Memory Workout – Common Entrance 13+ Science



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| NAME: | Links minners | I I | | | | $\overline{}$ |
|---|---|-----|---|-----------------|--|---------------|
| Which piece of scientific equipment can be used to observe cells? | Light microscope | | | | | |
| Name the labelled parts in the diagram | A – eyepiece lens | | | | | + |
| below: | B – coarse focussing wheel | | | | | |
| | C – fine focussing wheel | | | | | |
| a // | D – mirror/light | | | | | |
| | E – objective lens | | | | | |
| e e | F – stage | | | | | |
| | G – slide | | | | | |
| | | | | | | |
| b C f | | | | | | |
| | | | | | | |
| g | | | | | | |
| đ | | | | | | |
| | <u> </u> | | | | | \perp |
| What are the two key differences | Electron microscope has: | | | | | |
| between a light microscope and an | Higher magnification (more zoom) | | | | | |
| electron microscope | Higher resolution (more detail) The second se | ++ | 1 | $\vdash \vdash$ | | + |
| What is a cell? | The smallest structural unit in an | | | | | |
| What is a tissue? | organism | | | | | + |
| | Cells of the same type joined together | + + | | | | + |
| Give two examples of tissue types in humans. | Muscle Taith slip! (to a lover of skip) | | | | | |
| numans. | Epithelial (top layer of skin)Connective | | | | | |
| | | | | | | |
| What is an organ? | Nervous Tissues of different types joined together | | | | | + |
| Give five examples of organs in humans. | Heart | | | | | + |
| dive five examples of organs in numaris. | • Lungs | | | | | |
| | Kidneys | | | | | |
| | • Liver | | | | | |
| | Brain | | | | | |
| | • Stomach | | | | | |
| | • Intestines | | | | | |
| Give two examples of organs in plants. | Leaves | | | | | + |
| | • Stem | | | | | |
| | • Root | | | | | |
| | • Flower | | | | | |
| What is an organ system? | A number of organs working together | | | | | + |
| Give two examples of organ systems in | Digestive system | | | | | _ |
| humans. | Gas exchange system | | | | | |
| | Circulatory system | | | | | |
| | Nervous system | | | | | |
| Give two examples of organ systems in | • Shoots | | | | | \top |
| flowering plants. | • Roots | | | | | |
| Name the four organelles in an animal | Nucleus | | | | | |
| cell. | Cytoplasm | | | | | |
| | Mitochondria | | | | | |
| | Cell membrane | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Name the seven organelles in a plant cell. | NucleusCytoplasmMitochondria | | | | |
|--|--|--|--|--|---|
| | Cell membraneCell wallVacuole | | | | |
| | | | | | |
| NA/hatiatha walaaftha waxalaya? | • Chloroplasts | | | | + |
| What is the role of the nucleus? | Contains genes which control the | | | | |
| M/h a la a cara a cara de a CO | production of proteins in the cell. | | | | + |
| What are genes made of? | DNA | | | | - |
| What is the role of the cytoplasm? | It is a jelly-like substance in which most of the chemical reactions take place. | | | | |
| What is the role of the mitochondria? | It is where aerobic respiration takes place. | | | | |
| What is the role of the cell membrane? | It controls which substances enter and leave the cell. | | | | |
| What is the role of the cell wall? | It provides structure for the cell. | | | | |
| What is the role of the vacuole? | It stores cell sap. | | | | |
| What is the role of the chloroplasts? | It is where photosynthesis takes place. | | | | |
| What is the role of a stain (e.g. methylene | Highlighting certain organelles (e.g. | | | | |
| blue or iodine solution)? | nucleus) when cells are viewed under a microscope | | | | |
| Which stain is used for cheek cells? | Methylene blue | | | | + |
| | lodine solution | | | | - |
| Which stain is commonly used for plant cells? | Todine Solution | | | | |
| What is the definition of diffusion? | The movement of particles from an area of higher concentration to an area of lower concentration. | | | | |
| Describe how oxygen moves from the air into cells. | Oxygen is inhaled and enters the lungs. It diffuses out of the lungs into the bloodstream. It is carried around the body in the blood. It diffuses out of the blood into cells. | | | | |
| Describe how carbon dioxide moves from cells into the air | Carbon dioxide diffuses out of cells into the bloodstream. It is carried back to the lungs in the blood. It diffuses out of the blood into the lungs. It is exhaled from the lungs. | | | | |
| Describe how glucose moves from the small intestines into cells. | Glucose diffuses out of the small intestines (through the villi) into the bloodstream. It is carried around the body in the blood. It diffuses out of the blood into cells. | | | | |
| How are the lungs adapted to allow fast diffusion of gases? | Alveoli increase the surface area Alveoli have a wall one cell thick (decreases the diffusion distance) Good blood supply (maintains the concentration gradient) | | | | |

| How are the small intestines adapted to allow fast diffusion of nutrients? | Villi increase the surface area Villi have a wall one cell thick (decreases the diffusion distance) Good blood supply maintains the concentration gradient | |
|--|--|--|
| How are gases exchanged in leaves? | The stomata open and close allowing | |
| | gases to enter and leave | |

| | T | | - | | - 1 | |
|--|--|--|---|---|-----|-------|
| In which organ does gas exchange | The lungs | | | | | |
| happen most frequently? | | | | | | |
| What is the term used to describe the | Inspiration | | | | | |
| intake of gases? | | | | | | |
| What is the term used to describe the | Expiration | | | | | |
| outflow of gases? | | | | | | |
| What is the trachea? | The tube connecting the mouth/nose to | | | | | |
| | the lungs | | | | | |
| What are the alveoli? | The air sacks which increase the surface | | | | | |
| | area of the lungs. | | | | | |
| What is the diaphragm? | A dome-shaped muscle found below the | | | | | |
| | lungs. | | | | | |
| | | | | | | |
| | | | | | | |
| Identify each labelled part of the diagram | A – trachea | | | | | |
| below: | B – alveoli | | | | | |
| | C – bronchioles | | | | | |
| | D – bronchi | | | | | |
| 4 | E – ribs | | | | | |
| a | F – intercostal muscles | | | | | |
| b——— | G – diaphragm | | | | | |
| | | | | | | |
| | | | | | | |
| C | | | | | | |
| d | | | | | | |
| | | | | | | |
| e | | | | | | |
| f g | | | | | | |
| What is the effect of the diaphragm | The pressure in the chest is reduced and | | | | | |
| contracting (moving down)? | therefore air is drawn into the lungs. | | | | | |
| What is the effect of the diaphragm | The pressure in the chest is increased and | | | | | |
| relaxing (moving up)? | therefore air is forced out of the lungs. | | | | | |
| What is the role of the rib cage? | To protect the lungs and other organs in | | | 1 | | |
| | the chest. | | | | | |
| What is the role of the intercostal | They allow the volume of the chest to | | | | | |
| muscles? | increase, providing more space for the | | | | | |
| | lungs to expand. | | | | | |
| | | | | | | 1 |

