

Combined Higher Knowledge quizzes June 2022

Tips:

- Learn one quiz at a time. Cover the right hand side and go through each question, checking the answers as you go.
- Get a friend or family member to quiz you – in random order
- When you are feeling confident, cover the right side and write the answers to all the ones you can, then check.

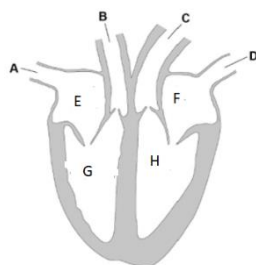
Knowledge quiz 4.1.2

Question	Answer
1. What is the function of the cell membrane?	Control what enters and leaves the cell
2. Where in a cell does respiration take place?	Mitochondria
3. What is the function of the ribosomes?	Making proteins
4. Name 3 structures found in a plant cell but not in an animal cell	Vacuole, chloroplast, cell wall
5. In which part of a plant cell does photosynthesis take place?	Chloroplast
6. What is a prokaryote?	A cell with no nucleus
7. What is the cell wall of plants made of?	Cellulose
8. What is a eukaryote?	A cell that has its DNA in a nucleus
9. What is unique about bacterial cells?	Their DNA is free floating in cytoplasm . not in a nucleus
10. Name the circular ring of DNA found in many bacterial cells	Plasmid
11. What is the function of the cytoplasm?	Where many chemical reactions take place
12. What is stored in the vacuole of plant cells?	Sap
13. What is the function of the nucleus?	Contains the DNA
14. What are chromosomes made of?	DNA
15. In body cells, the chromosomes are found in.....	Pairs
16. What are the 3 stages of the cell cycle?	Interphase, mitosis, cytokinesis
17. What happens during interphase?	All the DNA is copied and so are all cell organelles like mitochondria, ribosomes etc
18. What happens during mitosis?	The chromosomes move to opposite sides, the nucleus divides
19. What happens during cytokinesis?	The cytoplasm and cell membranes divide
20. Why is mitosis important?	Growth and repair
21. What is a stem cell?	An unspecialized cell capable of becoming any type of cell
22. What is the name of the source of stem cells in plants?	Embryos
23. What type of cells can be obtained from stem cells in bone marrow?	Blood cells
24. Name two diseases that could be treated using stem cells	Paralysis and diabetes
25. What is the main source of stem cells from which all other cells can be made?	Meristem
26. What is a 'cloned' cell?	A cell that is identical to the parent cell
27. What is therapeutic cloning?	When the patients DNA is inserted into an egg cell to create embryonic stem cells that match the patients DNA
28. What is the advantage of being treated with cloned cells?	Less chance of rejection
29. Name one risk associated with cloned cells	Transfer of viral infections
30. Name 2 benefits of cloning plants	Producing crop plants with better yields, protecting plants from extinction

Question	Answer
1. What are the 7 components of food?	Carbohydrates, proteins, fats, water, vitamins, minerals and fibre
2. Which food component provides us with most of our energy?	Carbohydrates
3. What is protein needed for in the diet?	Growth and repair
4. In which organ does digestion begin?	Mouth
5. What is an enzyme?	A protein that acts as a catalyst
6. Why does food need to be digested?	So that small soluble molecules can get across the membrane of the small intestine into the blood
7. Which enzyme is produced in the mouth?	Amylase
8. Which is the only enzyme found in the stomach?	Protease
9. Name two organs that produce and release all 3 digestive enzymes	Pancreas and small intestine
10. When amylase acts on starch, what is produced?	Glucose
11. What is produced when proteins are broken down?	Amino acids
12. Which enzyme digests proteins?	Protease
13. Which enzyme digests fats?	Lipase
14. What are the two products when fats are broken down?	Fatty acids and glycerol
15. Where is bile made?	Liver
16. Where is bile stored?	Gall bladder
17. What are the 2 functions of bile?	Neutralize stomach acid to produce the right conditions for the enzymes in the small intestine Emulsify fats (provide a larger surface area)
18. What is the function of stomach acid?	Kill bacteria in food
19. What chemical is used to test for starch?	Iodine
20. What is the colour change in the chemical named in Q19 if starch is present?	Brown to blue black
21. Which chemical is used to test for protein?	Biuret
22. Describe what you would see in a positive test for protein	Colour change from blue to purple/lilac
23. What colour is Benedicts solution?	Blue
24. What is Benedicts used to test for?	Glucose
25. What is the colour change in Benedicts if the test is positive?	Blue to brick red
26. What are the small molecules produced in digestion used for?	To build new carbohydrates, fats or proteins in the body. Glucose is used in respiration
27. How can the Benedicts test be heated safely?	Using a water bath
28. How can foods be tested for the presence of fat?	Add equal volumes of ethanol and water – if the water goes cloudy, fats are present
29. Name a food that is a good source of carbohydrate	Potatoes, rice, pasta, bread
30. What type of foods are good sources of protein?	Meat, fish, cheese, pulses

