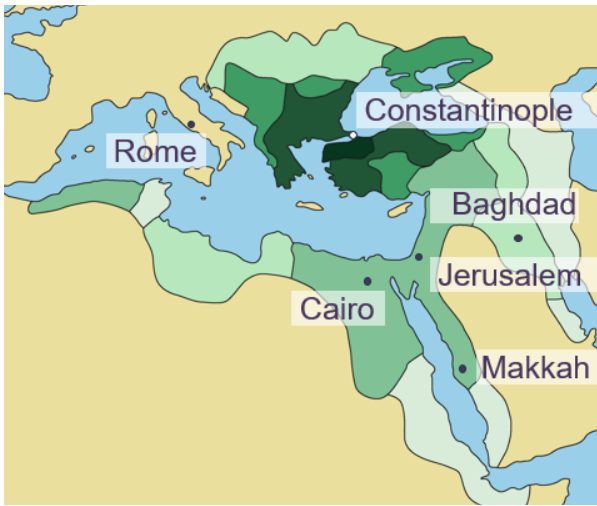
Key Vocabulary

|                  |                                                                                        |
|------------------|----------------------------------------------------------------------------------------|
| Absolute monarch | (n) when a ruler holds unlimited power.                                                |
| Anatomy          | (n) a branch of science that studies the body structure of humans and animals.         |
| Aristocrat       | (n) someone of high class.                                                             |
| Artillery        | (n) large guns that can fire across long distances.                                    |
| Bombardment      | (n) to attack with guns or canon fire.                                                 |
| Circumnavigate   | (v) to sail around the world.                                                          |
| Innovation       | (n) the process of improving something or creating something that is a new technology. |
| Invention        | (n) the creation of a new device, method or process.                                   |
| Janissary        | (n) an infantry unit made up of young Christian men.                                   |
| Musket           | (n) a long loading gun.                                                                |
| Physician        | (n) a highly educated and trained medical expert.                                      |
| Renaissance      | (n) the revival of art and learning in Europe 1300-1600                                |
| Republic         | (n) a form of government where power is held by elected individuals and not a monarch. |
| Voyage           | (n) a long journey.                                                                    |

Chronology



Place



Themes and Threads

Power



The control a person or group has in a country.

For example, the Ottoman empire was controlled by the Sultan who was an absolute monarch.

*This includes threads such as succession, warfare, empire and class systems.*

Identity



The qualities and characteristics that make a person who they are and what they value as important.

For example, during the Renaissance a new school of thought called humanism emerged.

*This includes threads such as the role of women and beliefs.*

Connectivity



The act of joining or being linked to somewhere, someone or something else.

For example, after the fall of Constantinople many scholars migrated to Italy.

*This includes threads such as migration and medicine.*



Questions

1. What is an absolute monarch?

2. What is anatomy?

3. What is an aristocrat?

4. What is artillery?

5. What is bombardment?

6. What does circumnavigate mean?

7. What is innovation?

8. What is an invention?

9. What was a Janissary?

10. What is a musket?

Questions

11. What is a physician?

12. What was the Renaissance?

13. What is a republic?

14. What is a voyage?

15. What does 'power' mean?

16. Who controlled the Ottoman Empire?

17. What does 'identity' mean?

18. What new idea developed during the Renaissance?

19. What does 'connectivity' mean?

20. Why did scholars migrate to Italy?



**YEAR 7**

# Geography



MAPS AND SYMBOLS

CONTINENTS, OCEANS AND COUNTRIES IN THE UK

CLIMATE CHANGE

RIVERS

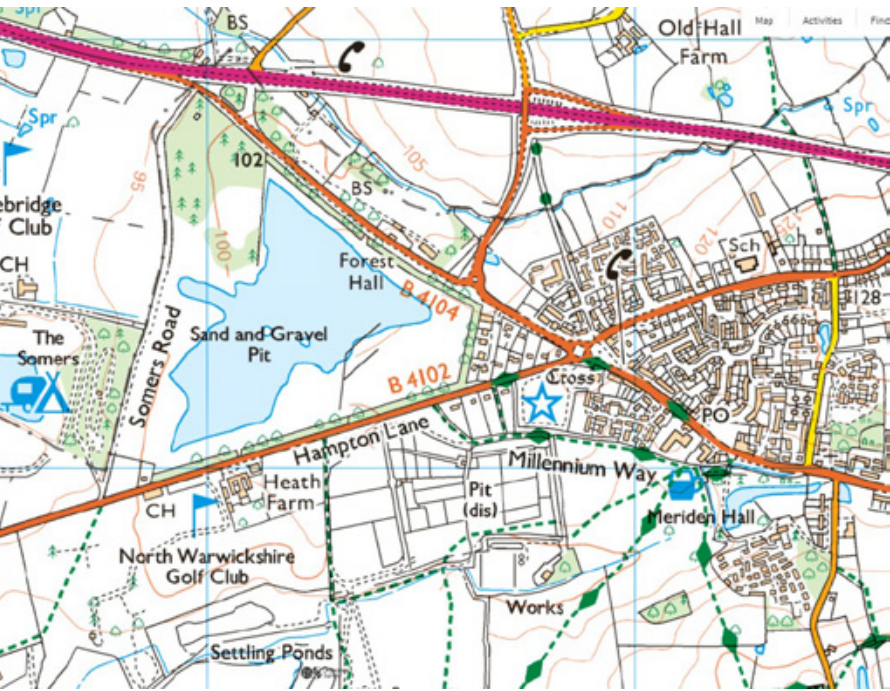
EMPLOYMENT

THE MIDDLE EAST

THE ENQUIRY PROCESS

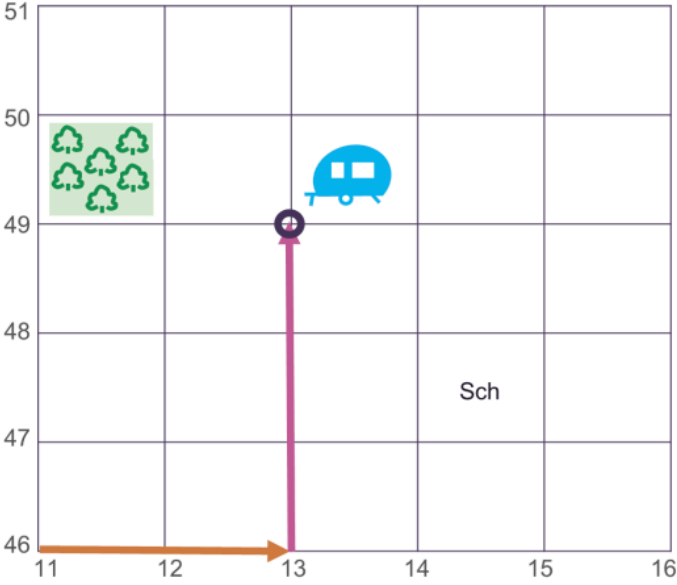


OS maps use symbols to show human and physical features. Maps have a **title**, **labels**, a **compass rose**, a **scale** and a **key**.



Four-figure grid references

- 1. Look at the bottom-left corner of the square.
- 2. Find the **easting**.
- 3. Find the **northing**.
- 4. Write down the four-figure grid reference.

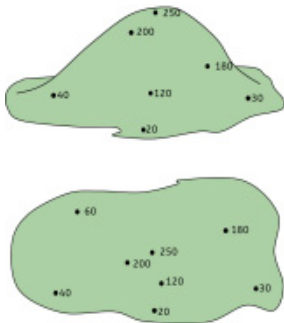


Key Vocabulary

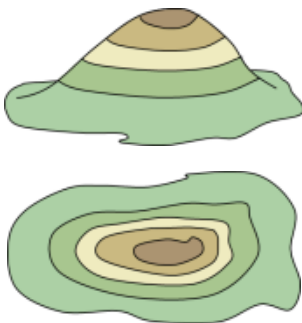
|               |                                              |
|---------------|----------------------------------------------|
| Continent     | One of the seven large land masses on Earth. |
| Eastings      | The grid reference along the bottom.         |
| Northings     | The grid reference up the side.              |
| Contour lines | Brown lines on a map that show height.       |
| Relief        | The height of the land.                      |
| Topography    | The shape and physical features of an area.  |
| Altitude      | Height above sea level (measured in metres). |
| OS map        | Ordnance Survey is a map of areas of the UK. |

Relief

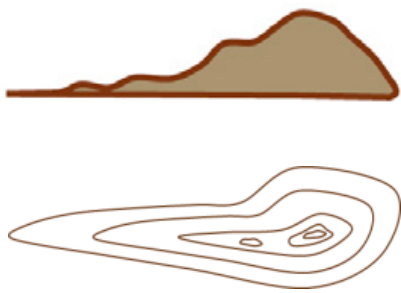
Height on a 2D map can be shown using three methods:



Spot heights – a dot giving the exact height of a specific point.



Colour layering - different heights are shown by bands of different colours.



Contour lines – brown lines connecting areas of the same height.

Maps and Symbols - Questions

1. What do geographers call a drawing of a particular area such as a city, country or continent represented on a flat surface?
2. What tool is used on a map to identify specific features or symbols?
3. What scale map would display continents and oceans?
4. What type of map does mountains appear on?
5. What are the five features a map needs?

Key Vocabulary - Questions

6. What is a continent?
7. What is altitude measured in?
8. What is topography?
9. What is relief?
10. What does OS stand for?

Four-figure grid references - Questions

11. Why do OS maps have grid squares?
12. On an OS map, what are the numbers of the vertical axis called?
13. On an OS map, what are the numbers on the horizontal axis called?
14. What is the main rule to remember when reading grid references?

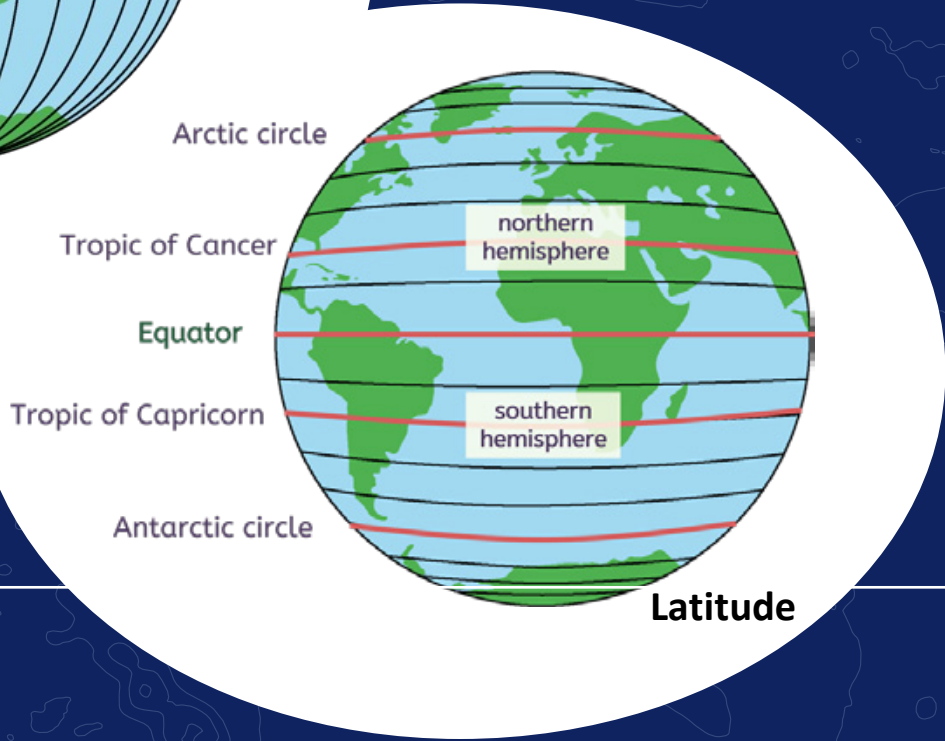
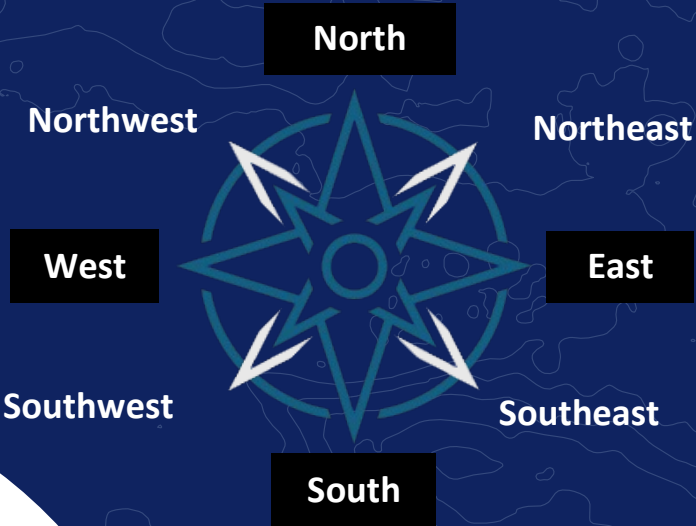
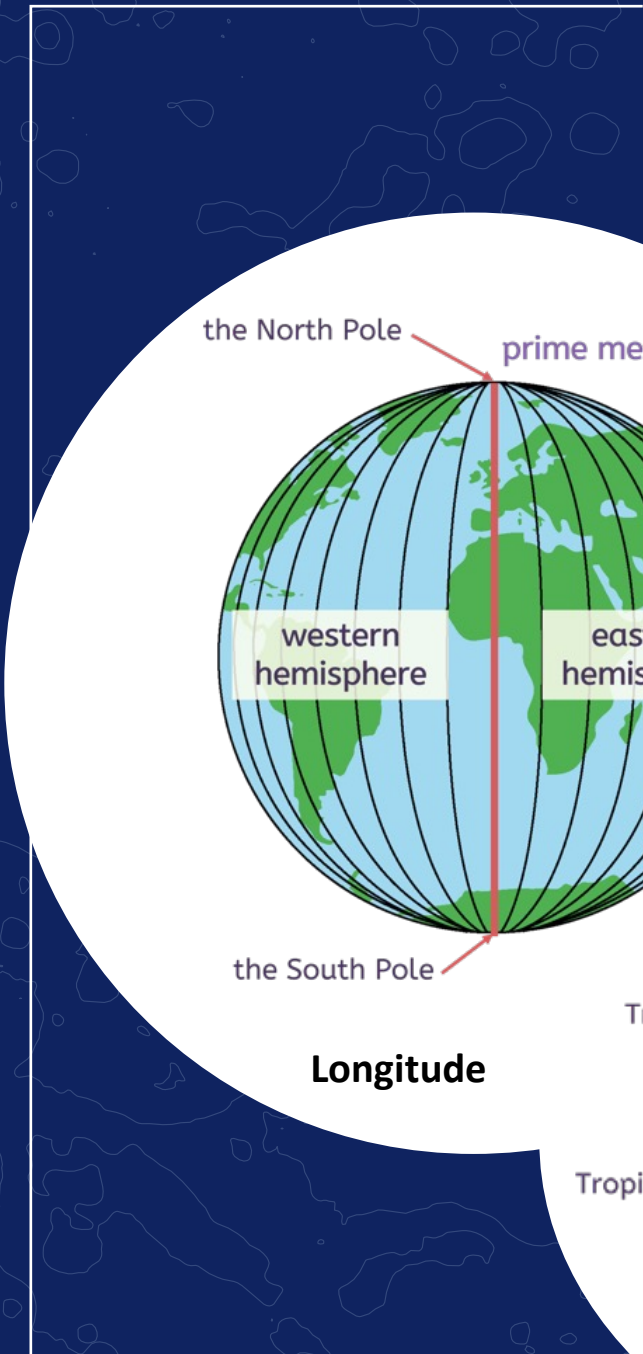
Relief - Questions