Biology – Gas exchange systems

| | | | | | | |
|---|---|------|------|------|---|--|
| What is vital capacity a measure of? | The maximum volume of air that can be | | | | | |
| | breathed in and out with the deepest | | | | | |
| | breath a patient can manage. | | | | | |
| How could lung volume be measured? | By exhaling air through a tube into an | | | | | |
| | unturned bottle filled with water. The | | | | | |
| | volume of water displaced can then be | | | | | |
| | measured. | | | | | |
| How does asthma affect the gas | Asthma causes the trachea to get | | | | | |
| exchange system? | narrower, meaning that it is harder to | | | | | |
| | inhale air. | | | | | |
| How does an inhaler help in treating | An inhaler causes the lining of the | | | | | |
| asthma | trachea to relax, widening the passage. | | | | | |
| Name 3 impacts of smoking on the gas | Lung cancer | | | | | |
| exchange system. | Heart disease | | | | | |
| | Reduced lung surface area | | | | | |
| What are the names of the blood vessels | Arteries | | | | | |
| which carry blood away from the heart? | | | | | | |
| What are the names of the blood vessels | Veins | | | | | |
| which carry blood towards the heart? | | | | | | |
| How are red blood cells adapted to | No nucleus – more space from | | | | | |
| carrying oxygen? | carrying oxygen | | | | | |
| | Biconcave shape – provides a larger | | | | | |
| | surface area | | | | ı | |
| What is the function of the red blood | To carry oxygen around the body | | | | | |
| cells? | | | | | | |
| What is the function of the white blood | To fight diseases | | | | | |
| cells? | | | | | | |
| | | | | | | |

| M/hat is the word equation for earthic | Change Lower Awater Learban | T | 1 | | - 1 | | |
|--|--|-------------------|---|---|-----|---|---|
| What is the word equation for aerobic respiration? | Glucose + oxygen → water + carbon dioxide | | | | | | |
| In which part of the cell does aerobic | Mitochondria | ++ | | | | | |
| respiration take place? | Mitocrionaria | | | | | | |
| What is the purpose of respiration? | The release of energy from glucose | | | | | | |
| What is the difference between breathing | Breathing is the inspiration and | | | | | | |
| and respiration? | expiration of gases (using the lungs) | | | | | | |
| | Respiration is a chemical reaction | | | | | | |
| | involving glucose and oxygen | | | | | | |
| By what process to gases move between | Diffusion | | | | | | |
| the lungs and the blood? | | | | | | | |
| How are the lungs adapted for gas | Alveoli increase the surface area | | | | | | |
| exchange? | A good blood supply maintains the | | | | | | |
| | concentration gradient | | | | | | |
| | Alveoli have walls one cell thick – | | | | | | |
| | smaller diffusion distance | | | | | | |
| | A moist layer allows gases to dissolve | ++ | | | | | |
| How can we test for carbon dioxide? | Bubbling the gas through limewater. It | | | | | | |
| | will turn from colourless to cloudy white | | | | | | |
| | if carbon dioxide is present. | ++ | | | | | |
| How will the composition of exhaled air | Inhaled air will contain more oxygen | | | | | | |
| compare to the composition of inhaled | (~20%) and less carbon dioxide (~0.06%) | | | | | | |
| air? What is difference between aerobic and | Appropriation does not require | + | | | | | |
| | Anaerobic respiration does not require | | | | | | |
| anaerobic respiration? What is the equation for anaerobic | oxygen. Glucose → lactic acid | ++ | | | | | |
| respiration in animals (including | Glucose 7 lactic acid | | | | | | |
| humans)? | | | | | | | |
| Does anaerobic respiration release more | Much less | 11 | | | | | |
| of less energy than aerobic respiration? | | | | | | | |
| What is the issue with producing lactic | It is a mild poison which causes cramp in | | | | | | |
| acid? | the muscles. | | | | | | |
| What is the effect of exercise on | More exercise = higher breathing rate | | | | | | |
| breathing rate? | | | | | | | |
| Explain why your breathing rate increases | It increases the amount of oxygen | ++ | | | | - | + |
| during exercise. | reaching your lungs and the amount of | | | | | | |
| daring exercise. | carbon dioxide being removed from your | | | | | | |
| | lungs. | | | | | | |
| What is the effect of exercise on heart | More exercise = higher heart rate | ++ | + | | | - | |
| rate? | 5 | | | | | | |
| Explain why your heart rate increases | More oxygen and glucose must be | $\dagger \dagger$ | | | | + | + |
| during exercise. | delivered to cells to allow respiration to | | | | | | |
| | happen more quickly, releasing more | | | | | | |
| | energy. | | | | | | |
| Explain why anaerobic respiration is | You cannot transport oxygen quickly | $\dagger \dagger$ | | | | | |
| necessary during hard exercise? | enough to your cells. | | | | | | |
| , 5 | <u>. </u> | | | 1 | | | |

Biology – cellular respiration

| Why do we continue to breathe fast and | To transport oxygen to our cells to break | | | | |
|--|---|--|--|--|--|
| have a high heart rate after exercise? | down lactic acid (oxygen debt). | | | | |
| What is the word equation for the | Oxygen + lactic acid → water + carbon | | | | |
| breakdown of lactic acid? | dioxide | | | | |
| What is the equation for anaerobic | Glucose → carbon dioxide + ethanol | | | | |
| respiration in plants and yeast? | | | | | |
| What is yeast used for? | Baking (production of carbon dioxide | | | | |
| | causes the bread to rise) | | | | |
| | Brewing beer (production of ethanol | | | | |
| | makes the beer alcoholic) | | | | |

| | | | | - | 1 | 1 | |
|--|---|----------|---|---|---|---|------|
| What is the word equation for | Carbon dioxide + water → glucose + | | | | | | |
| photosynthesis? | oxygen | | | | | | |
| What is also required for photosynthesis | Light | | | | | | |
| to take place? | | | | | | | |
| In which part of a plant does | The leaves | | | | | | |
| photosynthesis take place? | | | | | | | |
| In which part of a plant cell does | Chloroplast | | | | | | |
| photosynthesis take place? | | | | | | | |
| What is the name of the substance inside | Chlorophyll | | | | | | |
| the chloroplast which allows | | | | | | | |
| photosynthesis to take place? | | | | | | | |
| What three things happens to the glucose | It is converted to starch for storage | | | | | | |
| after it has been made? | It is used in respiration | | | | | | |
| | It is used for growth to become cell | | | | | | |
| | walls, seeds or fruits | | | | | | |
| Which four factors may affect the rate of | | \vdash | + | + | 1 | | |
| Which four factors may affect the rate of | Light intensity Consentration of each an displication | | | | | | |
| photosynthesis? | Concentration of carbon dioxide | | | | | | |
| | Temperature | | | | | | |
| | Volume of water (although this is less | | | | | | |
| | important) | | | | | | |
| What is the effect of increasing the light | It will increase | | | | | | |
| intensity on the rate of photosynthesis? | | | | | | | |
| What is the effect of increasing the | It will increase | | | | | | |
| concentration of carbon dioxide on the | | | | | | | |
| rate of photosynthesis? | | | | | | | |
| What is the effect of increasing the | It will increase at first, but if it gets too | | | | | | |
| temperature on the rate of | hot it will decrease and stop | | | | | | |
| photosynthesis? | • | | | | | | |
| How can a leaf be tested for carrying out | Boil it in water to kill it | | | | | | |
| photosynthesis? | Put it into boiling ethanol to remove | | | | | | |
| priotosynthesis. | the chlorophyll (green colour) | | | | | | |
| | | | | | | | |
| | - | | | | | | |
| M/hat mis as of a suitane and as uld be used | if starch is present | | | - | | | |
| What piece of equipment could be used | A gas syringe | | | | | | |
| for measuring the volume of gas | Or | | | | | | |
| produced during photosynthesis? | An unturned measuring cylinder filled | | | | | | |
| | with water | | | | | | |
| Suggest three reasons that plants are so | They produce oxygen which is | | | | | | |
| important to life on Earth. | essential for life on Earth | | | | | | |
| | They provide biomass which is used | | | | | | |
| | by animals as food | | | | | | |
| | They remove carbon dioxide from the | | | | | | |
| | atmosphere which prevents global | | | | | | |
| | warming and the Earth becoming too | | | | | | |
| | hot | | | | | | |
| | | | | | | | |
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| Suggest three ways in which leaves are adapted for photosynthesis. What is the name of vessels which transport water through the plant? What is the name of vessels which transports sugars through the plant? How are leaves adapted to prevent | Large flat shape increases surface area for absorbing sunlight Stomata (holes on the bottom of the leaf) allow gases to enter and leave Large spaces between cells allow gases to diffuse Palisade cells contain lots of chloroplasts to absorb more light Xylem Phloem Waxy layer on top | | | | |
|---|---|--|--|--|--|
| excessive water loss? | Stomata open and close allowing water to be trapped if it is too hot | | | | |
| Which part of the plant absorbs water? | Roots (root hair cells) | | | | |
| How are root hair cells adapted for taking in lots of water? | They have a large surface area | | | | |
| Apart from water, what else do the roots absorb? | Mineral ions (especially nitrates, but also magnesium, potassium, calcium and phosphate) | | | | |
| What are nitrate ions used for in a plant? | Making proteins | | | | |
| Which elements are found in nitrate ions? | Nitrogen and oxygen | | | | |
| What are magnesium ions used for in plants? | Producing chlorophyll | | | | |
| What can farmers add to their fields if there are not enough nutrients in the soil? | Fertilisers | | | | |
| What are 3 issues with the use of fertilisers? | They can run off into rivers causing: Excessive growth of algae Polluted drinking water Death of fish and other animals | | | | |
| What do we call the process of adding and removing carbon from the atmosphere? | The carbon cycle | | | | |
| Which process add carbon (as carbon dioxide) to the atmosphere? | RespirationCombustionDecomposition (by bacteria and fungi) | | | | |
| Which process removes carbon from the atmosphere? | Photosynthesis | | | | |