4.2.2.2 and 4.2.2.3



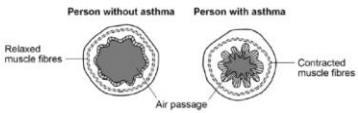
Question	Answer
1. What is the name of the top chambers of the heart?	Left and right atrium
2. What are the two bottom chambers called?	Left and right ventricles
3. Which blood vessels carry blood away from the heart?	Arteries
4. Why is the heart known as a 'double pump'?	Because the left side pumps to the body and the right side pumps to the heart
5. What is the name of the artery leaving the left ventricle to take blood to the whole body?	Aorta
6. Why are the valves in the heart?	To keep blood flowing one way and stop backflow
7. Where is the pacemaker located?	Right atrium
8. What is the name of the arteries that supply the heart itself with blood?	Coronary arteries
9. What is the name of the artery leaving the right ventricle to take blood to the lungs?	Pulmonary artery
10. What is the name of the blood vessel that brings blood to the heart from the body?	Vena cava
11. What is the name of the blood vessel that brings blood back from the lungs to the heart?	Pulmonary vein
12. What is the name of the main airway from the mouth to the lungs?	Trachea
13. The two airways that lead into the lungs are called....	Bronchi
14. Where in the lungs does gas exchange take place?	Alveoli
15. What are the 4 components of blood?	Plasma, platelets, red blood cells, white blood cells
16. Which part of the blood carries dissolved substances?	Plasma
17. What is the function of the red blood cells?	Carry oxygen
18. How are the red blood cells adapted for their function?	They have no nucleus and lots of haemoglobin
19. What is the function of the white blood cells?	Detect and destroy pathogens
20. What are the platelets for?	Clotting blood
21. Which blood vessels contain valves?	Veins
22. Which blood vessels have a strong elastic wall and thick layer of muscle to ensure blood is under high pressure?	Arteries
23. Which blood vessels have walls that are only one cell thick?	Capillaries
24. Which blood vessels carry blood under low pressure back to the heart?	Veins
25. How is the blood on the left side of the heart different from the blood on the right?	The blood on the left is higher in oxygen and lower in carbon dioxide



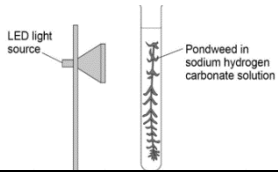
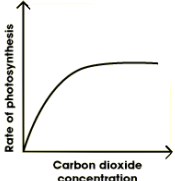
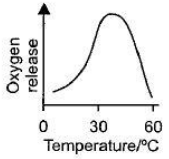
- AVena Cava
- Bpulmonary artery.....
- CAorta.....
- DPulmonary vein.....

- ERight atrium.....
- Fleft atrium.....
- Gright ventricle.....
- Hleft ventricle.....