15. What are the contour lines used for on 2D maps?
16. What are the 3 ways that relief is show on maps?
17. What is being described ... ‘brown lines connecting areas of the same height’
18. What is being described ... ‘a dot giving the exact height of a specific point.’
19. What is being described... ‘different heights are shown by bands of different colours’
20. For colour layering brown often represents upland/lowland areas.





Longitude and latitude





Continents, oceans and countries in the UK - Questions

1. Name the seven continents
2. Name the five oceans.
3. What is the capital of Scotland?
4. Which four countries make up the UK?
5. Which ocean is between the UK and the USA?
6. Which continent is north of the continent of Africa?
7. What is the capital of England?
8. What is the name of the sea between Wales / England and Northern Ireland?
9. Fill in the missing word \_\_\_\_\_ Channel.
10. What is the capital of Wales?

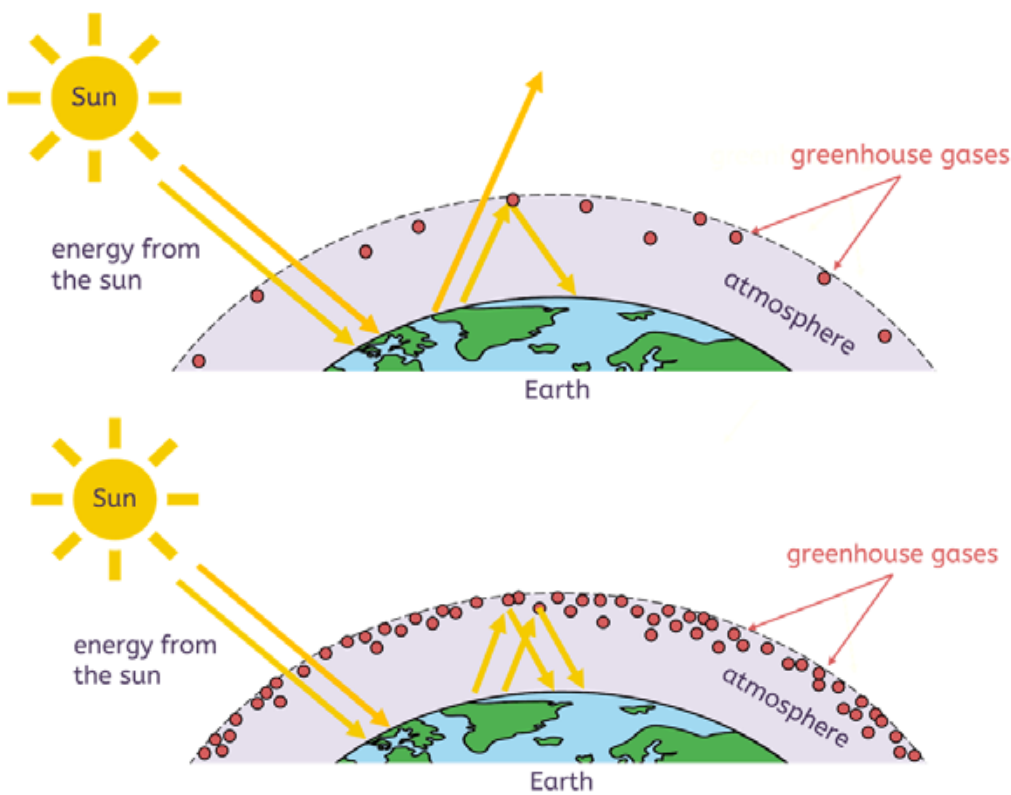
Continents, oceans and countries in the UK - Questions

11. What are the four points on a compass rose?
12. What is the point between north and east called?
13. What is the point between south and west called?

Longitude and latitude - Questions

14. What are the imaginary lines across the globe known as?
15. What are the imaginary lines across the globe known as?
16. Which two hemispheres does the equator separate?
17. Is the equator a line of longitude or latitude?
18. Which two hemispheres does the prime meridian separate?
19. Is the prime meridian a line of longitude or latitude?
20. Is the Arctic Circle in the northern or southern hemisphere?

| Key Vocabulary                 |                                                                                                                                |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| greenhouse gases               | gases such as carbon dioxide that trap heat within the atmosphere                                                              |
| the greenhouse effect          | the natural warming of the planet to its habitable temperature, caused by trapping heat in the Earth's atmosphere              |
| the enhanced greenhouse effect | the unnatural warming of the Earth due to increased greenhouse gases in the atmosphere                                         |
| global warming                 | The increase of average temperatures on Earth; this happens naturally but happens faster due to the enhanced greenhouse effect |
| climate change                 | the change in the Earth's long-term weather patterns, including precipitation, wind and temperature                            |
| fossil fuel                    | a (chemical) store of energy formed over millions of years from dead plants and animals                                        |



The enhanced greenhouse effect causes an unnatural increase in temperature.

The causes of climate change

Climate change is caused by:

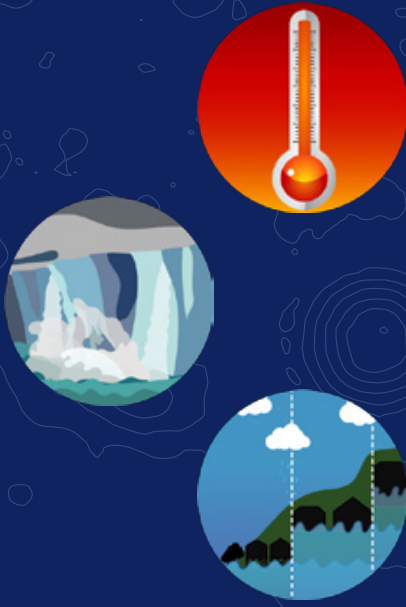
- burning fossil fuels for transport and electricity generation, which releases greenhouse gases
- deforestation, which reduces the absorption of green house gases
- agriculture and waste disposal, which release green house gases



The effects of climate change

Climate change can cause:

- more extreme weather events, such as heatwaves
- melting sea ice and ice caps
- rising sea levels and flooding of coastal areas



Global Warming - Questions

|                                                                                             |
|---------------------------------------------------------------------------------------------|
| 1. What is the name of the collection of gases around the Earth?                            |
| 2. What are greenhouse gases?                                                               |
| 3. What is the difference between the greenhouse effect and the enhanced greenhouse effect? |
| 4. Why does the enhanced greenhouse effect occur?                                           |
| 5. Define climate change.                                                                   |
| 6. Define global warming.                                                                   |
| 7. What is a fossil fuel?                                                                   |
| 8. What is the greenhouse effect?                                                           |
| 9. What is the enhanced greenhouse effect?                                                  |
| 10. What causes the enhanced greenhouse effect?                                             |
| 11. Why is the enhanced greenhouse effect a problem?                                        |
| 12. Is the greenhouse effect always harmful?                                                |

The causes of climate change - Questions

|                                                              |
|--------------------------------------------------------------|
| 13. What is one major cause of climate change?               |
| 14. How does deforestation contribute to climate change?     |
| 15. How does agriculture contribute to climate change?       |
| 16. How does waste disposal contribute to climate change?    |
| 17. What are greenhouse gases?                               |
| 18. Name two human activities that release greenhouse gases. |
| 19. Why is electricity generation a cause of climate change? |
| 20. What role does transport play in climate change?         |
| 21. What is one effect of climate change on weather?         |
| 22. How does climate change affect sea ice?                  |
| 23. What happens to sea levels due to climate change?        |
| 24. What is a consequence of rising sea levels?              |

Background

|                                                                             |                                                                                                                                                                                      |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rivers affect the landscape and the lives of the people who live near them. |                                                                                                                                                                                      |
| A                                                                           | Rivers are found within their own drainage basin and have their own distinct features.                                                                                               |
| B                                                                           | As a river moves from its source in the upper course to its mouth in the lower course, its profile changes.                                                                          |
| C                                                                           | There are many different river processes that can impact the landscape.                                                                                                              |
| D–F                                                                         | The processes of erosion and deposition can lead to the formation of different river landforms.                                                                                      |
| G                                                                           | Flooding is a key feature of rivers, and drainage basin processes play a significant role in this. By altering the drainage basin of a river, we can interfere with these processes. |
| H                                                                           | There are many examples of floods. Today, many strategies have been put in place to manage the flood risk.                                                                           |

A. Drainage Basin Features

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| 1. drainage basin | (n) an area of land drained by a river and its tributaries |
| 2. source         | (n) the start of a river                                   |
| 3. mouth          | (n) the place where the river enters a lake, sea or ocean  |
| 4. tributary      | (n) a smaller river that joins a larger river              |
| 5. confluence     | (n) the point at which two or more rivers meet             |
| 6. watershed      | (n) the dividing line between two drainage basins          |

B. The River Profile

|                  |                                                                                       |
|------------------|---------------------------------------------------------------------------------------|
| 1. upper course  | the narrow, steep, upper part of a river, which contains waterfalls                   |
| 2. middle course | the wider, deeper channel, which contains meanders and oxbow lakes                    |
| 3. lower course  | the widest, flattest part of the river near the mouth, which contains the floodplain. |

C. River Processes

|                     |                                                                                                   |
|---------------------|---------------------------------------------------------------------------------------------------|
| 1. river load       | (n) the material carried along in the river                                                       |
| 2. erosion          | (n) the breaking down or wearing away of material.                                                |
| 3. vertical erosion | (n) erosion which takes place downwards into the land.                                            |
| 4. lateral erosion  | (n) when erosion moves across the land from side to side, causing the bends of meanders to widen. |
| 5. transportation   | (n) when rivers carry rocks and sediment along their journey                                      |
| 6. deposition       | (n) when a river drops its load                                                                   |

D. River features - waterfalls

|                |                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------|
| 1. waterfalls  | (n) water falling from a height when a river or stream flows over a steep drop (upper course) |
| 2. plunge pool | (n) an area at the base of a waterfall that undercuts the hard rock layer                     |
| 3. gorge       | (n) a steep sided valley left behind when a waterfall retreats upstream                       |

E. River features - meanders

|                   |                                                                                   |
|-------------------|-----------------------------------------------------------------------------------|
| 1. meander        | (n) a bend in a river (middle course)                                             |
| 2. slip-off slope | (n) the sloping bend of a meander from the inside (shallow) to the outside (deep) |
| 3. river cliff    | (n) the undercut bank on the outside bend of a meander                            |

F. River features - Floodplains

|               |                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------|
| 1. floodplain | (n) a wide, flat area of land that is flooded frequently when a river bursts its banks (lower course) |
| 2. levee      | (n) banks found at the side of a river in the lower course                                            |
| 3. silt       | (n) the fine, fertile eroded material transported by a river                                          |

G. The drainage basin system

|                    |                                                                           |
|--------------------|---------------------------------------------------------------------------|
| 1. precipitation   | (n) water falling to the ground in all forms (rain, snow, sleet and hail) |
| 2. interception    | (n) when the leaves of trees stop precipitation reaching the ground       |
| 3. surface runoff  | (n) the movement of water over the surface of the land back into a river  |
| 4. surface storage | (n) water stored on the surface in lakes or puddles                       |
| 5. infiltration    | (n) the movement of water from the surface into the soil                  |
| 6. throughflow     | (n) the movement of water through the soil back into the river            |

H. The drainage basin system

|                                                           |                                                             |                                                                                                 |
|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Where/when                                                | Southwest England, flood 2014<br>Rivers Parrett and Tone    |                                                                                                 |
| Causes                                                    | Effects                                                     | Responses                                                                                       |
| deforestation on the floodplain                           | 600 homes flooded                                           | 20,000 sandbags provided to protect homes                                                       |
| saturated ground from heavy rainfall                      | £200 million lost from the collapse of the tourist industry | 65 pumps installed to drain millions of cubic metres of floodwater                              |
| low-lying land with four rivers flowing through it        | 6,800 hectares of agricultural land flooded                 | Hundreds of people were evacuated from their homes.                                             |
| build-up of sediment in the channel from lack of dredging | Native bird species couldn't hunt on the flooded ground.    | The Environmental Agency is spending £6 million a year on dredging the rivers Parrett and Tone. |



Knowledge and Understanding

1. What is a drainage basin?
2. Name the point where two rivers meet.
3. What is the source of a river?
4. What is the mouth of a river?
5. Define a tributary.
6. What is a watershed?
7. Which part of a river is typically steep and narrow?
8. What landforms are found in the middle course of a river?
9. What is a floodplain and where is it found?
10. What is vertical erosion?