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|---|---|-----|----------|---|---|---|--|
| Name the labelled parts of the | A – stigma | | | | | | |
| reproductive system in flower plants: | B – style | | | | | | |
| 1a | C – ovary | | | | | | |
| X - X - | D – ovule | | | | | | |
| 3 | E – anther | | | | | | |
| b | F – filament | | | | | | |
| | | | | | | | |
| t | | | | | | | |
| do / | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| What is the male reproductive organ | Stamen | | | | | | |
| called in a plant? | Author and file | + | - | + | + | | |
| Which parts make up the male | Anther and filament | | | | | | |
| reproductive organ in a plant? | Carnol | + | | - | | | |
| What is the female reproductive organ | Carpel | | | | | | |
| called in a plant? Which parts make up the female | Stigma, style, overviand overla | + | \dashv | + | + | | |
| reproductive organ in a plant? | Stigma, style, ovary and ovule | | | | | | |
| What is the name for the transfer of | Pollination | | | + | | | |
| pollen to the stigma of a flowering plant? | | | | | | | |
| By which two main methods does | Insect pollination | | | + | | | |
| pollination occur? | Insect pollinationWind pollination | | | | | | |
| What is the role of the petals in flowering | To attract insects | | | | | | |
| plants? | TO attract insects | | | | | | |
| What is the role of the sepals in flowering | To protect the plant's reproductive | | | | | | |
| plants? | system | | | | | | |
| What is the male gamete in plants? | Pollen | | | | | | |
| What is the female gamete in plants? | Eggs | | | | | | |
| Describe how fertilisation occurs in | Pollen travels from the stigma down the | | | | | | |
| flowering plants. | style. It then enters the ovule and | | | | | | |
| | combines with the egg. | | | | | | |
| What is formed following fertilisation of | A seed | | | | | | |
| an egg cell? | | | | | | | |
| What is the scientific word for 'spreading | Dispersal | | | | | | |
| out seeds'? | | | | | | | |
| By which methods can seed dispersal | By wind | | | | | | |
| take place? | By animals | | | | | | |
| | By explosion | | | | | | |
| | By water | | | | | | |
| Why is it important for seeds to be | To avoid competition for | | | | | | |
| dispersed? | water/light/other resources | | | | | | |
| | | | | | | | |
| How are seeds which use dispersal by | They have a parachute or wings to allow | | | | | | |
| wind adapted? | them to travel further | | | | | | |
| | | | | | | | |
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| | | | | | | | |

Biology – reproduction in plants

| | | , . | | , | | |
|--|--|-----|------|---|----------|--|
| How are seeds which use dispersal by animals adapted? How are seeds which use dispersal by water adapted? | They have sweet flesh to encourage animals to eat them A hard seed coat to avoid the seed being digested Brightly coloured skin to attract animals The outside (husk) is made of fibres which trap air. This helps them to float. | | | | | |
| What three things are required for | Water | | | | \dashv | |
| | | | | | | |
| germination to occur? | Oxygen | | | | | |
| | Warmth | | | | | |
| Name the labelled parts of the | A – food store | | | | | |
| germinating seed: | B – seed coat | | | | | |
| | C – shoot embryo | | | | | |
| a | D – root embryo | | | | | |
| What are the stages involved in | Water softens the seed coat | | | | | |
| germination? | The food store dissolves in the water | | | | | |
| | and reacts with oxygen, releasing | | | | | |
| | energy | | | | | |
| | Roots and shoots start to form | | | | | |
| | Shoots break through the soil and can | | | | | |
| | start to photosynthesise | | | | | |
| | start to priotosynthesise | | | | | |

| What are the names of each labelled part | A – bladder | | | | |
|--|--|--|--|--|---|
| of the male reproductive system: | B – penis | | | | |
| | C – sperm duct | | | | |
| (ca) | D – urethra | | | | |
| | E – testis | | | | |
| b d | F – scrotum | | | | |
| | G – foreskin | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| What is the role of each of the following: | Bladder – stores urine | | | | |
| Bladder | Sperm duct – transports sperm from | | | | |
| Sperm duct | the testes to the urethra | | | | |
| Urethra | Testis – produces and stores sperm | | | | |
| • Testis | Scrotum – expands and contracts to | | | | |
| Scrotum | control to temperature of the testis | | | | |
| | | | | | |
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| | | | | | |
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| | | | | | |
| What are the names of each labelled part | A – ovary | | | | |
| of the female reproductive system: | B – oviduct (fallopian tube) | | | | |
| | C – uterus | | | | |
| | D – cervix | | | | |
| a c | E – vagina | | | | |
| | | | | | |
|) d (| | | | | |
| | | | | | |
| | | | | | |
| 6 | | | | | |
| | | | | | |
| What is the role of each of the following: | Ovary – develops and releases eggs | | | | |
| Ovary | Oviduct – contains cilia (small hairs) | | | | |
| Oviduct | which sweep eggs towards the uterus | | | | |
| • Uterus | Uterus – where the baby will develop | | | | |
| Cervix | Cervix – holds the baby in place | | | | |
| CELVIA | during pregnancy | | | | |
| What is the scientific term for 'sex cells'? | Gametes | | | | |
| In humans, what is the male gamete? | Sperm | | | | |
| | | | | | |
| In humans, what is the female gamete? What is the term used to describe the | Ovum (egg) | | | | - |
| | Fertilisation | | | | |
| process of fusing the nuclei of the male | | | | | |
| and female gametes? | Zvacto | | | | |
| What is the scientific term for a fertilised | Zygote | | | | |
| egg cell? | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| How are sperm cells adapted for their role? | They have a flagellum (tail) for swimming They have a streamlined shape They have an acrosome which contains enzymes for entering the egg cell They have lots of mitochondria to provide energy They have a nucleus with half the number of chromosomes | | | | |
|---|---|--|--|--|--|
| How are egg cells adapted for their role? | They contain a large glucose store to provide energy during the first part of growth The cell membrane hardens once a sperm has entered to egg to prevent multiple sperm entering They have a nucleus with half the number of chromosomes | | | | |
| How many chromosomes are there in gametes? | 23 | | | | |
| How many chromosomes are there in normal body cells? | 46 (23 pairs) | | | | |
| How many days does a menstrual cycle normally last for? | Between 24 and 28 days | | | | |
| What happens at the beginning of the menstrual cycle? | Menstruation – the lining of the uterus is broken down giving the woman her period | | | | |
| What follows this stage? | The lining of the uterus starts to rebuild and an egg develops inside one of the ovaries. | | | | |
| On which day of the menstrual cycle is an egg released? | Day 14 | | | | |
| What happens after the egg is released? | The egg travels down the oviduct towards the uterus | | | | |
| If the egg is fertilised, what will happen? | It will implant on the wall of the uterus and begin to divide | | | | |
| If the egg is not fertilised, what will happen? | The lining of the uterus will break down and the egg will be passed out along with it. The cycle restarts. | | | | |
| What is the term used for the period in which a fetus is growing inside the uterus? | Gestation | | | | |
| How long is the gestation period in humans? | Nine months | | | | |
| How is the fetus protected whilst inside the uterus? | It is suspended in the amniotic fluid (inside the amniotic sac) | | | | |
| How does the fetus get nutrients whilst in the uterus? | Nutrients are transported through the placenta, and then carried in the umbilical cord which attaches the mother to the fetus. | | | | |