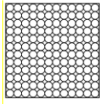
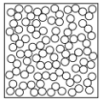
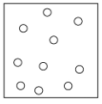

4.2.2.4 - 4.2.2.6

Question	Answer
1. What is health?	The state of physical and mental well-being
2. What is a non-communicable diseases?	A disease NOT caused by a pathogen and therefore cannot be passed from person to person
3. Name 3 lifestyle factors that are linked with cardiovascular disease	Smoking, diet, exercise
4. Which two organs are affected by alcohol?	Liver and brain
5. Name a risk factor for Type 2 diabetes	Obesity
6. What is a carcinogen?	Something capable of causing cancer
7. What is cancer?	Uncontrolled cell division
8. What is a benign tumour? 	One that will not spread around the body
9. Why do benign tumours not spread around the body?	Because they are contained within a membrane
10. What is a malignant tumour? 	One that is capable of spreading around the body
11. How do bits of malignant tumours spread around the body?	In the bloodstream
12. Name some risk factors for cancer	Genetics, diet, smoking, ionizing radiation
13. What happens during an asthma attack?	The airways (bronchi and bronchioles) constrict
14. Which virus is linked with cervical cancer?	HPV
15. Name 2 diseases linked to obesity	Heart disease and type 2 diabetes
16. Which parts of the body are affected by asthma?	Airways (trachea, bronchi, bronchioles)
17. Why do people with asthma often struggle to breathe? Use the diagram below to help explain. 	Less air can flow in and out of the lungs
18. Name two lifestyle factors that can be a risk to unborn babies	Smoking, alcohol
19. Name a risk factor for skin cancer	Ultraviolet radiation (UV) from the sun
20. Name a risk factor for lung cancer	Smoking
21. What is coronary heart disease?	Build up of fatty tissue in the coronary arteries
22. What is a heart attack?	When the coronary arteries are blocked meaning blood cannot get to the heart so it is deprived of oxygen for respiration
23. How do stents reduce the risk of another heart attack?	They open up the artery and restore blood flow
24. What do statins do?	They reduce cholesterol levels in the blood
25. What is the problem caused by faulty heart valves?	Blood may flow the wrong way in the heart – ie back into the atria

4.4.1

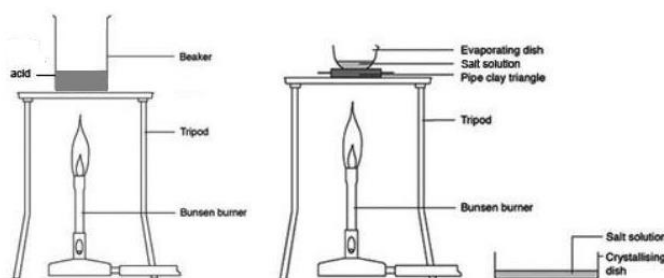
Question	Answer
1. What are the reactants in photosynthesis?	Carbon dioxide and water
2. What are the products in photosynthesis?	Glucose and oxygen
3. Write the symbol equation for photosynthesis	Carbon dioxide + water → glucose + oxygen
4. Why is photosynthesis an endothermic reaction?	Energy is needed (transferred by light)
5. Where in the plant cells does photosynthesis take place?	Chloroplasts
6. Name the factors that affect the rate of photosynthesis	Temperature, light intensity, carbon dioxide concentration, concentration of chlorophyll
7. Which substance found in the chloroplasts is needed for photosynthesis to take place?	Chlorophyll
<p>Questions 8 – relate to this investigation which aims to test the hypothesis ‘The rate of photosynthesis depends on the light intensity’</p> <div style="text-align: center;">  </div>	
8. How can the rate of photosynthesis be measured using the equipment shown?	Counting the number of bubbles per minute
9. How could the light intensity be changed?	Move the lamp further away
10. What factors would need to be controlled to ensure a valid conclusion?	Temperature, plant, carbon dioxide conc
11. How could temperature be controlled?	Using a water bath (DON'T just say 'using a thermometer)
12. Why is an LED light used instead of a normal bulb?	LED lamps don't get hot
13. How many distances should be measured?	Minimum of 5
14. Why is the plant in sodium hydrogen carbonate solution instead of just water?	To provide carbon dioxide
15. Describe the relationship shown:	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>As the carbon dioxide concentration increases, so does the rate of photosynthesis, but only up to a point, when even if the concentration is increased the rate remains constant</p> </div> </div>
16. Describe the relationship shown:	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>As the temperature increases, the rate of photosynthesis increases, but only up to about 40°C. After that, an increase in temperature causes the rate to decrease</p> </div> </div>
17. What is a limiting factor?	A factor that is in the shortest supply and is therefore limiting the rate of photosynthesis
18. Why might a farmer not use artificial heat or lights above a certain level?	It may cost too much for not enough of an increase in photosynthesis rate
19. How can a distance be converted into 'light intensity' using the inverse square law?	Light intensity = $1/d^2$
20. What is aerobic respiration?	Release of energy from glucose using oxygen
21. Write the equation for aerobic respiration in animals	Glucose + oxygen → carbon dioxide + water
22. What is anaerobic respiration?	Release of energy without oxygen
23. Write the equation for anaerobic respiration in animals	Glucose → lactic acid
24. Write the equation for anaerobic respiration in plant and yeast cells	Carbon dioxide → ethanol + carbon dioxide
25. What is anaerobic respiration in yeast called?	fermentation