Knowledge and Understanding

11. Explain the difference between lateral and vertical erosion.

12. What is meant by river transportation?

13. What is deposition in a river system?

14. What is a river load?

15. How is a gorge formed?

16. What is a plunge pool and how does it form?

17. Define a meander.

18. What is a slip-off slope?

19. What is a river cliff and where is it found?

20. What is silt and why is it important

Flooding & Case Study: Somerset Levels

21. List two causes of the 2014 Somerset Levels flood.

22. Name two effects of the Somerset flood.

23. What were two responses to the Somerset flood?

24. How did deforestation contribute to the flooding?

25. Why was dredging important in the Somerset Levels?

26. What is precipitation?

27. What is interception and how does it affect flooding?

28. Define surface runoff.

29. What is infiltration and how does it help reduce flood risk?

30. Explain the role of throughflow in the drainage basin system.

| Background |                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------|
| A          | The world of work can be classified into four different employment sectors.                                                  |
| B          | Many factors influence the type of employment sector which will be found within a particular country.                        |
| C          | Industrial location is influenced by some key factors, which are more important for some industries in comparison to others. |
| D          | Employment structure within countries varies based upon the level of development.                                            |
| E          | Trade, imports and exports.                                                                                                  |
| F          | Employment sectors and impact of industry in Russia.                                                                         |

| A. Employment sectors    |                                                                                                                                                               |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. employment            | (n) when people are in work, receiving a wage and paying tax.                                                                                                 |
| 2. unemployment          | (n) when people are not in work, therefore do not receive a wage and do not pay tax.                                                                          |
| 3. primary industries    | (n) industries which collect or extract natural resources from the environment, such as farming or fishing.                                                   |
| 4. secondary industries  | (n) industries which manufacture goods into products, such as builders, car manufacturers or food processing                                                  |
| 5. tertiary industries   | (n) industries that provide a service, such as teachers, doctors, sales, hairdressers or bus drivers.                                                         |
| 6. quaternary industries | (n) industries that involve using technology, design and research, including computer scientists, game designers, computer engineers and research scientists. |

| B. Influences on employment structures |                                                                                           |
|----------------------------------------|-------------------------------------------------------------------------------------------|
| 1. industrialisation                   | (n) a move from primary employment to secondary employment, with a rise in manufacturing. |
| 2. mechanisation                       | (n) when machinery begins to do the jobs which once required humans.                      |
| 3. disposable income                   | (n) the money a person has left to spend after they have paid all their bills.            |
| 4. public services                     | (n) a service that is given or funded for the benefit of the community.                   |

| C. The location of industries |                                                                                                    |
|-------------------------------|----------------------------------------------------------------------------------------------------|
| 1. site                       | (n) the actual place where a settlement first grew up. This refers mainly to its physical setting. |
| 2. situation                  | (n) the location of a place relative to other features nearby.                                     |
| 3. footloose                  | (adj) industries which are not tied to a specific location and can operate from anywhere.          |
| 4. raw materials              | (n) natural resources that are used to make other things.                                          |
| 5. labour                     | (n) workers, employed people.                                                                      |
| 6. market                     | (n) a place where things are bought and sold.                                                      |

| D. Employment structures and development |                                                                                                                                                         |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Countries                                | Industries                                                                                                                                              |
| developing countries                     | Large primary sector, growing secondary sector and a moderate tertiary sector.                                                                          |
| emerging countries                       | large secondary sector, rapidly falling primary sector and growing tertiary sector.                                                                     |
| developed countries                      | A large tertiary sector, a growing quaternary sector, both secondary and primary employment is low.                                                     |
| Change                                   | Cause                                                                                                                                                   |
| Falling primary and secondary sector     | 1. Cheaper to import.<br>2. Mechanisation has taken jobs.<br>3. Raw materials have been exhausted in certain areas.                                     |
| Growing tertiary sector                  | 1. Disposable income has increased, so a greater demand for services.<br>2. A large public sector e.g. health and education, due to a high tax revenue. |

E. Trade

|               |                                                                                          |
|---------------|------------------------------------------------------------------------------------------|
| 1.trade       | (n) the exchange of goods and materials between countries.                               |
| 2. import     | (v) goods brought into a country.                                                        |
| 3. export     | (v) sending goods to another country for sale.                                           |
| 4. trade bloc | (n) an arrangement in which participant countries lower trade barriers with one another. |
| 5. tariff     | (n) a tax imposed on goods when they are imported or exported between countries.         |

F. Case study: World of work in Russia

| Factors effecting trade in Russia                                                                           |                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Opportunities                                                                                               | Challenges                                                                                                          |
| With a working population of over 75 million people, Russia has one of the largest workforces in the world. | Russia is at war with Ukraine which affects international relationships.                                            |
| The Steppe and temperate woodlands of western Russia are fertile and flat.                                  | Russia has the largest land mass of any country.                                                                    |
| Russia has an extensive network of roads, railways, ports and pipelines.                                    | Russia does not have a warm water port.                                                                             |
| Russia has vast reserves of natural resources including oil and natural gas.                                | Many countries aim to buy and use less oil and natural gas in the future to mitigate the effects of climate change. |
| Russia’s education system puts a strong focus on science, technology, engineering and maths (STEM).         |                                                                                                                     |



Employment Sectors & Definitions

|                                    |
|------------------------------------|
| 1. What is employment?             |
| 2. What is unemployment?           |
| 3. What are primary industries?    |
| 4. What are secondary industries?  |
| 5. What are tertiary industries?   |
| 6. What are quaternary industries? |
| 7. What is industrialisation?      |
| 8. What is mechanisation?          |
| 9. What is disposable income?      |
| 10. What are public services?      |

Employment Structures

11. Which sector is largest in developing countries?
12. What sector is growing in emerging countries?
13. Which sectors are small in developed countries?
14. What sector is growing in developed countries?
15. Why is the tertiary sector growing?
16. Why are primary and secondary sectors falling?

Employment Structures

17. What is a site?
18. What is a situation?
19. What are footloose industries?
20. What are raw materials?
21. What is labour?
22. What is a market?

Trade & Globalisation

23. What is trade?
- 24.What is an import?
25. What is an export?
26. What is a trade bloc?
27. What is a tariff?

Case Study: Russia

28. How many people are in Russia’s workforce?
29. What is one challenge Russia faces in trade?
30. What is one opportunity for Russia’s economy?

| Background |                                                                                                                                                       |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| A          | The Middle East is a region that covers western Asia, parts of northern Africa and south-eastern Europe.                                              |
| B          | The Middle East has huge reserves of natural resources.                                                                                               |
| C          | Trade in the Middle East is heavily influenced by the region's vast oil and natural gas reserves, making it a critical part of global energy markets. |
| D          | Saudi Arabia: Some countries in the Middle East are trying to diversify their economies.                                                              |
| E          | Yemen: Development can vary between countries within The Middle East.                                                                                 |

| A. Features of The Middle East |                                                                                                                  |
|--------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1. region                      | (n) a large area with common physical or human characteristics.                                                  |
| 2. population distribution     | (n) how people are spread out over an area.                                                                      |
| 3. fertile soil                | (n) soil rich in nutrients.                                                                                      |
| 4. natural resource            | (n) a useful thing or material that is found in nature, such as food, water or wood.                             |
| 5. colonialism                 | (n) acquiring control over another country, occupying it with settlers and sometimes exploiting it economically. |
| 6. plain                       | (n) a broad, flat or gently rolling land area with minimal variation in terrain.                                 |
| 7. peninsula                   | (n) a landform surrounded by water on three sides but connected to a larger landmass on one side.                |
| 8. wadi                        | (n) a dry riverbed or valley, typically found in arid or semi-arid regions.                                      |

| B. Influences on employment structures |                                                                                                             |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------|
| fossil fuel                            | (n) a natural fuel such as coal or gas. Formed from the remains of living organisms in the geological past. |
| non-renewable                          | (n) energy which is finite, not sustainable, and takes a long time to replenish.                            |
| refined                                | (n) separating and purifying different components of crude oil to produce useful products.                  |
| extraction                             | (n) the act of taking something from the ground.                                                            |
| crude oil                              | (n) naturally occurring, unrefined petroleum that can be refined into diesel, petrol etc..                  |

| B. Influences on employment structures (Continued) |                                                                                        |
|----------------------------------------------------|----------------------------------------------------------------------------------------|
| energy                                             | (n) a source of usable power.                                                          |
| supply                                             | (n) the amount of something producers are willing to sell at a certain price.          |
| demand                                             | (n) the amount of something consumers are willing to buy at a certain price.           |
| sustainability                                     | (n) meeting the needs of today, while making sure we can meet the needs of the future. |

| C. Trade    |                                                                        |
|-------------|------------------------------------------------------------------------|
| trade       | (n) the exchange of goods and materials between countries.             |
| import      | (v) goods brought into a country.                                      |
| export      | (v) sending goods to another country for sale.                         |
| trade route | (n) a passage of travel used by traders, either on land or in the sea. |

| D. Case study: Diversification in Saudi Arabia      |                                                                                                          |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1. diversify                                        | (v) to vary in order to spread the risk or expand.                                                       |
| 2. single major industry                            | (n) a significant portion of a country's economic activity is concentrated within a specific sector.     |
| 3. stakeholder                                      | (n) a person who has an interest in something or who is affected by something.                           |
| 4. climate change                                   | (n) the changes in the Earth's long-term weather patterns, which is being sped up due to global warming. |
| Factors influencing diversification and development |                                                                                                          |
| Diversification in Saudi Arabia                     | Cause                                                                                                    |
| the demand for natural resources                    | famine                                                                                                   |
| the supply of natural resources                     | infrastructure                                                                                           |
| switch to renewable energy sources                  | conflict and corruption                                                                                  |
| religious pilgrimage                                | water scarcity                                                                                           |
| opportunities for tourism                           | trade                                                                                                    |



E. Case study: Development in Yemen

|                          |                                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 1. developed countries   | (n) countries with high standards of living, advanced infrastructure and strong economies.                                    |
| 2. developing countries  | (n) countries with lower standards of living, less advanced infrastructure and economies that are growing but not yet strong. |
| 3. borders               | (n) a real or artificial line that separates geographic areas.                                                                |
| 4. corruption            | (n) the misuse of power for private gain.                                                                                     |
| 5. civil war             | (n) war between citizens of the same country.                                                                                 |
| 6. humanitarian crisis   | (n) an event or events that threaten the health, safety or wellbeing of a large group of people.                              |
| 7. Sykes-Picot agreement | (n) a secret 1916 agreement between the United Kingdom and France to divide up parts of the Middle East for themselves.       |
| 8. infrastructure        | (n) the basic structure or features of an area or system e.g. roads, schools, hospitals and electric connectivity.            |

Geography & Definitions

1. What is a region?
2. What is population distribution?
3. What is fertile soil?
4. What is a plain?
5. What is a peninsula?
6. What is a wadi?
7. What is colonialism?

Natural Resources & Energy

8. What is a natural resource?
9. What is crude oil?
10. What is a fossil fuel?
11. What does non-renewable mean?
12. What is extraction?
13. What does refined mean in oil production?
14. What is energy?
15. What is sustainability?

Trade & Economy

16. What is trade?
17. What is an import?
18. What is an export?
19. What is a trade route?
20. What is supply?
21. What is demand?