Biology – reproduction in animals

| What is the potential impact of the mother drinking alcohol during pregnancy? | Premature birth, low birth weight and brain disorders | | | | |
|---|---|--|--|--|--|
| What is the potential impact of the mother smoking during pregnancy? | Premature birth, low birth weight and heart/breathing problems | | | | |
| How are waste products (e.g. carbon dioxide) excreted by the fetus? | The waste products travel through the umbilical cord, pass across the placenta, and are then excrete by the mother. | | | | |
| Whose blood flows inside the umbilical cord? | The fetus' | | | | |
| What changes take place in the body during puberty? | Grow more body hair Penis enlarges (in men) Voice deepens (in men) Menstrual cycle starts (in women) Breasts develop (in women) Hormones (testosterone in men and oestrogen in women are produced) | | | | |

| What are the seven substances required by the body (5 are nutrients, 2 are not)? | Carbohydrates Protein Fats (lipids) Vitamins Minerals Fibre (not a nutrient) Water (not a nutrient) | | | | |
|--|--|--|--|--|--|
| What are the two main types of carbohydrate? | Sugar and starch | | | | |
| What is the role of carbohydrates in the body? | Energy (sugar – quick release, starch – slow release) | | | | |
| What is the role of protein in the body? What is the role of lipids in the body? | Growth and repair of body tissue Energy, insulation, and protection of organs | | | | |
| What is the role of fibre in the body? | Keeps food moving through the body preventing constipation | | | | |
| What is the role of water in the body? | Regulates temperature and maintains other bodily functions. | | | | |
| What are the roles of the follow minerals: • Calcium • Iron | Calcium – strengthens bones and teeth Iron – used in the production of red blood cells | | | | |
| What are the roles of the following vitamins: • Vitamin A • Vitamin C | Vitamin A – maintains good eyesight and healthy skin Vitamin C – growth and repair of tissues and strengthens the immune system | | | | |
| What food is a good source of the following nutrients: | Starch – pasta, rice, bread Sugar – Chocolate, fruit Protein – Meat, beans, eggs Lipids – Cheese, crisps Water – Milk, fruit juice Calcium – Dairy products Iron – red meat, beans, spinach Vitamin C – Citrus fruits | | | | |
| What is the consequence of a lack of vitamin C in the diet? | Scurvy – causes bleeding gums | | | | |
| What is the consequence of a lack of calcium in the diet? | Rickets – soft/weak bones and stunted growth | | | | |
| Describe the test for starch. | lodine turns from orange/brown to blue/black | | | | |
| Describe the test for glucose. | Benedict's solution turns from blue to yellow/orange/red when heated. | | | | |
| Describe the test for fat | Rub the food on filter paper. If it turns translucent, fat is present. | | | | |
| Describe the test for protein | Biuret solution turns from blue to purple | | | | |

| III Lililia | D the Cond do the start to be a f | | | | | \neg | \neg |
|--|--|----------|---|--|----------|----------------|--------|
| How could the amount of energy | Burn the food underneath a test-tube of | | | | | | |
| contained in a food be determined? | water. | | | | | | |
| | Measure the temperature rise of the | | | | | | |
| | water. | | | | | | _ |
| Suggest two variables which should be | Same mass of food | | | | | | |
| controlled during this investigation. | Same distance from test tube | | | | | | |
| | Same volume of water | | | | | | |
| | Same starting temperature of water | | | | | | |
| Which substances break down food | Enzymes | | | | | | |
| chemically? | | | | | | | |
| Which enzyme breaks down starch? | Amylase | | | | | | |
| What is starch broken down into? | Simple sugars | | | | | | |
| What is the consequence of taking in too | Weight loss | | | | | | |
| little energy? | | | | | | | |
| What is the consequence of taking in too | Weight gain (and ultimately obesity) | | | | | | |
| much energy? | | | | | | | |
| What is the difference between | Starvation is a lack of food | | + | H | | \dashv | + |
| starvation and malnutrition? | Malnutrition is a lack of certain nutrients. | | | | | | |
| State the names of the organs (in order) | Mouth | | | | | - | + |
| involved in the digestion of food. | • Esophagus | | | | | | |
| angestion of room | • Stomach | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | Large intestine | | | | | | |
| | Rectum | | | | | | |
| | • Anus | | | | | _ | |
| What happens in the mouth? | Food is ingested and then broken down | | | | | | |
| | mechanically by the teeth and chemically | | | | | | |
| | by enzymes in the saliva | | | | | | |
| | | | - | | | | _ |
| What are the four main kinds of teeth? | • Incisors | | | | | | |
| | Canines | | | | | | |
| | Pre-molars | | | | | | |
| | Molars | | | | | | |
| What is the role of each kind of tooth: | Incisors – cutting food | | | $ \ $ | Ī | | |
| Incisors | Canines – tearing food | | | | | | |
| • Canines | Prep-molars – tearing and crushing | | | | | | |
| Pre-molars | food | | | | | | |
| Molars | Molars – grinding food | | | | | | |
| What happens in the stomach? | Food is compressed by the contracting | | | | \dashv | $\neg \dagger$ | + |
| | stomach wall. Bacteria are killed by | | | | | | |
| | stomach acid. | | | | | | |
| What is the effect of plaque on teeth? | Plaque provides a breeding-ground for | | | | + | + | + |
| gara and an eagle on teeth | bacteria, causing tooth decay | | | | | | |
| What happens in the small intestine? | Nutrients diffuse into the bloodstream | | + | H | \dashv | \dashv | + |
| The happens in the small intestine. | through the villi | | | | | | |
| What happens in the large intestine? | Excess water is removed | | + | \vdash | \dashv | + | + |
| What happens in the rectum and the | Faeces is stored and then egested | \vdash | | | 1 | + | + |
| anus? | i deces is stored and then egested | | | | | | |
| alius: | | | | | | L | |