Chemistry 5.2.2

Question	Answer
1. What does an (s) in an equation mean?	Solid (insoluble)
2. What state of matter is represented by (l)?	Liquid
3. How would a gas be represented in an equation?	(g)
4. What two changes of state can happen at the melting point?	Melting and freezing
5. What two changes of state can happen at the boiling point?	Boiling and condensing
6. What does (aq) mean?	Aqueous solution – dissolved in water
7. What forces of attraction are found in ionic compounds?	Electrostatic
8. Why are the melting and boiling points of ionic compounds so high?	The electrostatic forces are strong so it takes lots of energy to overcome all of them in the ionic lattice
9. Name a limitation with using the particle model shown below: <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;">  <p>Solid</p> </div> <div style="text-align: center;">  <p>Liquid</p> </div> <div style="text-align: center;">  <p>Gas</p> </div> </div>	<ul style="list-style-type: none"> There are no forces shown between the particles No movement is shown Particles are represented as solid spheres
10. Why are carbon dioxide and oxygen gases at room temperature?	Because their boiling point is lower than room temperature (they are simple covalent molecules)
11. Why do small molecules have low melting and boiling points?	The forces between the molecules are weak and don't need much energy to overcome
12. What happens to melting and boiling points as molecules get bigger and why is this?	They increase
13. Why do simple covalent molecules not conduct electricity?	The molecules have no overall charge
14. What sort of bonding is found in polymers?	Covalent
15. Why are polymers normally solids at room temperature?	Because they are large molecules so the forces of attraction are fairly strong
16. What sort of structures are diamond, graphite and silica examples of?	Giant covalent structures
17. Why do they have high melting and boiling points?	Lots of energy is needed to break all the strong covalent bonds
18. What sort of bonding is found in metals like gold and silver?	Metallic
19. Why do metals conduct electricity?	Because they have delocalized electrons that are able to move through the metal
20. Why are pure metals easily bent and shaped?	The layers of atoms are able to slide over each other easily
21. What is an alloy?	A mixture of metals
22. Why are alloys stronger than pure metals?	Because the layers are disrupted so they cannot slide
23. How many other carbon atoms is each carbon bonded to in diamond?	4
24. Why is diamond hard?	Giant structure of very strong covalent bonds
25. How many covalent bonds does each carbon make in graphite?	3
26. Why does graphite conduct electricity?	It has delocalized electrons that can move through the graphite
27. Why is graphite slippery?	Graphite is in layers and they are able to move over each other
28. What is graphene?	A single layer of graphite
29. What type of molecules are based on hexagonal rings of carbon atoms?	Fullerenes
30. What type of structure is shown in the diagram: <div style="text-align: center; margin-top: 10px;">  </div>	nanotube