Case Study: Saudi Arabia

22. What does it mean to diversify an economy?
23. Why is Saudi Arabia diversifying its economy?
24. What are some diversification opportunities in Saudi Arabia?

Case Study: Yemen

25. What are some development challenges in Yemen?
26. What is infrastructure?
27. What is a humanitarian crisis?
28. What is a civil war?

History & Politics

29. What was the Sykes-Picot Agreement?
30. What is a stakeholder?

| Background                                                                                                                                                                                        |                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| The enquiry process in geography fieldwork involves six stages: developing a question, collecting data, presenting data, analysing results, drawing conclusions and evaluating the investigation. |                                                                                                             |
| A                                                                                                                                                                                                 | The enquiry question or hypothesis is used to guide the investigation and gives you something to test.      |
| B                                                                                                                                                                                                 | Collecting data involves using different methods to collect data to help answer the question or hypothesis. |
| C                                                                                                                                                                                                 | Presenting data involves showing the data on graphs, labelled photographs, maps etc..                       |
| D                                                                                                                                                                                                 | Analysing data involves reviewing the data to find trends, patterns and anomalies.                          |
| E                                                                                                                                                                                                 | A conclusion is what you found out in relation to the question or hypothesis.                               |
| F                                                                                                                                                                                                 | An evaluation answers how you would improve your fieldwork enquiry if you were to do it again.              |

| A. Hypothesis  |                                                                                                                                                                                                    |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. enquiry     | (n) a systematic process of investigation and exploration to gather information including a question or hypothesis, data collection, data presentation, data analysis, conclusions and evaluation. |
| 2. fieldwork   | (n) practical work undertaken in physical and human environments to investigate geographical questions or hypotheses.                                                                              |
| 3. prove       | (v) to demonstrate or establish the truth or validity of something through evidence.                                                                                                               |
| 4. disprove    | (v) to show that something is not true or valid through evidence.                                                                                                                                  |
| 5. investigate | (v) to carefully examine or explore something in order to gather information.                                                                                                                      |
| 6. hypothesis  | (n) a prediction or statement which can be proven to be correct or incorrect based on the evidence collected in the field.                                                                         |

| B. Data collection |                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. data collection | (n) the process of gathering information or facts through various methods.                                                                      |
| 2. primary data    | (n) data that you collect first hand.                                                                                                           |
| 3. risk assessment | (n) a way of looking at potential dangers or problems in a certain area to understand how likely they are and how much damage they might cause. |
| 4. mitigate        | (v) to make something less serious than it could have been.                                                                                     |

| B. Data collection (Continued) |                                                                                                                                                              |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5. sample                      | (n)a representative portion of a larger group or population that is selected for study or analysis.                                                          |
| 6. random sampling             | (n) selecting a person to interview or site to measure, at random. Random sampling is unbiased as particular people or places are not specifically selected. |
| 7. systematic sampling         | (n) collecting data in an ordered or regular way, e.g. every five metres or every fifth person.                                                              |
| 8. survey                      | (n) a method of gathering information.                                                                                                                       |
| 9. field sketch                | (n) a simple drawing made on-site to show key features of a landscape or area.                                                                               |
| 10. methodology                | (n) the approach or set of methods used to conduct research.                                                                                                 |

| C. Data presentation |                                                                  |
|----------------------|------------------------------------------------------------------|
| 1. data presentation | (n) strategies used to communicate and display findings clearly. |

| D. Data analysis |                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------|
| 1. data analysis | (n) the process of examining information to understand it better and make decisions based on what it reveals. |
| 2. mean          | (n) add the total of all values that have been collected and then divide by the number of values.             |
| 3. range         | (n) the difference between the highest and lowest values in a dataset.                                        |
| 4. percentage    | (n) divide the part by the whole, then multiply the result by 100.                                            |
| 5. anomaly       | (n) something that is different from what is expected or normal.                                              |

| E. Conclusion |                                                                   |
|---------------|-------------------------------------------------------------------|
| 1. Conclusion | (n) a summary of something that has been found out or identified. |

F. Evaluation

|                |                                                                                                                                                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. evaluation  | (n) determining the strengths and limitations of the study by identifying areas for improvement and assessing the reliability of the findings. |
| 2. bias        | (n) the tendency to favour or support one viewpoint, person, or group over others, often leading to unfairness.                                |
| 3. reliability | (n) the consistency of results and conclusions, e.g. keeping factors the same to compare variables.                                            |
| 4. accuracy    | (n) the number of errors in the collection of data, e.g. using the correct equipment.                                                          |

Our fieldwork investigation

|                                           |                                                                        |
|-------------------------------------------|------------------------------------------------------------------------|
| Fieldwork enquiry question or hypothesis: | The location around the school site with the greatest flood risk is X. |
| 1. permeable                              | (n) something that allows liquids or gases to pass through easily.     |
| 2. infiltration                           | (n) The movement of water from the surface into the soil layer.        |
| 3. infiltration time                      | (n) the speed at which water moves from the surface into the soil.     |

The Enquiry Process Questions

|                                                                 |
|-----------------------------------------------------------------|
| 1. What are the six stages of the geographical enquiry process? |
| 2. What is a hypothesis?                                        |
| 3. What is the purpose of a fieldwork enquiry question?         |
| 4. What is fieldwork?                                           |
| 5. What is an enquiry?                                          |

Data collection & sampling

|                                           |
|-------------------------------------------|
| 6. What is primary data?                  |
| 7. What is a sample?                      |
| 8. What is random sampling?               |
| 9. What is systematic sampling?           |
| 10. What is a survey?                     |
| 11. What is a field sketch?               |
| 12. What is a risk assessment?            |
| 13. What does it mean to mitigate a risk? |
| 14. What is methodology?                  |

Data presentation & Analysis

15. What is data presentation?

16. What is data analysis?

17. What is a mean?

18. What is a range?

19. How do you calculate a percentage?

20. What is an anomaly?

Conclusion & Evaluation

21. What is a conclusion in fieldwork?

22. What is an evaluation?

23. What is bias?

24. What is reliability in fieldwork?

25. What is accuracy in data collection?

Flood Risk Fieldwork Example

26. What was the fieldwork hypothesis in the example?

27. What does permeable mean?

28. What is infiltration?

29. What is infiltration time?

30. Why is understanding infiltration important in flood risk studies?





**YEAR 7**

# Spanish



SPANISH GRAMMAR  
SPANISH VOCABULARY



A – Position

In Spanish, unlike in English, most adjectives come after the noun they are describing.

For example:

- Una **casa** blanca – a white **house** (the adjective blanca comes after the **noun casa**)
- El **pelo** negro – black **hair** (the adjective black comes after the **noun hair**)
- Un **profesor** irritante – an irritating **teacher** (the adjective irritating comes after the **noun teacher**)

B – Agreement

Adjectives describe nouns. Adjective endings change according to whether the noun is masculine or feminine and singular or plural. There are different patterns of agreement, as follows:

|                       | singular   |             | plural       |              |
|-----------------------|------------|-------------|--------------|--------------|
|                       | masculine  | feminine    | masculine    | feminine     |
| ending in -o          | creativo   | creativa    | creativos    | creativas    |
| ending in -e          | sociable   | sociable    | sociables    | sociables    |
| ending in a consonant | fácil      | fácil       | fáciles      | fáciles      |
| ending in -dor        | trabajador | trabajadora | trabajadores | trabajadoras |

Mi hermano es creativo – Masculine, singular  
Mi hermana es creativa – Feminine, singular  
Mis hermanos son creativos – Masculine, plural  
Mis hermanas son creativas – Feminine, plural

Mi Hermano/hermana es sociable – Masculine/feminine singular  
Mis hermanos/hermanas son sociables – Masculine/feminine plural

El inglés/la informática es fácil – Maculine/feminine singular  
Los idiomas/las matemáticas son fáciles – Masculine/feminine plural

El camarero es trabajador – Masculine singular  
La camarera es trabajadora – Feminine singular  
Los camareros son trabajadores – Masculine plural  
Las camareras son trabajadoras – Feminine plural

A – Position – Self-quizzing

1. Choose the correct word to complete the sentence:  
Most adjectives come **before/after** the noun
2. Correct the errors in these phrases:  
La blanca casa                      B. El negro pelo                      C. Un irritante profesor
3. Correct the errors in these phrases:  
A. El negro perro                      B. Una difícil asignatura                      C. Mi favorito programa

B – Agreement – Self-quizzing

1. Adjective endings change depending on whether the noun is m\_\_\_\_\_ or f\_\_\_\_\_ and s\_\_\_\_\_ or p\_\_\_\_\_.
2. Choose the correct adjective:
- |                                 |                                         |                                     |
|---------------------------------|-----------------------------------------|-------------------------------------|
| Mi hermano es alto/alta         | El dibujo es interesante/interesante    | La chica es fiel/fiele              |
| Mi prima es bajo/baja           | La tecnología es excelente/excelenta    | Las personas son tristes/tristas    |
| Los gatos son pequeños/pequeñas | Los museos son grande/grandes           | La mujer es hablador/habladora      |
| Las cobayas son listos/listas   | Las piscinas son importante/importantes | Los niños son habladores/habladores |

A – Regular verbs

In the present tense, -ar, -er and -ir verbs follow different patterns of endings:

|                    | -ar               | -er            | -ir                 |
|--------------------|-------------------|----------------|---------------------|
|                    | bailar (to dance) | comer (to eat) | escribir (to write) |
| yo                 | bailo             | como           | escribo             |
| tú                 | bailas            | comes          | escribes            |
| él/ella / usted    | baila             | come           | escribe             |
| nosotros/as        | bailamos          | comemos        | escribimos          |
| vosotros/as        | bailáis           | coméis         | escribís            |
| ellos/as / ustedes | bailan            | comen          | escriben            |

To conjugate a verb (change an infinitive verb) in the present tense, you usually remove the AR/ER/IR endings to be left with the stem. You then add on the appropriate ending.

| Infinitive | Stem    | Present tense         |
|------------|---------|-----------------------|
| Cantar     | Cant    | Canto (I sing)        |
| Comer      | Com     | Como (I eat)          |
| Describir  | Describ | Describo (I describe) |

B – Irregular verbs

Some verbs don't follow the usual patterns. Learn each verb by heart.

| ir (to go) | ser (to be) | tener (to have) | ver (to see) |
|------------|-------------|-----------------|--------------|
| voy        | soy         | tengo           | veo          |
| vas        | eres        | tienes          | ves          |
| va         | es          | tiene           | ve           |
| vamos      | somos       | tenemos         | vemos        |
| vais       | sois        | tenéis          | veis         |
| van        | son         | tienen          | ven          |

Some verbs are irregular in the 'I' form only:  
**hacer** (to do / to make) → hago                      **salir** (to go out) → salgo

Irregular verbs don't follow the same pattern, and you just need to learn the differences.

C – Reflexive verbs

Reflexive verbs describe actions you do to yourself. They include a reflexive pronoun, e.g. **me, te, se**, which means 'myself', 'yourself', 'his/herself', etc..

**ducharse (to have a shower)**

**me** ducho  
**te** duchas  
**se** ducha  
**nos** duchamos  
**os** ducháis  
**se** duchan

Some reflexive verbs are stem-changing in the present tense:

**acostarse** (to go to bed) → me acuesto (I go to bed)  
**despertarse** (to wake up) → me despierto (I wake up)  
**vestirse** (to get dressed) → me visto (I get dressed)

Reflexive verbs are mostly used to describe daily routine actions or family relationships. You conjugate them in the same way as regular verbs, but you just include the reflexive pronoun.