| What is the definition for the word | A state of complete mental physical and | | | | | | |
|---|--|----------|---|---|--|---|---|
| | A state of complete mental, physical and | | | | | | |
| 'health'? | social wellbeing. It is not merely the | | | | | | |
| | absence of infirmity (illness). | | | | | | |
| What is the scientific definition for the | A substance taken into the body that | | | | | | |
| word 'drug'? | modifies or affects chemical reaction | | | | | | |
| | inside the body | | | | | | |
| What are some of the short-term risks of | Impaired judgement | | | | | | |
| drinking alcohol? | Dehydration | | | | | | |
| What are some of the risks to health of | Liver damage | | | | | | |
| drinking larger amounts of alcohol? | Heart disease | | | | | | |
| | Obesity (it can contain lots of energy) | | | | | | |
| | Damage to sex organs | | | | | | |
| What are some of the risks to health of | Paranoia | | | | | | |
| taking recreational drugs such as | Memory loss | | | | | | |
| marijuana? | Addiction | | | | | | |
| Which three harmful chemicals are found | Carbon monoxide | | | | | | |
| in cigarette smoke? | Nicotine | | | | | | |
| iii cigarette sirioke: | Tar | | | | | | |
| Why is earlien manayida harmful? | | | | - | | - | |
| Why is carbon monoxide harmful? | It binds to your red blood cells preventing | | | | | | |
| | them from transporting oxygen around | | | | | | |
| | your body | | | | | | |
| Why is nicotine harmful? | It is addictive, making you crave more | | | | | | |
| | cigarettes | | | | | | |
| Why is tar harmful? | It reduces the surface area of your lungs, | | | | | | |
| | reducing gas exchange. | | | | | | |
| What are some elements of a healthy | A balanced diet | | | | | | |
| lifestyle? | Exercise | | | | | | |
| | Positive social interactions | | | | | | |
| What are some of the key benefits of | Reduces obesity | | | | | | |
| exercise? | Increases strength | | | | | | |
| | Improves heart and lung function | | | | | | |
| What is the definition for a non-infectious | A disease which cannot be passed from | | | | | | |
| (or non-communicable) disease? | one organism to another. | | | | | | |
| Give two examples of non-infectious | Cancer | | | | | | |
| diseases. | Heart disease | | | | | | |
| | Diabetes | | | | | | |
| | Lung disease | | | | | | |
| What is the definition for an infectious | A disease which can be passed from one | | | | | | |
| disease? | organism to another. | | | | | | |
| What are infectious diseases caused by? | Pathogens (disease causing organisms) | \vdash | + | + | | | + |
| What are the four types of pathogen? | Bacteria | \vdash | + | + | | _ | + |
| what are the rour types or pathogen: | | | | | | | |
| | | | | | | | |
| | - | | | | | | |
| Cive two evernles of diseases as and diseases | | | + | - | | | + |
| Give two examples of diseases caused by | Plague Chalana | | | | | | |
| bacteria. | • Cholera | | | | | | |
| | Tuberculosis | | | | | | |
| | | | | | | | |
| | | | | | | | |

| Give two examples of diseases caused by | ● Flu | | | | |
|---|---|--|--|--|---|
| viruses. | | | | | |
| viruses. | • HIV | | | | |
| | • Herpes | | | | |
| How to viruses reproduce? | They attach to a body cell | | | | |
| | The viral genes instruct the cell to | | | | |
| | make copies of the virus | | | | |
| | The cell bursts causing the copied | | | | |
| | viruses to escape | | | | |
| How do bacteria reproduce? | By binary fission | | | | |
| | The bacterial cells divide | | | | |
| | approximately every 30 minutes | | | | |
| How can pathogens be spread? | In food and water | | | | |
| | In the air | | | | |
| | Through bodily fluids (blood or sexual | | | | |
| | fluids) | | | | |
| | Through animal vectors (e.g. | | | | |
| | mosquitos) | | | | |
| What physical defences does the body | • Skin | | | | |
| have against pathogens? | Cilia and mucus | | | | |
| | Blood clots | | | | |
| What chemical defences does the body | White blood cells | | | | |
| have against pathogens? | Lysozymes (enzymes in tears which | | | | |
| | break down bacteria) | | | | |
| Which pathogens can be controlled using | Bacteria | | | | |
| antibiotics? | | | | | |
| Suggest two things that we can | Maintain good hygiene (hand- | | | | _ |
| personally do to act as a defence against | washing, tooth brushing etc.) | | | | |
| disease. | Eat a balanced diet | | | | |
| uisease. | Take regular exercise | | | | |
| | Resting | | | | |
| | Not smoking or drinking excessive | | | | |
| | volumes of alcohol | | | | |
| What are the responsibilities of a | Providing medical care | | | | _ |
| community in preventing disease? | Removing rubbish | | | | |
| community in preventing disease: | Providing safe drinking water | | | | |
| | Maintaining high standard of health | | | | |
| | | | | | |
| | and hygiene in businesses | | | | |

| What type of diagram is used to describe | A food chain | | | | \top |
|--|---|--|--|--|--------|
| the feeding links between different | 7.1500 5.16 | | | | |
| organisms? | | | | | |
| What does an arrow represent in a food | The transfer of energy from one organism | | | | |
| chain? | to another | | | | |
| What happens to the amount of energy | It decreases | | | | |
| transferred as you move through a food | Tr decreases | | | | |
| chain? | | | | | |
| Suggest three reasons the energy | Organisms use some energy for | | | | |
| transferred will decrease? | movement | | | | |
| transferred will decrease. | Organisms use some energy for | | | | |
| | keeping warm | | | | |
| | Organisms may reproduce and | | | | |
| | transfer energy in growing their | | | | |
| | offspring | | | | |
| Why are there normally no more than 4 | There is insufficient energy remaining to | | | | |
| or 5 levels in a food chain? | be transferred | | | | |
| What are the different levels in a food | Trophic levels | | | | |
| chain called? | · | | | | |
| What is the term used to describe the | Producer | | | | |
| first organism in a food chain? | | | | | |
| From where to producers get their | The sun – through photosynthesis | | | | |
| energy? | | | | | |
| What is a herbivore? | An organism which feeds on plants | | | | |
| What is a carnivore? | An organism which feed on the flesh of | | | | |
| | other animals | | | | |
| What is an omnivore? | An organism which eats both plants and | | | | |
| | meat | | | | |
| | | | | | |
| Put these organisms into a food chain: | Corn → Mouse → Snake → Hawk | | | | |
| Mouse | | | | | |
| Hawk | | | | | |
| Snake | | | | | |
| Corn | | | | | |
| What would be the effect on each of the | The population of hawks would fall – less | | | | |
| other organisms of all of the snakes | prey | | | | |
| catching a disease and dying? | The population of mice would increase – | | | | |
| | less predators | | | | |
| | The population of corn would fall – more | | | | |
| | predators (mice) | | | | |
| What type of diagram is used to describe | Food webs | | | | |
| interlinked food chains? | | | | | 1 |
| What is the name | Pyramid of numbers | | | | |
| for this type of Woodpecker (Secondary consumer) | | | | | |
| diagram? | | | | | |
| (Primary consumer) | | | | | |
| - | | | | | |
| Oak tree (Producer) | | | | | |

