

Science | Science fundamentals | Year 10 | Spring 2

Week 1	Week 2	Week 3
<ol style="list-style-type: none"> Name 5 subcellular structures that both plant and animal cells have What 3 things do plant cells have that animal cells don't? What is cell differentiation? Which gives a higher magnification and resolution, electron or light microscopes? What is diffusion? 	<ol style="list-style-type: none"> What are the relative charges, masses and locations of the 3 subatomic particles? What is the name of the separation technique you would use to separate an insoluble solid from a liquid? State 3 trends as you go down group 1 What do elements in the same group have in common? How can we work out numbers of protons, electrons and neutrons in atoms? 	<ol style="list-style-type: none"> Write down the 8 energy stores Write down the 4 energy transfers What is the conservation of energy principle? Give 4 ways to prevent unwanted heat transfer in the home Name 4 renewable energy resources and 4 non-renewable energy resources
Week 1 answers	Week 2 answers	Week 3 answers
<ol style="list-style-type: none"> Nucleus, cell membrane, mitochondria, cytoplasm, ribosomes Vacuole, chloroplasts, cell wall When a cell changes to becomes specialised for its job Electron microscopes give a higher resolution and magnification Diffusion is the passive movement of particles, along a concentration gradient – from high to low concentration 	<ol style="list-style-type: none"> Protons +1, 1, Nucleus. Electron -1, almost zero, electron shells, Neutron 0, 1, nucleus Filtration Melting and boiling points decrease, metals become more soft, metals become more reactive Same number of electrons in the outer shell and similar properties Proton number is the same as the atomic number (on the P table), Electrons are the same as the protons, and the neutrons are mass number minus atomic number 	<ol style="list-style-type: none"> Thermal, kinetic, gravitational potential, elastic potential, chemical, magnetic, electrostatic, nuclear Electrical, mechanical, radiation, thermal Energy cannot be created or destroyed, only transferred between energy stores Double glazing, cavity walls, loft insulation, draught excluders Renewable – solar, hydroelectric, geothermal, wind, wave, tidal. Non-renewable – oil, coal, gas, nuclear

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Week 4	Week 5	Week 6
<ol style="list-style-type: none"> 1. Define tissue 2. What does it mean when an enzyme has been denatured? 3. What are the 3 main food groups and what do they break down into? 4. What is the test for starch? 5. What conditions affect enzyme activity? 	<ol style="list-style-type: none"> 1. What is an ion? 2. What type of ion do metals / non-metals form? 3. How do ionic bonds form? 4. How do covalent bonds form? 5. Explain why graphite can conduct electricity 	<ol style="list-style-type: none"> 1. Define power and give 2 calculations to calculate power 2. Explain why solar power would be considered to be fairly reliable, but wind power would not 3. Give 2 ways in which the environment can be damaged from the use of fossil fuels 4. How do we calculate efficiency? 5. What is the unit for energy?
Week 4 answers	Week 5 answers	Week 6 answers
<ol style="list-style-type: none"> 1. Tissues are groups of similar cells working together to perform a specific function. 2. The active site has changed shape and the enzyme no longer works 3. Carbohydrates break down into glucose, lipids break down into fatty acids and glycerol, proteins break down into amino acids 4. Iodine turns blue/black when starch is present 5. pH that is too far from the optimum, high temperatures denature enzymes and low temperatures inhibit the enzyme 	<ol style="list-style-type: none"> 1. An ion is an atom that has lost or gained electrons 2. Metals form positive ions, non-metals form negative ions 3. Ionic bonds form when a metal gives a non-metal one or more electrons. Both form ions 4. Covalent bonds form when 2 non-metal atoms share a pair of electrons 5. Graphite has delocalised electrons that can move and carry a flow of charge 	<ol style="list-style-type: none"> 1. Power is the rate of doing work. $P = E/t$, $P = W/t$ 2. Solar power is available every day, the sun always rises. It is not always windy and is sometimes too windy. 3. Release of CO_2 causing global warming, mining for coal and oil damages habitats 4. Useful energy output / total energy input 5. Joules (J)