A – Regular Verbs – Self-quizzing

- 1. Conjugate the following verbs into first person singular (I form):  
A. Visitar                      B. Beber                      C. Vivir
- 2. Conjugate the following verbs into first person plural (we form):  
A. Hablar                      B. Leer                      C. Vivir
- 3. Translate these phrases into Spanish:  
A. I talk      B. We drink      C. I write      D. We eat      E. I read      F. We visit

B – Irregular verbs – Self-quizzing

- 1. Conjugate the following verbs into first person singular (I form):  
A. Ir                      B. Tener                      C. Ser                      D. Ver
- 2. Conjugate the following verbs into first person plural (we form):  
A. Ir                      B. Tener                      C. Ser                      D. Ver

C – Reflexive verbs – Self-quizzing

- 1. Translate these phrases into Spanish:  
A. I get up      B. I have a shower      C. I get dressed      D. We have a shower      E. We get up

A – Regular verbs

In the preterite, regular -ar verbs follow one pattern of endings and -er and -ir verbs follow another:

|                    | -ar               | -er            | -ir                 |
|--------------------|-------------------|----------------|---------------------|
|                    | bailar (to dance) | comer (to eat) | escribir (to write) |
| yo                 | bailé             | comí           | escribí             |
| tú                 | bailaste          | comiste        | escribiste          |
| él/ella / usted    | bailó             | comió          | escribió            |
| nosotros/as        | bailamos          | comimos        | escribimos          |
| vosotros/as        | bailasteis        | comisteis      | escribisteis        |
| ellos/as / ustedes | bailaron          | comieron       | escribieron         |

To conjugate a verb (change an infinitive verb) in the present tense, you usually remove the AR/ER/IR endings to be left with the stem. You then add on the appropriate ending.

| Infinitive | Stem    | Present tense          |
|------------|---------|------------------------|
| Cantar     | Cant    | Canté (I sang)         |
| Comer      | Com     | Comí (I ate)           |
| Describir  | Describ | Describí (I described) |

A – Regular Verbs – Self-quizzing

- Conjugate the following verbs into first person singular (I form):  
A. Visitar                      B. Beber                      C. Vivir
- Conjugate the following verbs into first person plural (we form):  
A. Hablar                      B. Leer                      C. Vivir
- Translate these phrases into Spanish:  
A. I talked    B. We drank    C. I wrote    D. We ate    E. I read    F. We visited

B – Irregular verbs

Some verbs don't follow the usual patterns in the preterite. Learn each verb by heart.

| ir (to go) | ser (to be) | hacer (to do / make) | tener (to have) | ver (to see) |
|------------|-------------|----------------------|-----------------|--------------|
| fui        | fui         | hice                 | tuve            | vi           |
| fuiste     | fuiste      | hiciste              | tuviste         | viste        |
| fue        | fue         | hizo                 | tuvo            | vio          |
| fuimos     | fuimos      | hicimos              | tuvimos         | vimos        |
| fuisteis   | fuisteis    | hicisteis            | tuvisteis       | visteis      |
| fueron     | fueron      | hicieron             | tuvieron        | vieron       |

The verbs ir and ser are identical in the preterite, but the context makes it clear which verb is meant. In the preterite, the following verbs are irregular in the 'I' form only:

**sacar** (to take) - saqué (I took)    **jugar** (to play) - jugué (I played)    **tocar** (to play) - toqué (I played)

Irregular verbs don't follow the same pattern, and you just need to learn the differences.

B – Irregular verbs – Self-quizzing

- Conjugate the following verbs into first person singular (I form):  
A. Sacar                      B. Jugar                      C. Tocar
- Conjugate the following verbs into first person plural (we form):  
A. Ir                      B. Ser                      C. Hacer
- Translate these phrases into Spanish:  
A. I had                      B. We saw                      C. I went                      D. We had                      E. I was F. I did/I

A – Near future - Ir a + infinitive

The near future tense is used to talk about what you are going to do. Use the present tense of the verb ir followed by a plus the infinitive.

|                                   |                                       |
|-----------------------------------|---------------------------------------|
| <b>voy a</b> salir con mis amigos | I am going to go out with my friends  |
| <b>vas a</b> ver la television    | you are going to watch TV             |
| <b>va a</b> ir de paseo           | he/she is going to go for a walk      |
| <b>vamos a</b> jugar al voleibol  | we are going to play volleyball       |
| <b>vais a</b> chatear             | you (plural) are going to chat online |
| <b>van a</b> hacer los deberes    | they are going to do their homework   |

A – Use the present tense of the verb ‘ir’, the letter ‘a’ and then an infinitive.

Voy a jugar = I am going to play  
Voy a beber = I am going to drink  
Voy a visitar = I am going to visit  
Voy a ir = I am going to go

B – Future time frame

Use a conjugated verb followed by the infinitive.

|                                    |                                       |
|------------------------------------|---------------------------------------|
| <b>Quiero</b> salir con mis amigos | <b>I want</b> to go out               |
| <b>Espero</b> ver la television    | <b>I hope</b> to watch TV             |
| <b>Me gustaría</b> ir de paseo     | <b>I would</b> like to go for a walk  |
| <b>Quisiera</b> hacer los deberes  | <b>I would</b> like to do my homework |

A – Simple Future – Self-quizzing

1. Translate these phrases into Spanish:
- |                        |                             |                                 |
|------------------------|-----------------------------|---------------------------------|
| A. I am going to talk  | B. I am going to drink      | C. I am going to write          |
| D. We are going to eat | E. I am going to read       | F. We are going to visit        |
| G. I am going to play  | H. We are going to watch TV | I. I am going to do my homework |

B – Future Time Frame – Self-quizzing

1. Translate these phrases into Spanish:
- |                                 |                                     |                          |
|---------------------------------|-------------------------------------|--------------------------|
| A. I want to talk to my friends | B. I hope to go for a walk          | C. I would like to write |
| D. I want to eat                | E. I hope to go out with my friends |                          |
| F. I would like to watch TV     | G. I want to play videogames        |                          |

A / B – Future – Self-quizzing

1. Choose the correct answer
- |                                              |                                            |
|----------------------------------------------|--------------------------------------------|
| A. Voy a <b>hablar/hablo</b> con mis amigos  | B. Espero <b>como/comer</b> patatas        |
| C. Quiero <b>visitar/visito</b> mis abuelos  | D. Me gustaría <b>veo/ver</b> una película |
| E. Quisiera <b>jugar/juego</b> al baloncesto | F. Vamos a <b>escribo/escribir</b>         |



A – Opinion + infinitive

You can use infinitives after opinion verbs such as me gusta (I like), no me gusta (I don't like), me encanta (I love), detesto/odio (I hate) and prefiero (I prefer).

For example:

|                                      |                                                                                       |
|--------------------------------------|---------------------------------------------------------------------------------------|
| Me gusta <u>leer</u> libros          | I like to <u>read</u> books / I like <u>reading</u> books.                            |
| No me gusta <u>nadar</u>             | I don't like to <u>swim</u> / I don't like <u>swimming</u> .                          |
| Me encanta <u>comer</u> chocolate    | I love to <u>eat</u> chocolate / I love <u>eating</u> chocolate.                      |
| Odio <u>ver</u> el telediario        | I hate to <u>watch</u> the news / I hate <u>watching</u> the news                     |
| Prefiero <u>salir</u> con mis amigos | I prefer <u>to go out</u> with my friends / I prefer <u>going out</u> with my friends |

B – Plural opinions

If the noun that you are giving an opinion about is plural (starts with 'los' or 'las'), opinion phrases that use 'me', such as 'me gusta', 'me encanta', 'me chifla', 'no me gusta' need to end in an 'n'.

|                                  |                            |
|----------------------------------|----------------------------|
| Me gustan <b>las</b> matemáticas | I like Maths               |
| Me encantan <b>los</b> animals   | I love animals             |
| No me gustan <b>las</b> montañas | I don't like the mountains |

A – Opinion + Infinitive – Self-quizzing

1. Choose the correct answer:  
A. Me gusta **salir/salgo** con mis amigos  
C. No me gusta **chatear/chateo**  
E. Odio **hago/hacer** mis deberes
- B. Me encanta **como/comer** en un restaurante  
D. Me gustaría **veo/ver** la tele
2. Translate these sentences into Spanish:  
A. I like to visit my grandparents  
B. I prefer to read books  
C. I don't like eating chocolate

B – Plural Opinions – Self-quizzing

1. Choose the correct answer:  
A. Me **gusta/gustan** las ciencias  
D. Me **gusta/gustan** los caramelos
- B. Me **gusta/gustan** el chocolate  
E. Me **encanta/encantan** los fines de semana
- C. Me **encanta/encantan** el fútbol
2. Translate these sentences into Spanish:  
A. I like sports  
B. I love books  
C. I don't like pasta

A / B – Future – Self-quizzing

1. Choose the correct answer  
A. Voy a **hablar/hablo** con mis amigos  
C. Quiero **visitar/visito** mis abuelos  
E. Quisiera **jugar/juego** al baloncesto
- B. Espero **como/comer** patatas  
D. Me gustaría **veo/ver** una película  
F. Vamos a **escribo/escribir**

A – Opinion + infinitive

Modal verbs are used to express ideas like possibility, ability, permission or necessity. Modal verbs must be followed by an infinitive.

| Key modal verbs |           | + | Key infinitives    |
|-----------------|-----------|---|--------------------|
| Se puede        | You can   |   |                    |
| Se debe         | You must  |   | Visitar – to visit |
| Suelo           | I usually |   | Ir – to go         |
| Tengo que       | I have to |   | Comer – to eat     |
|                 |           |   | Ver – to watch/see |
|                 |           |   | Ser – to be        |
|                 |           |   | Hacer – to do      |
|                 |           |   | Hablar – to talk   |
|                 |           |   | Salir – to go out  |

**Modal verb + infinitive**  
**You can** visit = **Se puede** visitar  
**You must** watch = **Se debe** ver  
**I usually** go = **Suelo** ir  
**I have to** eat = **Tengo que** comer

A – Understanding – Self-quizzing

1. What is a modal verb and what must it be followed by in Spanish?
2. Translate the following into Spanish: “You must go.”
3. What does “Tengo que” mean in English?
4. Which Spanish modal verb means “I usually”?
5. Identify the infinitive in the sentence: “Suelo hablar”

B – Practice – Self-quizzing

1. Translate into English:  
a. Se puede salir    b. Se debe ser    c. Tengo que hablar    d. Suelo ver
2. Translate these sentences into Spanish:  
a. I usually eat    b. You can go    c. You must talk    d. I have to do

Time

|               |              | Examples                                      |
|---------------|--------------|-----------------------------------------------|
| A la/las      | At           |                                               |
| Es la/son las | It is        | At one o'clock – A la una                     |
| Y cuarto      | Quarter past | At two o'clock - A las dos                    |
| Y media       | Half past    | At quarter past three – A las tres y cuarto   |
| Menos cuarto  | Quarter to   | At half past four – A las cuatro y media      |
| Y cinco       | Five past    | At quarter to five – A las cinco menos cuarto |
| Y diez        | Ten past     | It is one o'clock – Es la una                 |
| Y veinte      | Twenty past  | It is six o'clock – Son las seis              |
| Menos veinte  | Twenty to    | It is five past seven – Son las siete y cinco |
| Menos diez    | Ten to       | It is ten past eight – Son las ocho y diez    |
| Menos cinco   | Five to      | It is ten to nine – Son las nueve menos diez  |
|               |              | It is five to ten – Son las diez menos cinco  |

A – Match up – Self-quizzing

| English                 | Spanish                     |
|-------------------------|-----------------------------|
| a. It is quarter past 3 | 1. Son las ocho y diez      |
| b. It is 10 past 8      | 2. Son las tres y cuarto    |
| c. At quarter to 5      | 3. A las cinco menos cuarto |
| d. It is 5 to 10        | 4. Son las diez menos cinco |
| e. It is 6 o'clock      | 5. Son las seis             |

B – Fill in the gaps – Self-quizzing

1. Son las ocho y \_\_\_\_\_ (20)
2. A las cinco menos \_\_\_\_\_ (15)
3. Es la \_\_\_\_\_ (1)
4. Son las siete y \_\_\_\_\_ (25)
5. A las cuatro y \_\_\_\_\_ (30)

C – Translate – Self-quizzing

1. Translate into Spanish:  
a. It is one o'clock    b. It is ten past eight    c. At quarter past three    d. At five to ten
2. Translate into English:  
a. Son las seis    b. A la una    c. Son las nueve menos diez    d. A las tres y cuarto

| Spanish                   | English               | Spanish                  | English                  |
|---------------------------|-----------------------|--------------------------|--------------------------|
| 1 Me llamo                | I'm called...         | 36 Detesto               | I hate                   |
| 2 Se llama                | S/he is called...     | 37 Prefiero              | I prefer                 |
| 3 Adiós                   | Goodbye               | 38 Jugar                 | to play                  |
| 4 lunes                   | Monday                | 39 Hacer deporte         | to do sport              |
| 5 martes                  | Tuesday               | 40 Comer                 | to eat                   |
| 6 miércoles               | Wednesday             | 41 Porque                | Because                  |
| 7 jueves                  | Thursday              | 42 Es...                 | It's...                  |
| 8 viernes                 | Friday                | 43 Genial                | Great                    |
| 9 sábado                  | Saturday              | 44 Divertido             | Fun                      |
| 10 domingo                | Sunday                | 45 Interesante           | Interesting              |
| 11 Tengo ... años.        | I am ... years old.   | 46 Aburrido              | Boring                   |
| 12 Tiene ... años.        | She is ... years old. | 47 Un poco               | A bit                    |
| 13 Mi cumpleaños es el... | My birthday is...     | 48 Bastante              | Quite                    |
| 14 enero                  | January               | 49 Muy                   | Very                     |
| 15 febrero                | February              | 50 A mi ... le gusta     | My ... likes             |
| 16 marzo                  | March                 | 51 El fin de semana      | At the weekend           |
| 17 abril                  | April                 | 52 Veo la tele           | I watch television       |
| 18 mayo                   | May                   | 53 Escucho música        | I listen to music        |
| 19 junio                  | June                  | 54 Como con mi familia   | I eat with my family     |
| 20 julio                  | July                  | 55 Salgo con mis amigos  | I go out with my friends |
| 21 agosto                 | August                | 56 Juego en el ordenador | I play on my computer    |
| 22 septiembre             | September             | 57 Cuando                | When                     |
| 23 octubre                | October               | 58 Hace buen tiempo      | It's nice weather        |
| 24 noviembre              | November              | 59 Hace mal tiempo       | It's bad weather         |
| 25 diciembre              | December              | 60 Hace sol              | It's sunny               |
| 26 Vivo en...             | I live in...          | 61 Hace calor            | It's hot                 |
| 27 España                 | Spain                 | 62 Llueve                | It's raining/it rains    |
| 28 Inglaterra             | England               | 63 Nieva                 | It's snowing/it snows    |
| 29 Soy...                 | I am...               | 64 Hago natación         | I go swimming            |
| 30 Inglés/inglesa         | English               | 65 Voy de compras        | I go shopping            |
| 31 Hablo...               | I speak...            |                          |                          |
| 32 Español/española       | Spanish               |                          |                          |
| 33 Me gusta               | I like                |                          |                          |
| 34 No me gusta            | I don't like          |                          |                          |
| 35 Me encanta             | I love                |                          |                          |

| Number | Spanish    | Number | Spanish      |
|--------|------------|--------|--------------|
| 1      | uno        | 21     | veintiuno    |
| 2      | dos        | 22     | veintidós    |
| 3      | tres       | 23     | veintitrés   |
| 4      | cuatro     | 24     | veinticuatro |
| 5      | cinco      | 25     | veinticinco  |
| 6      | seis       | 26     | veintiséis   |
| 7      | siete      | 27     | veintisiete  |
| 8      | ocho       | 28     | veintiocho   |
| 9      | nueve      | 29     | veintinueve  |
| 10     | diez       | 30     | treinta      |
| 11     | once       | 40     | cuarenta     |
| 12     | doce       | 50     | cincuenta    |
| 13     | trece      | 60     | sesenta      |
| 14     | catorce    | 70     | setenta      |
| 15     | quince     | 80     | ochenta      |
| 16     | dieciséis  | 90     | noventa      |
| 17     | diecisiete | 100    | cien         |
| 18     | dieciocho  |        |              |
| 19     | diecinueve |        |              |
| 20     | veinte     |        |              |