Question	Answer
1. What is oxidation?	Combining with oxygen OR loss of electrons
2. What is reduction?	Loss of oxygen OR gain of electrons
3. What makes one metal more reactive than another?	How easily it forms an ion
4. Which element is used to extract less reactive metals from their ores?	Carbon
5. What are the products when metals react with acids?	Salt and hydrogen gas
6. What is produced when acids react with bases?	Salt and water
7. What is an alkali?	A soluble base – contains OH ⁻ ions
8. What type of salt is formed if hydrochloric acid is neutralized?	Chloride
9. What type of salt is formed if sulfuric acid is neutralized?	Sulfate
10. What type of salt is formed if nitric acid is neutralized?	Nitrate
11. How can soluble salts be obtained from solutions?	Crystallization / evaporation
12. Which particle makes a solution acidic?	H ⁺
13. Which particle makes a solution alkaline?	OH ⁻
14. Write the ionic equation for neutralization	H ⁺ + OH ⁻ → H ₂ O
15. What is the range of pH in the pH scale?	0-14
16. How can pH be measured?	Using universal indicator or a pH probe
17. What is the pH of a neutral solution?	7
18. What is the pH of an acid?	0-6.9
19. What is the pH of an alkali?	7.1-14
20. What is a strong acid?	One that fully ionizes/dissociates in solution
21. Why do weak acids have higher pH than strong ones?	They do not fully dissociate in solution and weaker acids have a pH closer to 7
22. When the pH changes by 1, what is the change in H ⁺ ion concentration?	X 10

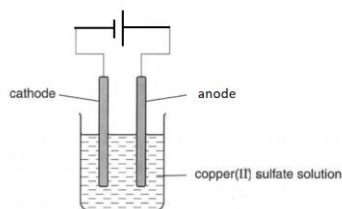
Q 23 –31 relate the equipment below which can be used to make copper chloride



23. Which acid should be used?	Hydrochloric (to give a chloride)
24. Why is the acid heated?	To speed up the reaction
25. Name a suitable base to neutralize the acid	Copper oxide or copper carbonate
26. Why can copper metal not be used?	Copper does not react with acids
27. Why is the base added in excess?	To make sure the acid is fully neutralized
28. How would you know when the base is in excess?	Solid collects at the bottom of the beaker
29. How could the excess base be removed?	Filter
30. How would the salt be obtained from the solution?	Crystallization / evaporation
31. Name a piece of equipment that the dish could be placed in to crystallise the solution safely	Drying oven

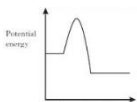
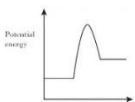
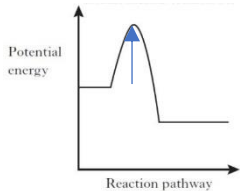
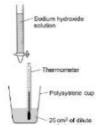
Question	Answer
1. Why can ionic compounds conduct electricity when molten or in solution?	The IONS can move
2. Why can ionic compounds NOT conduct electricity when they are solids?	The ions are unable to move as they are stuck in the lattice
3. What is an electrolyte?	A solution or liquid that is able to conduct electricity
4. What is electrolysis?	Splitting (NOT separating) a compound using electricity
5. What is the name of the negative electrode?	Cathode
6. What is the name of the positive electrode?	Anode
7. What happens to positive ions at the cathode?	They gain electrons (reduced) to become atoms
8. What happens to negative ions at the anode?	They lose electrons (oxidized) to become atoms
9. What is the gain of electrons called?	reduction
10. Which metals are extracted by electrolysis?	Metals that are too reactive to be reduced using carbon
11. Why does electrolysis use a lot of energy?	Lots of energy is needed to melt ionic compounds and then the production of the electric current
12. Why is graphite used in the electrodes?	Because it has delocalized electrons that can move and so it conducts electricity
13. Why is cryolite added to aluminium oxide before electrolysis?	To lower the melting point
14. What is formed at the cathode in the electrolysis of aluminium oxide?	Aluminium
15. What is the product at the anode in the electrolysis of aluminium oxide?	Oxygen
16. Why do the anodes need to be continually replaced?	The oxygen produced reacts with the carbon electrodes to make carbon dioxide
17. What does (aq) mean?	Dissolved in water – an aqueous solution
18. Which ions are also present if an ionic compound is dissolved in water and then electrolysed?	H ⁺ and OH ⁻ ions
19. Why does hydrogen form at the cathode when solutions are electrolysed?	If the metal in the solution is more reactive than hydrogen, then hydrogen will be released
20. What is formed at the anode if solutions are electrolysed?	Oxygen or, if a halogen is present, the halogen (group 7 element)
21. What is the ionic equation for the formation of oxygen at the anode?	$4\text{OH}^- - 4\text{e}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O}$