| Why may it be a problem to introduce a new species into an ecosystem? | It is difficult to know what effect it will have on the food web. Native species may die out. | | | | |
|---|--|--|--|--|--|
| What piece of equipment may be used to estimate the population of plants or small, slow moving animals? | A quadrat | | | | |
| How should a quadrat be used to estimate population in an area? | Place the quadrat randomly in the area. Count the number of organisms of that species inside the quadrat Repeat this a number of times and find the mean Multiply the mean by the number of quadrats which will fit inside the area | | | | |
| Which part of this method is increasing the reliability? | Taking multiple samples and calculating an average | | | | |
| What may cause the population of a species to fall? | Increased competition for resources Increased predation Disease Pollution Habitat loss | | | | |
| Which resources may plants compete for? | WaterLightCarbon dioxideSpaceNutrients | | | | |
| Which resources may animals compete for? | FoodWaterShelter | | | | |
| Describe the shape of a population curve. | Increases slowly at first, then faster as time goes on. Reaches a maximum point. | | | | |
| Explain, giving reasons, the shape of the population curve below: | The graph starts slowly because there are not many organisms which are reproducing The graph gets steeper as more organisms reach maturity and can reproduce The graph levels off because of disease, competition or predation | | | | |
| What does the word 'conservation' mean? | Protecting the environment though management | | | | |

| What are some of the problems of deforestation? | Habitat loss and extinction of species Reduced soil fertility Flooding and landslides Changes to the atmosphere (less oxygen, more carbon dioxide, drier air) | | | | |
|---|--|--|--|--|--|
| What are some conservation activities which may be carried out? | Creation of new habitats – plants new trees, digging a garden pond Creation of nature reserves Captive breeding – such as in zoos | | | | |
| What does the word 'biodiversity' mean? | A range of living organisms | | | | |
| Why is biodiversity important? | Without biodiversity, it is more likely that the death of one species will result in the death of many more species | | | | |

| What does the word 'variation' mean? | Differences (between organisms) | | | | |
|--|---|--|--|--|--|
| What is discontinuous variation? | Differences which can be put into | | | | |
| | different groups easily (i.e. cannot be | | | | |
| | measured on a scale) | | | | |
| Give three examples of discontinuous | Blood type | | | | |
| variation. | Eye colour | | | | |
| | Whether you can roll your tongue | | | | |
| What is continuous variation? | Differences which can be measured on a | | | | |
| | scale and can take any value (between | | | | |
| | limits) | | | | |
| Give three examples of continuous | Height | | | | |
| variation. | Weight | | | | |
| | Head size | | | | |
| Why does variation exist? | Random mutations in DNA happen which | | | | |
| | can change the appearance of an | | | | |
| | organism | | | | |
| Why do you look similar to your parents? | When the sperm and eggs cells combine, | | | | |
| | 50% (23 chromosomes) of you DNA | | | | |
| | comes from your mum and 50% comes | | | | |
| | from your dad. | | | | |
| What is meant by the term 'species'? | Two organisms of the same species can | | | | |
| | reproduce to produce fertile offspring | | | | |
| | | | | | |
| | | | | | |
| What is 'natural selection'? | Survival of those organisms within a | | | | |
| | species which have favourable variations | | | | |
| | (e.g. sheep living in a cold country with | | | | |
| | thick wool) | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| | | | 1 1 | , | |
|--|---|------|---------|---------------|------|
| What are the five stages of evolution? | Variation exists within a species Environmental conditions change which some organisms are better adapted for Those with favourable variations survive and reproduce The favourable variations are passed on to their offspring This continues over millions of years until a new species emerges | | | | |
| How have polar bears evolved to survive in the arctic? | Thick fur for insulation White fur for camouflage Large paws to stop them sinking into the snow Large claws for hunting | | | | |
| How have cacti evolved to survive in the desert? | Small/no leaves to reduce water loss Very deep, long roots to absorb water Spikes for protection | | | | |
| How have camels evolved to survive in the desert? | Large humps for fat storage Yellow/brown fur for camouflage Large feed to stop them sinking into the sand Long eyelashes to keep sand out of their eyes | | | | |
| What evidence do we have for evolution? | Fossils | | | | |
| What are the 5 kingdoms of life? | Animals Plants Fungi Protists Bacteria | | | | |
| What are the key characteristics of animal cells? | Have a nucleusDo not have a cell wall | | | | |
| What are the key characteristics of plant cells? | Have a nucleusHave a cell wall made of celluloseContain chloroplasts | | | | |
| What are the key characteristics of fungal cells? | Have a nucleusHave a cell wall made of chitin | | | | |
| What are the key characteristics of protist cells? | Have a nucleusUnicellular | | | | |
| What are the key characteristics of bacterial cells? | Do not have a nucleusUnicellular | | | | |
| What is a vertebrate? What is an invertebrate? | An animal with a backbone An animal without a backbone | | | | |

| What are the key characteristics of a | Cold blooded | | | | |
|---|--|--|--|--|--|
| reptile? | Lays eggs with soft shells | | | | |
| | Has scales and dry skin | | | | |
| What are the key characteristics of an | Cold blooded | | | | |
| amphibian? | Lays eggs in water | | | | |
| | Doesn't have scale | | | | |
| What are the key characteristics of a | Warm blooded | | | | |
| bird? | Lays eggs with hard shells | | | | |
| | Has feathers | | | | |
| What are the key characteristics of a fish? | Cold blooded | | | | |
| | Lays eggs in water | | | | |
| | Has scales and wet skin | | | | |
| | | | | | |
| What are the key characteristics of a | Warm blooded | | | | |
| mammal? | Doesn't lay eggs | | | | |
| | Feeds its young milk | | | | |
| | Has fur/hair | | | | |
| What are the key characteristics of | Three main body parts | | | | |
| insects? | • 6 legs | | | | |
| | Usually 2 pairs of wings | | | | |
| What are the key characteristics of | Two main body parts | | | | |
| spiders? | • 8 legs | | | | |
| | No wings | | | | |

| What are the names of the 3 states of | Solid, liquid, gas | | | | | |
|--|---|----------|--|--|--|--|
| matter? | Sona, nquia, gus | | | | | |
| For which state of matter is this the | Liquid | | | | | |
| particle diagram? | | | | | | |
| | | | | | | |
| For which state of matter is this the | Gas | | | | | |
| particle diagram? | | | | | | |
| | | | | | | |
| For which state of matter is this the | Solid | | | | | |
| particle diagram? | | | | | | |
| How are the particles arranged in a solid? | Regular arrangement | | | | | |
| | Particles touching | | | | | |
| How do particles move in a solid? | Vibrate about a fixed point | | | | | |
| How are the particles arranged in a | Random arrangement | | | | | |
| liquid? | Particles touching | | | | | |
| How do particles move in a liquid? | Move around each other | | | | | |
| How are the particles arranged in a gas? | Random arrangementParticles far apart | | | | | |
| How do particles move in a gas? | Move freely | | | | | |
| Explain why gases can be compressed, | There is space between the particles, so | | | | | |
| but solids and liquids cannot. | they can be moved closer together. | | | | | |
| Explain why gases and liquids can flow, | The intermolecular forces in liquids and | | | | | |
| but solids cannot. | gases and weaker than in solids. This | | | | | |
| | means that particles are not fixed in | | | | | |
| | place. | | | | | |
| What are intermolecular forces? | Forces between molecules | | | | | |
| In which state of matter do the particles | Gas | | | | | |
| have most energy? | | | | | | |
| What causes gas pressure? | Collision of particles with the container wall | | | | | |
| What is the term used for the random | Brownian motion | | | | | |
| motion of particles? | | | | | | |
| What is the definition for diffusion? | The movement of particles from an area of higher concentration to an area of lower concentration. | | | | | |
| What type of change is a change of state? | Physical change | | | | | |
| Triat type of change is a change of state: | i ilyaicai change | <u> </u> | | | | |