Vocabulary

| Look                   |                       | Write | Check |
|------------------------|-----------------------|-------|-------|
| Me llamo...            | I'm called...         |       |       |
| Se llama               | S/he is called...     |       |       |
| Tengo ... años.        | I am ... years old.   |       |       |
| Tiene ... años.        | She is ... years old. |       |       |
| Mi cumpleaños es el... | My birthday is...     |       |       |
| Vivo en...             | I live in...          |       |       |
| Inglaterra             | England               |       |       |
| Soy...                 | I am...               |       |       |
| Hablo...               | I speak...            |       |       |
| Me gusta               | I like                |       |       |
| No me gusta            | I don't like          |       |       |
| Me encanta             | I love                |       |       |
| Detesto                | I hate                |       |       |
| Prefiero               | I prefer              |       |       |
| Jugar                  | to play               |       |       |
| Hacer deporte          | to do sport           |       |       |

Vocabulary

| Look                  |                       | Write | Check |
|-----------------------|-----------------------|-------|-------|
| Porque                | Because               |       |       |
| Es...                 | It's...               |       |       |
| Divertido             | Fun                   |       |       |
| Aburrido              | Boring                |       |       |
| El fin de semana      | At the weekend        |       |       |
| Veo la tele           | I watch television    |       |       |
| Escucho música        | I listen to music     |       |       |
| Como con mi familia   | I eat with my family  |       |       |
| Juego en el ordenador | I play on my computer |       |       |
| Hace buen tiempo      | It's nice weather     |       |       |
| Hace mal tiempo       | It's bad weather      |       |       |
| Hace sol              | It's sunny            |       |       |
| Hago natación         | I go swimming         |       |       |
| Voy de compras        | I go shopping         |       |       |

Vocabulary

| Look       |    | Write | Check |
|------------|----|-------|-------|
| Uno        | 1  |       |       |
| Dos        | 2  |       |       |
| Tres       | 3  |       |       |
| Cuatro     | 4  |       |       |
| Cinco      | 5  |       |       |
| Seis       | 6  |       |       |
| Siete      | 7  |       |       |
| Ocho       | 8  |       |       |
| Nueve      | 9  |       |       |
| Diez       | 10 |       |       |
| Once       | 11 |       |       |
| Doce       | 12 |       |       |
| Trece      | 13 |       |       |
| Catorce    | 14 |       |       |
| Quice      | 15 |       |       |
| Dieciséis  | 16 |       |       |
| Diecisiete | 17 |       |       |

Vocabulary

| Look             |     | Write | Check |
|------------------|-----|-------|-------|
| Dieciocho 18     | 18  |       |       |
| Diecinueve 19    | 19  |       |       |
| Viente 20        | 20  |       |       |
| Veintiuno 21     | 21  |       |       |
| Veintidós 22     | 22  |       |       |
| Veintitrés 23    | 23  |       |       |
| Veinticuatro 24  | 24  |       |       |
| Treinta 30       | 30  |       |       |
| Treinta y uno 31 | 31  |       |       |
| Treinta y dos 32 | 32  |       |       |
| Cuarenta 40      | 40  |       |       |
| Cincuenta 50     | 50  |       |       |
| Sesenta 60       | 60  |       |       |
| Setenta 70       | 70  |       |       |
| Ochenta 80       | 80  |       |       |
| Noventa 90       | 90  |       |       |
| Cien 100         | 100 |       |       |



| Vocabulary                            |                          |                                         |                                 |
|---------------------------------------|--------------------------|-----------------------------------------|---------------------------------|
| Spanish                               | English                  | Spanish                                 | English                         |
| En mi familia                         | In my family             | No me gusta                             | I don't like                    |
| Hay...                                | There is                 | Prefiero                                | I prefer                        |
| Mi madre / mi padre                   | My mum / my dad          | Ver la tele                             | To watch TV                     |
| Mi hermano / hermana                  | My brother / my sister   | Jugar al baloncesto / a los videojuegos | To play basketball / videogames |
| Tengo                                 | I have                   | Hacer deporte                           | To do sport                     |
| Los ojos azules / verdes / marrones   | Blue/green/brown eyes    | Leer                                    | To read                         |
| El pelo (rubio / pelirrojo / castaño) | Blonde/Ginger/brown hair | Ir al cine                              | To go to the cinema             |
| Soy...                                | I am                     | Porque es...                            | Because it is                   |
| Muy                                   | Very                     | Divertido                               | Fun                             |
| Bastante                              | Quite                    | Aburrido                                | Boring                          |
| Alto/a                                | Tall                     | Tengo                                   | I have                          |
| Bajo/a                                | Short                    | Un gato                                 | A cat                           |
| Simpático/a                           | Kind                     | Un perro                                | A dog                           |
| Gracioso/a                            | Funny                    | Es                                      | It is                           |
| Tiene                                 | He/she has               | En el futuro                            | In the future                   |
| Es                                    | He/she is                | Me gustaría tener                       | I would like to have            |
| Me gusta                              | I like                   |                                         |                                 |
| A mi hermano le gusta...              | My brother likes         |                                         |                                 |
| Me encanta                            | I love                   |                                         |                                 |
| Detesto                               | I hate                   |                                         |                                 |

| Vocabulary                            |                          |       |       |
|---------------------------------------|--------------------------|-------|-------|
| Look                                  |                          | Write | Check |
| En mi familia                         | In my family             |       |       |
| Hay...                                | There is                 |       |       |
| Mi madre / mi padre                   | My mum / my dad          |       |       |
| Mi hermano / hermana                  | My brother / my sister   |       |       |
| Tengo                                 | I have                   |       |       |
| Los ojos azules / verdes / marrones   | Blue/green/brown eyes    |       |       |
| El pelo (rubio / pelirrojo / castaño) | Blonde/Ginger/brown hair |       |       |
| Soy...                                | I am                     |       |       |
| Muy                                   | Very                     |       |       |
| Bastante                              | Quite                    |       |       |
| Alto/a                                | Tall                     |       |       |
| Bajo/a                                | Short                    |       |       |
| Simpático/a                           | Kind                     |       |       |
| Gracioso/a                            | Funny                    |       |       |
| Tiene                                 | He/she has               |       |       |
| Es                                    | He/she is                |       |       |
| Me gusta                              | I like                   |       |       |
| A mi hermano le gusta...              | My brother likes         |       |       |
| Me encanta                            | I love                   |       |       |
| Detesto                               | I hate                   |       |       |

| Vocabulary                              |                                 |       |       |
|-----------------------------------------|---------------------------------|-------|-------|
| Look                                    |                                 | Write | Check |
| No me gusta                             | I don't like                    |       |       |
| Prefiero                                | I prefer                        |       |       |
| Ver la tele                             | To watch TV                     |       |       |
| Jugar al baloncesto / a los videojuegos | To play basketball / videogames |       |       |
| Hacer deporte                           | To do sport                     |       |       |
| Leer                                    | To read                         |       |       |
| Ir al cine                              | To go to the cinema             |       |       |
| Porque es...                            | Because it is                   |       |       |
| Divertido                               | Fun                             |       |       |
| Aburrido                                | Boring                          |       |       |
| Tengo                                   | I have                          |       |       |
| Un gato                                 | A cat                           |       |       |
| Un perro                                | A dog                           |       |       |
| Es                                      | It is                           |       |       |
| En el futuro                            | In the future                   |       |       |
| Me gustaría tener                       | I would like to have            |       |       |

| Vocabulary                |                            |                         |                              |
|---------------------------|----------------------------|-------------------------|------------------------------|
| Spanish                   | English                    | Spanish                 | English                      |
| tengo...                  | I have...                  | Simpático/a             | Nice/friendly                |
| tenemos...                | we have...                 | Mi instituto es         | My school is...              |
| Estudio                   | I study                    | En mi colegio hay...    | In my school there is/are... |
| Estudiamos                | We study                   | Me gustaría             | I would like...              |
| A las...                  | At ... o'clock             | En la foto hay          | In the photo there is...     |
| lunes                     | Monday                     | Muchas personas         | Lots of people               |
| martes                    | Tuesday                    | Voy a + [infinitive]    | I'm going...                 |
| miércoles                 | Wednesday                  | Quiero                  | I want...                    |
| jueves                    | Thursday                   | Hacer los deberes       | To do my homework            |
| viernes                   | Friday                     | Ver la tele             | To watch television          |
| sábado                    | Saturday                   | Ir al parque            | To go to the park            |
| domingo                   | Sunday                     | Estudiar                | To study                     |
| Mi asignatura favorita es | My favourite subject is... | Jugar con mi móvil      | To play on my phone          |
| Porque es... / son...     | Because it's...            | Como                    | I eat                        |
| Fácil                     | Easy                       | Bebo                    | I drink                      |
| Útil                      | Useful                     | Leo                     | I read                       |
| Inglés                    | English                    | Juego al fútbol         | I play football              |
| Matemáticas               | Maths                      | Voy al centro           | I go to town                 |
| Mi profe favorito es...   | My favourite teacher is... | Hago deporte            | I do sport                   |
| Mi profe de informática   | My IT teacher              | Escucho música          | I listen to music            |
| Nos ayuda                 | He/she helps us            | Juego a los videojuegos | I play video games           |
| Explica bien              | He/she explains well       |                         |                              |

Vocabulary

| Look                      |                            | Write | Check |
|---------------------------|----------------------------|-------|-------|
| tengo...                  | I have...                  |       |       |
| tenemos...                | we have...                 |       |       |
| Estudio                   | I study                    |       |       |
| Estudiamos                | We study                   |       |       |
| A las...                  | At ... o'clock             |       |       |
| lunes                     | Monday                     |       |       |
| martes                    | Tuesday                    |       |       |
| miércoles                 | Wednesday                  |       |       |
| jueves                    | Thursday                   |       |       |
| viernes                   | Friday                     |       |       |
| sábado                    | Saturday                   |       |       |
| domingo                   | Sunday                     |       |       |
| Mi asignatura favorita es | My favourite subject is... |       |       |
| Porque es... / son...     | Because it's...            |       |       |
| Fácil                     | Easy                       |       |       |
| Útil                      | Useful                     |       |       |
| Inglés                    | English                    |       |       |
| Matemáticas               | Maths                      |       |       |
| Mi profe favorito es...   | My favourite teacher is... |       |       |
| Mi profe de informática   | My IT teacher              |       |       |
| Nos ayuda                 | He/she helps us            |       |       |
| Explica bien              | He/she explains well       |       |       |

Vocabulary

| Look                    |                               | Write | Check |
|-------------------------|-------------------------------|-------|-------|
| Simpático/a             | Nice/friendly                 |       |       |
| Mi instituto es         | My school is...               |       |       |
| En mi colegio hay...    | In my school there is/ are... |       |       |
| Me gustaría             | I would like...               |       |       |
| En la foto hay          | In the photo there is...      |       |       |
| Muchas personas         | Lots of people                |       |       |
| Voy a + [infinitive]    | I'm going...                  |       |       |
| Quiero                  | I want...                     |       |       |
| Hacer los deberes       | To do my homework             |       |       |
| Ver la tele             | To watch television           |       |       |
| Ir al parque            | To go to the park             |       |       |
| Estudiar                | To study                      |       |       |
| Jugar con mi móvil      | To play on my phone           |       |       |
| Como                    | I eat                         |       |       |
| Bebo                    | I drink                       |       |       |
| Leo                     | I read                        |       |       |
| Juego al fútbol         | I play football               |       |       |
| Voy al centro           | I go to town                  |       |       |
| Hago deporte            | I do sport                    |       |       |
| Escucho música          | I listen to music             |       |       |
| Juego a los videojuegos | I play video games            |       |       |