Questions 22-27 are about the following equipment, used to electrolyse a solution of copper sulphate

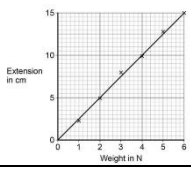
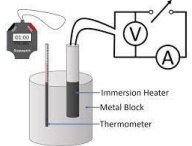
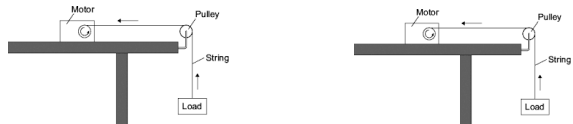


22. Complete the diagram to label the other electrode and to complete the supply of electricity	
23. Which ions are present in the solution?	Cu^{2+} H^+ SO_4^{2-} OH^-
24. What will be formed at the cathode and why?	Copper – as it less reactive than hydrogen
25. What will be formed at the anode and why?	Oxygen – there is no halogen present
26. Name a solution that could be used instead of copper sulphate to produce hydrogen at the cathode	Potassium sulphate (substitute any metal that is more reactive than copper)
27. Name a solution that could be used instead of copper sulphate to produce chlorine at the anode	Copper chloride

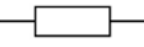

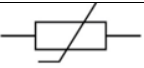
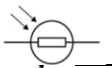

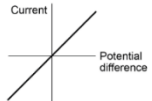
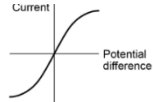
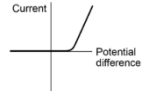
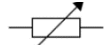
5.5.1

Question	Answer								
1. What is activation energy?	The minimum amount of energy needed to get a reaction started								
2. What is an exothermic reaction?	One in which energy is transferred to the surroundings								
3. Give 3 examples of exothermic reactions	Combustion, neutralization, oxidation reactions								
4. Give an everyday use of exothermic reactions	Self heating cans and hand warmers								
5. What is an endothermic reaction?	One in which energy is transferred from the surroundings to the reaction								
6. Give 2 examples of endothermic reactions	Photosynthesis, thermal decomposition								
7. What is energy needed for in a reaction?	In order to break bonds in the reactants								
8. When is energy released during a reaction?	When new bonds are made in the products								
9. When is a reaction exothermic overall?	If more energy is released when bonds are made than was needed to break bonds								
10. When would a reaction be endothermic overall?	When more energy was required to break bonds than was released when bonds were made								
11. How do you use a bond energy table like the one below to calculate the energy transferred? $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$ <table border="1" data-bbox="231 907 598 1008"> <thead> <tr> <th>Bond</th> <th>Average Bond Energy / kJmol^{-1}</th> </tr> </thead> <tbody> <tr> <td>H-H</td> <td>+ 436</td> </tr> <tr> <td>I-I</td> <td>+ 151</td> </tr> <tr> <td>H-I</td> <td>+ 298</td> </tr> </tbody> </table>	Bond	Average Bond Energy / kJmol^{-1}	H-H	+ 436	I-I	+ 151	H-I	+ 298	Add up the energy used in breaking bonds and subtract the amount of energy released when bonds are made in the products, e.g: $436 + 151 = 587$ required $2 \times 298 = 596$ released $587 - 596 = -9\text{kJ}$
Bond	Average Bond Energy / kJmol^{-1}								
H-H	+ 436								
I-I	+ 151								
H-I	+ 298								
12. What type of reaction is represented by the diagram shown: 	Exothermic								
13. What type of reaction is represented by the diagram shown: 	Endothermic								
14. Draw an arrow on the diagram to represent the activation energy	 <p>Do NOT just draw an arrow pointing to the tip of the slope</p>								
Questions 15 – 19 relate to the equipment below which can be used to investigate the variables that affect temperature change by testing 'The temperature change in the solution depends on the volume of sodium hydroxide added'									
15. Why is a polystyrene cup used for the reaction instead of a beaker?	To reduce energy transfers (don't say 'stop')								
16. How could energy losses be reduced further?	Put a lid on the cup								
17. If the reaction is exothermic, what will happen to the temperature?	It will increase								
18. A digital temperature probe can be used instead of a thermometer. How could this affect the readings' a) accuracy b) resolution	a) It would increase the accuracy as the digital readout is easier to read b) resolution could be increased if the probe can measure to 1 or two decimal places								
19. Name 3 control variables for the experiment	Concentration of both acid and alkali, volume of acid, starting temperature of the liquids (NOT the 'temperature of the room')								