| | T | | | | | |
|---|---|----------|--|---|--|--|
| What is the main difference between a | A chemical change results in new | | | | | |
| chemical change and a physical change? | substances being formed, whereas a | | | | | |
| | physical change does not | | | | | |
| What are all the changes of state called? | Melting, freezing, evaporating, boiling, | | | | | |
| | condensing and sublimating | | | | | |
| What happens to the arrangement, | The particles gain energy, which means | | | | | |
| movement and energy of particles during | they move faster. | | | | | |
| melting? | This allows them to overcome the | | | | | |
| | attractions between themselves enough | | | | | |
| | to be able to move away from each other | | | | | |
| | and out of their fixed positions. | | | | | |
| What happens to the arrangement, | The particles gain energy, which means | | | | | |
| movement and energy of particles during | they move faster. | | | | | |
| boiling/evaporation? | This allows them to overcome the | | | | | |
| | attractions between themselves enough | | | | | |
| | to be able to move away from each | | | | | |
| | other, which means they are no longer | | | | | |
| | touching. | | | | | |
| What state will a substance be if the | Gas | | | | | |
| temperature is above its boiling point? | | | | | | |
| What state will a substance be if the | Liquid | | | | | |
| temperature is between its melting point | | | | | | |
| and boiling point? | | | | | | |
| What state will a substance be if the | Solid | | | | | |
| temperature is below its melting point? | | | | | | |
| What is the melting point of water? | 0°C | | | | | |
| What is the boiling point of water? | 100°C | | | | | |
| What happens to water when it freezes? | It expands | | | | | |
| Why does water expand when it freezes? | The particles are further apart from each other | | | | | |
| What does this mean happens to the | It decreases (all other solids are denser | | | | | |
| density of water when it freezes? | than their liquid state) | | | | | |
| What are the stages involved in the water | Evaporation (from oceans and rivers) | | | | | |
| cycle? | Condensation (to form clouds) | | | | | |
| | Precipitation (as rain, snow etc.) | | | | | |
| | Run-off (water flows back to oceans | | | | | |
| | and seas) | | | | | |
| What can be done to increase the rate of | Better air flow (more wind) | | | | | |
| evaporation? | Warmer temperatures | | | | | |
| | Larger surface area (shallower) | | | | | |
| | container) | | | | | |
| How could the volume of water lost over | Measure the mass of water before | \vdash | | 1 | | |
| a number of days be accurately | the experiment. | | | | | |
| measured? | Measure the mass of water after the | | | | | |
| measureu: | experiment. | | | | | |
| | experiment. | | | | | |

| What is the definition of the word | The smallest particle of a chemical | | | | | \top |
|---|--|---|--------|--|--|---------|
| 'atom'? | element which can exist. | | | | | |
| What is the definition of the word | | | | | | |
| 'molecule'? | Two or more atoms chemically joined | | | | | |
| | together | | | | | - |
| What is definition of the word | Two or more atoms of different types | | | | | |
| 'compound'? | chemically joined together | | | | | _ |
| What is the definition of the word | Atoms of the same type | | | | | |
| 'element'? | | | | | | |
| What is the chemical symbol for | Н | | | | | |
| hydrogen? | _ | | | | | |
| What is the chemical symbol for oxygen? | 0 | | | | | |
| What is the chemical symbol for carbon? | С | | | | | _ |
| What is the chemical symbol for | N | | | | | |
| nitrogen? | | | | | | |
| What is the chemical symbol for sulfur? | S | | | | | |
| What is the chemical symbol for | Mg | | | | | |
| magnesium? | | | | | | \perp |
| What is the chemical symbol for sodium? | Na | | | | | |
| What is the chemical symbol for chlorine? | Cl | | | | | |
| What is the chemical symbol for calcium? | Ca | | | | | |
| What is the chemical symbol for copper? | Cu | | | | | |
| What is the chemical symbol for iron? | Fe | | | | | |
| What is the chemical symbol for helium? | He | | | | | |
| What is the formula of a molecule of | H ₂ O | | | | | |
| water? | | | | | | |
| What is the formula of a molecule of | CO ₂ | | | | | |
| carbon dioxide? | | | | | | |
| What is the formula of a molecule of | O ₂ | | | | | |
| oxygen? | | | | | | |
| What is the formula of a molecule of | CH₄ | | | | | |
| methane? | | | | | | |
| What is the formula of sodium chloride? | NaCl | | | | | |
| What is the formula of hydrochloric acid? | HCI | | | | | |
| What is the formula of sodium | NaOH | | | | | |
| hydroxide? | | | | | | |
| What is the formula of calcium | CaCO₃ | | | | | + |
| carbonate? | - 5 | | | | | |
| What is the formula of copper sulfate? | CuSO ₄ | | \Box | | | + |
| What is the formula of sulfuric acid? | H ₂ SO ₄ | | \Box | | | + |
| How are the chemical elements | In the periodic table | | + | | | + |
| organised? | | | | | | |
| Where are non-metals found in the | At the top-right | + | + | | | + |
| periodic table? | , and top right | | | | | |
| Will a compound have the same | No (e.g. iron sulphide is not magnetic | + | + | | | + |
| properties as the elements from which it | despite containing iron) | | | | | |
| is made? | despite containing nonj | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Chemistry – atoms, elements and compounds

| What are some properties of metals? | Malleable Good conductors of heat and electricity Lustrous (shiny) Sonorous (rings when hit) | | | | | |
|--|---|--|--|--|--|--|
| What are some properties of non-metals? | Brittle Poor conductors of heat and electricity Dull | | | | | |
| What is the composition of air? | 78% nitrogen 21% oxygen 1% other gases (including carbon dioxide) | | | | | |
| What does the ending -ate mean for a compound? | It contains oxygen | | | | | |

| What is the definition of a nure | A substance containing particles of only | | | | - | |
|---|--|----------|---|---|---|--|
| What is the definition of a pure substance? | A substance containing particles of only | | | | | |
| What is the definition of a mixture? | One type A substance containing particles of more | \vdash | | | | |
| what is the definition of a mixture? | | ! | | | | |
| | than one type, not bonded together | | | | | |
| How can a pure substance be identified? | A pure substance melts and boils at a | | | | | |
| | particularly temperature. A mixture melts | | | | | |
| | and boils across a range of temperatures. | | | | | |
| What happens to the volume of most | They expand | ! | | | | |
| solids, liquids and gases when they are | | ! | | | | |
| heated (with the exception of water)? | | | | | | |
| How does a thermometer work? | The mercury or alcohol inside expands | | | | | |
| | when it gets hot. This forces it up the | | | | | |
| | capillary tube where the temperature can | | | | | |
| | be read-off. | | | | | |
| What is the difference between | Evaporation can happen at any | ! | | | | |
| evaporation and boiling? | temperature. | | | | | |
| | Boiling occurs at a specific temperature | ! | | | | |
| | for a particular substance. | | | | | |
| What is the law of conservation of mass? | Mass cannot be gained or lost because | | | | | |
| | atoms cannot be made or destroyed | | | | | |
| What is a solvent? | A liquid into which a substance can be | | | | | |
| | dissolved | | | | | |
| What is a solute? | A solid or a gas which has been dissolved | | | | | |
| What is a solution? | A mixture of a solvent and a solute | | | | | |
| What are three ways to increase the rate | Increase the temperature | | | | | |
| at which a substance will dissolve? | Stir the solvent | | | | | |
| | Increase the surface area of the | | | | | |
| | solute (grind it up!) | | | | | |
| What is the term used to describe a | Dilute | | | | | |
| solution with only a small amount of | | | | | | |
| solute dissolved? | | | | | | |
| What is the term used to describe a | Concentrated | | | | | |
| solution with a large amount of solute | | | | | | |
| dissolved? | | | | | | |
| What do we call a solution into which no | Saturated | | | | | |
| more solute can be dissolved? | | | | | | |
| NA/le at in the coefficient of increasing the | H. Sarana and | | | | | |
| What is the effect of increasing the | It increases | | | | | |
| temperature upon the mass of solute | | | | | | |
| which can dissolve in a solvent? | | | - | | | |
| What do we call a substance which | Insoluble | | | | | |
| cannot be dissolved in a solvent? | | | | | | |
| What do we call a mixture of a solvent | A suspension | | | | | |
| and an insoluble substance? | | | | | | |
| What are the two methods of separating | Decanting | | | | | |
| an insoluble solid from a liquid? | Filtration | | | | | |
| What is decanting? | Allowing solid particles to sink to the | | | | | |
| | bottom of a container (sedimentation) | | | | | |
| | and then carefully pouring off the liquid | | | 1 | | |