Vocabulary

| Look                      |                            | Write | Check |
|---------------------------|----------------------------|-------|-------|
| tengo...                  | I have...                  |       |       |
| tenemos...                | we have...                 |       |       |
| Estudio                   | I study                    |       |       |
| Estudiamos                | We study                   |       |       |
| A las...                  | At ... o'clock             |       |       |
| lunes                     | Monday                     |       |       |
| martes                    | Tuesday                    |       |       |
| miércoles                 | Wednesday                  |       |       |
| jueves                    | Thursday                   |       |       |
| viernes                   | Friday                     |       |       |
| sábado                    | Saturday                   |       |       |
| domingo                   | Sunday                     |       |       |
| Mi asignatura favorita es | My favourite subject is... |       |       |
| Porque es... / son...     | Because it's...            |       |       |
| Fácil                     | Easy                       |       |       |
| Útil                      | Useful                     |       |       |
| Inglés                    | English                    |       |       |
| Matemáticas               | Maths                      |       |       |
| Mi profe favorito es...   | My favourite teacher is... |       |       |
| Mi profe de informática   | My IT teacher              |       |       |
| Nos ayuda                 | He/she helps us            |       |       |
| Explica bien              | He/she explains well       |       |       |

Vocabulary

| Look                    |                               | Write | Check |
|-------------------------|-------------------------------|-------|-------|
| Simpático/a             | Nice/friendly                 |       |       |
| Mi instituto es         | My school is...               |       |       |
| En mi colegio hay...    | In my school there is/ are... |       |       |
| Me gustaría             | I would like...               |       |       |
| En la foto hay          | In the photo there is...      |       |       |
| Muchas personas         | Lots of people                |       |       |
| Voy a + [infinitive]    | I'm going...                  |       |       |
| Quiero                  | I want...                     |       |       |
| Hacer los deberes       | To do my homework             |       |       |
| Ver la tele             | To watch television           |       |       |
| Ir al parque            | To go to the park             |       |       |
| Estudiar                | To study                      |       |       |
| Jugar con mi móvil      | To play on my phone           |       |       |
| Como                    | I eat                         |       |       |
| Bebo                    | I drink                       |       |       |
| Leo                     | I read                        |       |       |
| Juego al fútbol         | I play football               |       |       |
| Voy al centro           | I go to town                  |       |       |
| Hago deporte            | I do sport                    |       |       |
| Escucho música          | I listen to music             |       |       |
| Juego a los videojuegos | I play video games            |       |       |

| Vocabulary                 |                         |                         |                      |
|----------------------------|-------------------------|-------------------------|----------------------|
| Spanish                    | English                 | Spanish                 | English              |
| Vivo en...                 | I live in...            | Ir al cine              | Go to the cinema     |
| Una casa                   | A house                 | Jugar en el parque      | Play in the park     |
| Un piso                    | A flat                  | Comer en un restaurante | Eat at a restaurant  |
| Está...                    | It is situated          | Visitar el museo        | Visit the museum     |
| Hay...                     | There is / are...       | Pero                    | But                  |
| No hay                     | There isn't / aren't... | Sin embargo             | However              |
| Una cocina                 | A kitchen               | Me gusta vivir aquí     | I like living here   |
| Un cuarto de baño          | A bathroom              | Ruidoso/a               | Noisy                |
| Una cama                   | A bed                   | Aburrido/a              | Boring               |
| Muchos/as                  | Lots of                 | Quiero vivir            | I want to live       |
| Un centro comercial        | A shopping centre       | Me gustaría vivir       | I would like to live |
| Un polideportivo           | A leisure centre        | En el extranjero        | Abroad               |
| Se puede (+ infinitive)    | You can                 |                         |                      |
| No se puede (+ infinitive) | You can't               |                         |                      |

| Vocabulary                 |                         |       |       |
|----------------------------|-------------------------|-------|-------|
| Look                       |                         | Write | Check |
| Vivo en...                 | I live in...            |       |       |
| Una casa                   | A house                 |       |       |
| Un piso                    | A flat                  |       |       |
| Está...                    | It is situated          |       |       |
| Hay...                     | There is / are...       |       |       |
| No hay                     | There isn't / aren't... |       |       |
| Una cocina                 | A kitchen               |       |       |
| Un cuarto de baño          | A bathroom              |       |       |
| Una cama                   | A bed                   |       |       |
| Muchos/as                  | Lots of                 |       |       |
| Un centro comercial        | A shopping centre       |       |       |
| Un polideportivo           | A leisure centre        |       |       |
| Se puede (+ infinitive)    | You can                 |       |       |
| No se puede (+ infinitive) | You can't               |       |       |



Vocabulary

| Look                    |                      | Write | Check |
|-------------------------|----------------------|-------|-------|
| Ir al cine              | Go to the cinema     |       |       |
| Jugar en el parque      | Play in the park     |       |       |
| Comer en un restaurante | Eat at a restaurant  |       |       |
| Visitar el museo        | Visit the museum     |       |       |
| Pero                    | But                  |       |       |
| Sin embargo             | However              |       |       |
| Me gusta vivir aquí     | I like living here   |       |       |
| Ruidoso/a               | Noisy                |       |       |
| Aburrido/a              | Boring               |       |       |
| Quiero vivir            | I want to live       |       |       |
| Me gustaría vivir       | I would like to live |       |       |
| En el extranjero        | Abroad               |       |       |





**YEAR 7**

# Religion



RELIGION LOCALLY AND NATIONALLY  
THE ORIGINS OF ABRAHAMIC FAITHS  
JUDAISM  
CHRISTIANITY



| Key Vocabulary             |                                                                                                                                                                                                                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.diversity                | Differences between a group or setting.                                                                                                                                                                                                                                                                                                  |
| 2. Christianity            | The religion that Christians follow. Christianity is the largest religion in the UK and the world.                                                                                                                                                                                                                                       |
| 3. church (lower case 'c') | church (lower case 'c') – a building in which Christians worship.                                                                                                                                                                                                                                                                        |
| 4. Church (capital 'C')    | Church (capital 'C') – the collective body of Christian believers worldwide or a specific denomination e.g. the Catholic Church or the Church of England.                                                                                                                                                                                |
| 5. Islam                   | The religion that Muslims follow. Islam is the second largest religion in the UK and the world.                                                                                                                                                                                                                                          |
| 6. Judaism                 | The religion that Jewish people follow.                                                                                                                                                                                                                                                                                                  |
| 7. Hindu Dharma            | The religion that Hindus follow.                                                                                                                                                                                                                                                                                                         |
| 8. Sikhi                   | The religion that Sikhs follow.                                                                                                                                                                                                                                                                                                          |
| 9. Buddhism                | The religion that Buddhists follow.                                                                                                                                                                                                                                                                                                      |
| 10. Humanism               | A non-religious tradition followed by Humanists. Humanism is a way of thinking that focuses on people and their well-being, without relying on religion or belief in a god. Humanists believe that everyone deserves to be treated with respect and kindness, and that we should use reason and logic to understand the world around us. |
| 11. census                 | An official survey of the people who live in a country.                                                                                                                                                                                                                                                                                  |
| 12. society                | A group of people who live near each other and share some traditions and ideas.                                                                                                                                                                                                                                                          |

Tools for Studying Religion

**Social sciences** are a group of subjects that are interested in how people live together in a society. Social scientists study how people change society and how society changes them. Social scientists collect data in a range of ways, including surveys like the census, as well as looking at evidence of religion in a community's buildings

| Religious and Non-Religious Symbols and Buildings    |               |                                                                                       |           |
|------------------------------------------------------|---------------|---------------------------------------------------------------------------------------|-----------|
| Follower                                             | Symbol        |                                                                                       | Building  |
| Followers of Christianity are Christians.            | Cross         |    | church    |
| Followers of Judaism are Jewish.                     | Star of David |    | synagogue |
| Followers of Islam are Muslims.                      | Crescent Moon |    | mosque    |
| Followers of Hindu Dharma are Hindus.                | Aum           |    | mandir    |
| Followers of Sikhi are Sikhs.                        | Khanda        |    | gurdwara  |
| Followers of Buddhism are Buddhists.                 | Dharma Wheel  |  | temple    |
| Followers of Humanism are Humanists. (non-religious) | Happy Human   |  | (various) |

| Religious and Non-Religious Symbols and Buildings                                 |                                                                                |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| In 2021,                                                                          | Between 2001 and 2021,                                                         |
| More people described themselves as religious than non-religious                  | The number of people choosing to answer the question about religion increased. |
| The largest religious group was Christianity, followed by Islam and Hindu Dharma. | The number of people reporting 'no religion' increased.                        |
|                                                                                   | The number of people reporting Muslim, Hindu, Sikh and Buddhist increased.     |
|                                                                                   | The number of people reporting Christian decreased.                            |

| Questions                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the largest religion in the UK and the world?                                                                                                                                                                    |
| 2. What is the second largest religion in the UK and the world?                                                                                                                                                             |
| 3. What is an important symbol in Christianity?                                                                                                                                                                             |
| 4. Which key term begins with a capital letter when referring to the collective body/community of Christian believers worldwide, but begins with a lower-case letter when referring to a building where Christians worship? |
| 5. Who are the followers of Islam?                                                                                                                                                                                          |
| 6. What is the building called where Muslims worship, which may also be known as a masjid?                                                                                                                                  |
| 7. What is a non-religious tradition that focuses on people and their well-being, without relying on religion or belief in a god, and that we should use reason and logic to understand the world around us?                |
| 8. In 2021, which was the largest religious group in the UK?                                                                                                                                                                |
| 9. Between 2001 and 2021, did the number of people reporting 'no religion' increase or decrease?                                                                                                                            |
| 10. What is the religion that Jewish people follow?                                                                                                                                                                         |

| Questions                                                                       |
|---------------------------------------------------------------------------------|
| 11. What is an official survey of the people who live in a country?             |
| 12. In 2021, did more people describe themselves as religious or non-religious? |
| 13. Who are the followers of Hindu Dharma (Hinduism)?                           |
| 14. What building do Jewish people worship in?                                  |
| 15. Who are the followers of Christianity?                                      |
| 16. What is the religion that Buddhists follow?                                 |
| 17. Who worships at a mandir?                                                   |
| 18. What symbol represents Sikhi (Sikhism)?                                     |
| 19. Who are the followers of Humanism?                                          |
| 20. What is the key term for the differences between a group or setting?        |

| Key Vocabulary      |                                                                                                                                                                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Abrahamic faith  | One of three faiths that are all linked by Abraham: Judaism, Christianity and Islam.                                                                           |
| 2. Abraham/ Ibrahim | The founder of Judaism; he is a central figure in the Abrahamic religions of Judaism, Christianity, and Islam.                                                 |
| 3.monotheism        | The belief that there is only one God.                                                                                                                         |
| 4. polytheism       | The worship of or belief in more than one god.                                                                                                                 |
| 5. covenant         | An agreement between two sides (between humans and God)                                                                                                        |
| 6. Moses            | Leader who freed the Israelites from slavery and was given the 10 commandments.                                                                                |
| 7. The Torah        | Holiest scripture (sacred/holy writings) for Judaism. The word means “law” in Hebrew. It was written by Moses and is also important in Christianity and Islam. |
| 8. Ten Commandments | Ten rules given to Moses by God about how humans should behave.                                                                                                |
| 9. sin              | An action that is believed to go against the laws of God                                                                                                       |
| 10.idol             | Objects or images that represent gods                                                                                                                          |
| 11. atonement       | Making up for something that someone has done wrong                                                                                                            |
| 12. sacrifice       | To give up something valuable in order to gain something else                                                                                                  |

| The Covenant and the Abrahamic Faiths                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Abraham is a monotheist and worships only one God. God promises to look after Abraham and his descendants because of this, and that his descendants will be a blessing to the world. Abraham has two sons, Isaac (who Moses and Jesus are descended from) and Ishmael (who Muhammad is descended from). Moses is given the Ten Commandments as part of the covenant. Christians believe Jesus is part of the covenant being fulfilled. Muslims believe prophecy is a part of the covenant. |                                                                                                                            |
| Key Vocabulary                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                            |
| 13. Jesus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | The most important figure in Christianity, believed to be the Son of God and God in human form.                            |
| 14. sermon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | A talk about a religious or moral subject given by a leader in the religion                                                |
| 15. Sermon on the Mount                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | A collection of teachings by Jesus covering topics like love, prayer and moral guidance.                                   |
| 16. crucifixion                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | The execution of Jesus, by the Romans, on a cross.                                                                         |
| 17. resurrection                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Coming back to life after someone has died. Christians believe that Jesus rose from the dead.                              |
| 18. prophet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Someone chosen by God to say the things God wants them to tell people (messenger of God).                                  |
| 19. Prophet Muhammad                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | An Arab religious, social, and political leader and the founder of Islam.                                                  |
| 20. Makkah (Mecca)                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Holy city for Muslims established by Ibrahim and Ishmael.                                                                  |
| 21. revelation                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | A message from God to human beings.                                                                                        |
| 22. The Qur’an                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Holiest scripture for Islam. The word means “recite” in Arabic. It was revealed to the Prophet Muhammed.                   |
| 23. theology                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The study of God and ideas about God.                                                                                      |
| 24. theologian                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Someone who studies theology, who might look at how holy texts and ideas about God influence people’s beliefs and actions. |



Questions

- 1. What are the three main Abrahamic faiths?
- 2. What is the key term for an action that is believed to go against the laws of God?
- 3. What is the belief that there is only one God?
- 4. What is the worship of or belief in more than one god known as?
- 5. Which leader freed the Israelites from slavery and was given the 10 commandments by God?
- 6. Who is the founder of Judaism?
- 7. Who is the most important figure in Christianity, believed to be the Son of God and God in human form?
- 8. What is the execution of Jesus, by the Romans, on a cross known as?
- 9. What is the key term for coming back to life after someone has died? (Christians believe that Jesus rose from the dead).
- 10. What is the holiest scripture/holy book for Islam that was revealed to the Prophet Muhammed?