6.1.1 and specific heat RP

Question	Answer
1. Name the 8 energy stores	Kinetic, magnetic, nuclear, electrostatic, gravitational potential, elastic potential, chemical, thermal
2. Which energy store is filled when an object is lifted upwards?	Gravitational potential
3. Which energy store is filled when an elastic object is stretched or squashed?	Elastic potential
4. Which energy store is filled when an object is moving?	Kinetic
5. If an object falls from a height, which energy store decreases?	Gravitational potential
6. If an object falls from a height, which energy store fills?	Kinetic
7. During an energy transfer, which store is filled when energy is 'wasted' or dissipated?	Thermal store of the environment
8. What unit should mass always be in for a calculation?	Kilograms
9. What is the unit for velocity?	m/s
10. What sort of relationship is shown by the graph:	Directly proportional
	
11. What is the specific heat capacity?	The amount of energy needed to raise the temperature of 1Kg of a substance by 1°C
Q 12 – 16 relate to the equipment below, which is used to calculate the specific heat capacity of the block. 	
12. How is the mass of the block measured?	Using a balance / weighing scales
13. Why is water placed in the hole with the thermometer?	To improve the contact with the block (air is an insulator)
14. What is the heater for?	To transfer energy to the block
15. Why would the value calculated for specific heat capacity using this method be much higher than the true value?	A lot of energy is transferred from the block to the thermal store of the environment
16. Name one improvement to the method.	Insulate the block
17. What is power?	The rate at which energy is transferred
18. What is the unit for power?	Watts (W)
19. What is 1 Watt equivalent to in joules?	1 joule per second
20. If the motors shown below both lift the same object, but one is more powerful, what would be the difference?	One would lift faster
	

6.2.4 and IV characteristics RP

Question	Answer
1. What is electricity?	A flow of charge
2. What is current?	The rate of flow of charge
3. What are the units for current?	Amps (A)
4. What are the units for charge?	Coulombs
5. What is this component? 	Fixed or ohmic resistor
6. What is this component? 	Diode
7. What is this component? 	Thermistor
8. What is this component? 	Light dependent resistor (LDR)
9. What is this component? 	Light emitting diode (LED)
10. What is the unit for potential difference?	Volts (V)
11. What is the unit for resistance?	Ohms (Ω)
12. What is the relationship shown: 	Directly proportional
13. Which component gives the relationship shown in Q 12?	Fixed/ohmic resistor
14. Which component gives this relationship in a circuit: 	Filament lamp
15. Why does the current stop increasing even when the pd increases in a filament bulb?	The resistance increases as the bulb gets hot
16. Which component gives this relationship: 	Diode
17. What happens to resistance in a thermistor as the temperature increases?	The resistance decreases
18. What happens to resistance in a light dependent resistor when light intensity increases?	The resistance decreases
19. How does a diode only allow current in one direction?	It has very high resistance in the other direction
20. Which component is shown : 	Variable resistor
21. What is the National Grid?	A series of cables and transformers for transferring electricity
22. What do 'step up transformers' do?	Increase the potential difference
23. What is the advantage of carrying electricity at such high voltages?	The current can be kept low which reduces energy losses in wires (they don't get as hot)
24. What is the pd into homes?	230 V
25. What two factors affect how much energy is transferred by an electrical appliance?	The power of the appliance and how long it is used for ($e = p \times t$)