Questions

- 11. What is the holiest scripture (sacred/holy writings) for Judaism, that is also important in Christianity and Islam?
- 12. What is the key term for ‘making up for something that someone has done wrong’?
- 13. What are the objects or images that represent gods known as?
- 14. What is the key term for a message from God to human beings?
- 15. What is an agreement between two sides (between humans and God)?
- 16. What is a collection of teachings by Jesus covering topics like love, prayer and moral guidance?
- 17. What is the key term given to someone chosen by God to say the things God wants them to tell people (messenger of God)?
- 18. Who is an Arab religious, social, and political leader, considered to be the founder of Islam?
- 19. Which of Abraham’s sons are Moses and Jesus descended from?
- 20. Which of Abraham’s sons is Muhammad descended from?

| Key Vocabulary      |                                                                                                                                                                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Abraham          | The founder of Judaism and husband of Sara.                                                                                                                                                                                            |
| 2. covenant         | An agreement between two sides (between humans and God).                                                                                                                                                                               |
| 3. Sara             | Female leader, mother of nations and wife of Abraham.                                                                                                                                                                                  |
| 4. Isaac            | The son of Abraham and Sara.                                                                                                                                                                                                           |
| 5. Moses            | Leader who freed the Israelites from slavery and was given the 10 commandments.                                                                                                                                                        |
| 6. Miriam           | Prophetess who helped her brother Moses lead the Israelites out of slavery.                                                                                                                                                            |
| 7. Exodus           | A book in the Hebrew Bible which tells the story of the Israelites being freed from slavery in Egypt.                                                                                                                                  |
| 8. Ten Commandments | Ten rules given to Moses by God about how humans should behave.                                                                                                                                                                        |
| 9. Esther           | A Jewish queen who saved her people from a plot to destroy them.                                                                                                                                                                       |
| 10. monotheism      | The belief that there is only one God.                                                                                                                                                                                                 |
| 11. prayer          | Prayer is a form of communication between humans and God or a higher power. Sometimes, it can be like a conversation between a person and God, where the believer might thank God, ask God for help, or show love or adoration to God. |
| 12. Shema           | An important Jewish prayer, declaring the oneness of God.                                                                                                                                                                              |
| 13. Messiah         | A future Jewish king who is expected to bring peace.                                                                                                                                                                                   |
| 14. Genesis         | A book in the Bible which describes the creation of the universe and of the first humans, Adam and Eve. Genesis is the first book of the Torah.                                                                                        |
| 15. mitzvot         | 613 rules in the Torah which guide Jews in their behaviour.                                                                                                                                                                            |

| Key Vocabulary      |                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------|
| 16. Tikkun Olam     | “Repairing the world”, encouraging actions that improve society and bring justice.                          |
| 17. synagogue       | A Jewish place of worship, study and community.                                                             |
| 18. bar/bat mitzvah | Coming of age ceremony (bar mitzvah for boys and bat mitzvah for girls).                                    |
| 19. Pesach/Passover | A Jewish holiday/festival, which commemorates the Exodus story.                                             |
| 20. Shabbat         | A day of rest and worship observed from Friday evening to Saturday evening.                                 |
| 21. denomination    | A specific branch or group within a larger religion, each with its own unique set of beliefs and practices. |
| 22. Orthodox        | A branch of Judaism that follows traditional beliefs, laws and practices.                                   |
| 23. Reform          | A branch of Judaism that adapts traditional beliefs, laws and practices to fit modern life.                 |
| 24. prophecy        | A message that is given to a prophet by God.                                                                |

| Holy Books |                                                                                                                                            |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| The Tanakh | Hebrew Bible, which includes three parts: the Torah, Nevi'im and Ketuvim. In Christianity, the Hebrew Bible is known as the Old Testament. |
| The Torah  | Holiest scripture for Judaism. The word means “law” in Hebrew. Written by Moses. Also important in Christianity and Islam.                 |
| Nevi'im    | Contains books of the Prophets, which tell the history of Israel God’s messages through the prophets.                                      |
| Ketuvim    | Contains various writings, including poetry, wisdom literature and historical accounts.                                                    |
| Talmud     | Contains discussions and interpretations of the Torah, which guides Jewish law and practice.                                               |

Questions

1. What is the name for the Hebrew Bible, which includes three parts: the Torah, Nevi'im and Ketuvim?
2. What does the word "Torah" mean in Hebrew?
3. What is the first book of the Torah, which describes the creation of the universe and the first humans, Adam and Eve?
4. In Christianity, what is the Hebrew Bible known as?
5. Who is considered the founder of Judaism?
6. What is the key term for the ten rules given to Moses by God about how humans should behave?
7. Judaism is a monotheistic religion. How many gods do they believe in?
8. What is the name of the book in the Hebrew Bible which tells the story of the Israelites being freed from slavery?
9. What is the key term for a form of communication between humans and God or a higher power (it can be like a conversation between a person and God)?
10. What is the key term for a specific branch or group within a larger religion, each with its own unique set of beliefs and practices?

Questions

11. What is a branch of Judaism that follows traditional beliefs, laws and practices?
12. What is a branch of Judaism that adapts traditional beliefs, laws and practices to fit modern life?
13. What is the key term for a message that is given to a prophet by God?
14. What is an important Jewish prayer, declaring the oneness of God?
15. What is the key term for rules found in the Torah which guide Jews in their behaviour?
16. What is the English translation of the Jewish festival/holiday Pesach, which commemorates the Exodus story?
17. What is the Jewish day of rest and worship observed from Friday evening to Saturday evening?
18. What is the Jewish 'coming of age' ceremony for boys?
19. What is the Jewish 'coming of age' ceremony for girls?
20. How many mitzvot are there?

| Key Vocabulary           |                                                                                                                                                                                                                           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Jesus                 | The most important figure in Christianity, believed to be the Son of God, and God in human form.                                                                                                                          |
| 2. Messiah               | "Anointed One" or "Saviour." One expected to save and lead the people. Christians believe this to be Jesus.                                                                                                               |
| 3. Christ                | Also meaning "Anointed One" or "Saviour." The term 'Christ' is a title given to Jesus; it is not Jesus' surname.                                                                                                          |
| 4. Mary                  | The mother of Jesus.                                                                                                                                                                                                      |
| 5. the Incarnation       | The Christian belief that God took human form as Jesus.                                                                                                                                                                   |
| 6. Christmas             | Christian festival celebrating the birth of Jesus and the Incarnation. On the fourth Sunday before Christmas, a period of time called Advent begins, during which Christians prepare for the celebration of Jesus' birth. |
| 7. ministry              | The work of a religious person.                                                                                                                                                                                           |
| 8. Sermon on the Mount   | A collection of teachings by Jesus covering topics like love, prayer and moral guidance.                                                                                                                                  |
| 9. The Lord's Prayer     | A prayer taught by Jesus to his disciples, summarising key beliefs in the Christian faith.                                                                                                                                |
| 10. parables             | Short stories told by Jesus that could be easily understood but had a deeper meaning hidden within them e.g. Parable of the Sheep and Goats.                                                                              |
| 11. miracles             | Events which seems to go against the laws of nature.                                                                                                                                                                      |
| 12. the Crucifixion      | The execution of Jesus, by the Romans, on a cross.                                                                                                                                                                        |
| 13. the Resurrection     | Jesus rising from the dead three days after his crucifixion.                                                                                                                                                              |
| 14. Easter               | Christian festival celebrating the Resurrection of Jesus. The week before Easter is known as Holy Week.                                                                                                                   |
| 15. the Ascension        | Jesus' ascent to heaven, 40 days after his resurrection.                                                                                                                                                                  |
| 16. Mary Magdalene       | A follower of Jesus who witnessed his resurrection.                                                                                                                                                                       |
| 17. The Great Commission | Jesus' instruction to his followers to spread his teachings to all people.                                                                                                                                                |
| 18. apostles             | The twelve main followers of Jesus who spread his message (also commonly referred to as twelve disciples).                                                                                                                |
| 19. Pentecost            | Christian festival celebrated as the "birthday" of the Christian Church, when the disciples were empowered by the Holy Spirit to begin their mission to spread the teachings of Jesus.                                    |
| 20. St Paul              | An early Christian leader who wrote many letters (epistles) in the New Testament.                                                                                                                                         |

| Key Vocabulary      |                                                                                                                                                                                                     |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 21. Phoebe          | A deaconess mentioned in the New Testament who helped the early Church.                                                                                                                             |
| 22. Lydia           | A businesswoman and early Christian supporter of Paul.                                                                                                                                              |
| 23. Nicene Creed    | A statement of Christian faith.                                                                                                                                                                     |
| 24. Trinity         | The Christian belief in one God in three Persons: Father, Son and Holy Spirit.                                                                                                                      |
| 25. the Reformation | A movement in the 16th century that led to the creation of Protestant Churches.                                                                                                                     |
| 26. denomination    | A specific branch or group within Christianity.                                                                                                                                                     |
| 27. Protestant      | A branch of Christianity that broke away from the Catholic Church during the Reformation.                                                                                                           |
| 28. Catholic        | The largest branch of Christianity, led by the Pope.                                                                                                                                                |
| 29. Pope            | The leader of the Catholic Church.                                                                                                                                                                  |
| 30. salvation       | Being saved from sin and its consequences.                                                                                                                                                          |
| 31. sacrament       | An important ceremony/ritual that represents an important part of the Christian faith. Catholics have seven sacraments, but many Protestants usually focus on two – baptism and Holy Communion.     |
| 32. judgement       | The Christian belief that, after they die, everyone will be judged by God on their faith and actions, ending in a decision about whether a person is worthy of God's reward (heaven) or not (hell). |
| 33. heaven          | Heaven, for many Christians, is a place of eternal paradise, happiness, peace, and closeness to God.                                                                                                |
| 34. hell            | Hell is often thought of as a place of eternal suffering, or a state of being cut off from God completely.                                                                                          |
| 35. purgatory       | A temporary state where some Christians believe souls of people who have died with unforgiven sins are purified (cleansed) before entering heaven.                                                  |

| Holy Books  |                                                                                                                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Bible   | The most important book in Christianity. It is divided into two main parts: the Old Testament, which contains the history and teachings of the Jewish faith, and the New Testament, which focuses on the life, teachings, death and resurrection of Jesus and the early Christian community. |
| The Gospels | Four books in the Bible which contain the accounts of the life of Jesus. They are written by Matthew, Mark, Luke and John.                                                                                                                                                                   |

Questions

- 1. What is a prayer taught by Jesus to his disciples, summarising key beliefs in the Christian faith?
- 2. What is the key term for Jesus’ instruction to his followers to spread his teachings to all people?
- 3. What is the Christian festival that celebrates the birth and the Incarnation of Jesus?
- 4. What is the execution of Jesus, by the Romans, on a cross?
- 5. What is the key term for the Christian belief that Jesus rose again from the dead?
- 6. What is a collection of teachings by Jesus covering topics like love, prayer and moral guidance?
- 7. What is the Christian festival that celebrates the Resurrection of Jesus?
- 8. What are events which seem to go against the laws of nature?
- 9. Who is the mother of Jesus?
- 10. What is the name for the Christian belief in one God in three Persons: Father, Son and Holy Spirit?

Questions

- 11. Who is the most important figure in Christianity, who Christians believe is the Messiah, the Son of God, and God in human form?
- 12. The word Messiah and which other title given to Jesus means "Anointed One" or "Saviour"?
- 13. Who was an early Christian leader who wrote many letters (epistles) in the New Testament?
- 14. What is the key term for a specific branch or group within Christianity?
- 15. What is the most important holy book for Christians?
- 16. What is the largest branch of Christianity, led by the Pope?
- 17. What is the key term for the twelve main followers of Jesus who spread his message (also commonly referred to as twelve disciples)?
- 18. What is a movement in the 16th century that led to the creation of Protestant churches?
- 19. What is the key term for Jesus’ ascent to heaven, 40 days after his resurrection?
- 20. What is the key term for the four books in the Bible which contain the accounts of the life of Jesus, written by Matthew, Mark, Luke and John?





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