6.3.1 and 6.3.3

Question	Answer
1. Which state of matter has particles in ordered neat rows that are all touching?	Solid
2. Which states of matter cannot be compressed (squashed)	Solid
3. What words can be used to describe the arrangement of the particles in a gas?	Far apart, random
4. In which state of matter is the attraction between the particles the strongest?	Solid
5. Why does 1Kg of a solid take up less space than a Kg of gas?	The particles are all close together in a solid, whereas in a gas they are spread out
6. Why are liquids and gases able to flow?	The attraction between the particles is weak so they are able to move around each other
7. Name the change of state when a liquid turns into a gas	Evaporation
8. Name the change of state when a gas turns into a liquid	Condensation
9. Which change of state occurs when a solid melts?	Melting
10. What happens to the temperature of a substance while a change of state happens?	It remains constant
11. What happens to the mass of a substance during a change of state?	It remains constant
12. What are the units for mass?	Kg
13. What are the units for volume?	cm ³ or m ³
14. What are the units for density?	Kg/m ³
15. Name the change of state when a solid turns straight into a gas	Sublimation
16. How should the particles in a solid be drawn?	In neat rows, all touching
17. How should the particles in a liquid be drawn?	Randomly, but all touching
18. How should the particles in a gas be drawn?	Randomly, and spaced far apart
19. What name is given to the temperature at which a solid turns into a liquid or a liquid turns into a solid?	Melting point
20. What term is given to the temperature at which a liquid turns into a gas or a gas turns back into a liquid?	Boiling point
21. What determines the temperature of a substance?	The kinetic energy of the particles in the substance
22. If you increase the temperature of a gas in a container, what happens to the pressure?	Pressure increases
23. What causes the pressure in a container of gas?	Collision of the particles with the walls of the container
24. Why does pressure decrease if you cool a gas?	The kinetic energy of the particles decreases, so collisions are less frequent and less forceful

6.4.1 and 6.4.2

Question	Answer
1. How big is an atom?	1×10^{-14} m
2. How much smaller is the nucleus than the atom?	10, 000 x smaller (or 4 orders of magnitude)
3. What can cause electrons to move further from the nucleus?	If the atom absorbs EM radiation
4. What can cause electrons to move closer to the nucleus?	If the atom emits EM radiation
5. What is an isotope?	An atom with the same number of protons but different number of neutrons
6. Before electrons were discovered, what were atoms thought to be like?	Tiny spheres that could not be divided into anything smaller
7. What is the order of discovery of the sub atomic particles?	Electron, proton, neutron
8. What was the major change to the atomic model from Rutherford's scattering experiment?	That the positive charge was contained in a small nucleus at the centre of the atom, not spread throughout
9. What made Rutherford think that the atom was mostly empty space?	Most of the alpha particles passed straight through the gold leaf
10. What evidence made Rutherford think that the positive charge was contained in a tiny nucleus?	Only a very small number of alpha particles were deflected or reflected back
11. What is radioactive decay?	When an atom emits particles and/or energy from its nucleus in order to become stable
12. What is the rate at which decay takes place known as?	Activity
13. What is activity measured in?	Becquerels (Bq)
14. Name the 4 main types of radiation	Alpha, beta, gamma, neutron
15. What does an alpha particle consist of?	2 protons and 2 neutrons
16. Which structure does an alpha particle resemble?	A helium nucleus
17. What is a beta particle?	An electron
18. How is a beta particle formed?	A neutron splits into a proton and an electron
19. What is a 'gamma ray'?	An EM wave from the nucleus
20. Which of the types of radiation has the shortest range in air (can travel least far)	Alpha
21. Which one can travel the furthest?	Gamma
22. Which type of radiation is the most ionizing?	Alpha
23. Which type of radiation is the most penetrating?	Gamma
24. What is 'half life'?	The time it takes for the count rate to fall to half its initial value or the time taken for half of the atoms in a sample to decay
25. In nuclear equations, what are the two ways an alpha particle can be represented?	${}^4_2\text{He}$ OR ${}^4_2\alpha$
26. How is a beta particle represented in nuclear equations?	${}^0_{-1}\text{e}$ OR ${}^0_{-1}\beta$
27. What is radioactive contamination?	The unwanted presence of radioactive atoms
28. What determines the level of hazard from contamination?	The type of radiation they emit (whether alpha, beta, etc) and where the contamination is (breathed in, on skin etc)
29. What is irradiation?	Exposure to one of the types of radiation – e.g alpha, beta, gamma etc
30. Why is it important that any findings on the effects of radiation on humans are published?	So they can be checked by other scientists