| What is filtration? | Passing a suspension through a very fine | | | | | | | 1 |
|--|---|--|----------|----------|----------|----------|---|----|
| | sieve (normally made of paper). | | | | | | | |
| How does filtration work? | Small, liquid particles, are able to pass | | | | | | | |
| | through the pores in the filter paper. | | | | | | | |
| | Larger, solid particles, get trapped and | | | | | | | |
| | cannot pass through. | | | | | | | |
| What is the same for the solid that is | Residue | | | | | | | |
| trapped by the filter paper? | | | | | | | | |
| What is the name for the liquid which | Filtrate | | | | | | | |
| passes through the filter paper? | | | | | | | | |
| What type of mixtures can be separated | Mixtures of substances with different | | | | | | | |
| using distillation? | boiling points. Evaporation and | | | | | | | |
| | condensation only happen once. | | | | | | | |
| What type of mixtures can be separated | A mixture of different coloured | | | | | | | |
| using paper chromatography? | compounds dissolved in a liquid. These | | | | | | | |
| | substances must have different levels of | | | | | | | |
| | solubility. | | | | | | | |
| | , | | | | | | | |
| How is paper chromatography carried | 1. A line is drawn in pencil towards the | | | | | | | |
| out? | bottom of the chromatography paper | | | | | | | |
| | 2. A small spot of the mixture is placed | | | | | | | |
| | on the line | | | | | | | |
| | 3. The bottom of the chromatography | | | | | | | |
| | paper is placed in a solvent (usually | | | | | | | |
| | water) and the water allowed to | | | | | | | |
| | move up the paper | | | | | | | +- |
| Why is the line drawn in pencil? | Graphite doesn't dissolve in water and so | | | | | | | |
| the little describes and selections due | won't move up the paper | | | | | | | +- |
| How high does the water level need to | Between the bottom of the paper and the | | | | | | | |
| be? | pencil line | | _ | | | + | | + |
| What does it mean if a spot doesn't move | The substance doesn't dissolve in that | | | | | | | |
| from the pencil line? | solvent The first have a seed as seed the seed of | | _ | | | + | | + |
| What does the distance moved by a spot | The further a spot moves, the more | | | | | | | |
| tell you about the solubility of the substance? | soluble it is | | | | | | | |
| | A pure substance will only have one snot | | - | | | + | | _ |
| How can you tell the difference between | A pure substance will only have one spot. An impure substance will separate into | | | | | | | |
| pure and impure substances on a paper | | | | | | | | |
| chromatogram? | multiple spots | | | | | | | + |
| How can you tell if two substances from different mixtures are the same? | They will have travelled the same distance | | | | | | | |
| | | | \dashv | \dashv | \dashv | \dashv | - | + |
| Which alternative solvents can be used in | Ethanol or propanone | | | | | | | |
| paper chromatography? | Water that is safe to driple | | \dashv | | + | \dashv | | + |
| What is potable water? | Water that is safe to drink | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| How can waste and ground water be made potable? | Sedimentation (allowing large, insoluble substances to sink to the bottom) Filtration (removes smaller pieces of insoluble material) Chlorination (adding chlorine to kill micro-organisms including bacteria) | | | | |
|---|--|--|--|--|--|
| How can sea water be made potable? | By using distillation (evaporation followed by condensation) | | | | |
| Why is distilled water more suitable than tap water for chemical analysis? | Distilled water doesn't contain any dissolved salts which may interfere with the results of chemical analysis | | | | |
| What is suck-back? | When cold water is sucked back through the gas exchange tube after heating has finished | | | | |
| Why is suck-back dangerous? | When cold liquids come into contact with hot glassware, it can cause it to shatter | | | | |
| How can suck-back be prevented? | Remove the gas-exchange tube from the liquid before turning off the Bunsen burner | | | | |
| Which piece of equipment will condense a solvent more effectively than a beaker of ice water? | A Liebig condenser | | | | |
| Why should a salt solution not be completely dried by being heated? | The hot salt/solvent may spit out and burn you The heat from the Bunsen flame may cause the salt to break down (decompose) | | | | |

| What is the law of conservation of mass | The mass of the reactants is the same as | | | П | 1 | | _ |
|--|--|---|--|---|---|----------|---|
| | | | | | | | |
| when applied to chemical reactions? | the mass of products formed | | | _ | | | - |
| What is a chemical reaction? | The rearrangement of atoms to form new | | | | | | |
| | substances. This involves the breaking | | | | | | |
| | and forming of chemical bonds. | | | | | | _ |
| Suggest some examples of chemical | Ripening fruit | | | | | | |
| reactions in everyday life. | Setting superglue | | | | | | |
| | Cooking food | | | _ | | | _ |
| What is a combustion reaction? | The burning of a substance in oxygen to | | | | | | |
| | release energy | | | | | | |
| Which piece of scientific equipment is | A Bunsen burner | | | | | | |
| used for heating things strongly in a lab? | | | | | | | |
| Suggest some safety precautions to take | Long hair tied back | | | | | | |
| when using a Bunsen burner. | Goggles on | | | | | | |
| | Use tongs for handling hot objects | | | | | | |
| What type of flame is used for heating | A roaring blue flame | | | | | | |
| things strongly? | | | | | | | |
| What type of flame is used for gentle | A safety flame | | | | | | |
| heating, or when the Bunsen burner is | | | | | | | |
| not being used? | | | | | | | |
| How is a safety flame set using a Bunsen | The air hole is closed | | | | | | |
| burner? | | | | | | | |
| Which part of the roaring blue flame is | The tip of the light blue inner cone | | | | | | |
| the hottest? | | | | | | | |
| Which 3 things are required for | Heat, a fuel and oxygen | | | | | | |
| combustion? | | | | | | | |
| What is the chemical test for oxygen? | A flowing splint relights | | | | | | |
| What is the chemical test for carbon | Limewater turns from colourless to | | | | | | |
| dioxide? | cloudy-white when carbon dioxide is | | | | | | |
| | bubbled through it | | | | | | |
| What is the chemical test for water? | Anhydrous copper sulfate turns from | | | | | | |
| | white to blue | | | | | | |
| What is a hydrocarbon? | A compound containing only hydrogen | | | | | | |
| , | and carbon atoms | | | | | | |
| What are the products of the complete | Carbon dioxide and water | | | | | | _ |
| combustion of a hydrocarbon? | | | | | | | |
| What is the word equation for the | Hydrocarbon + oxygen → carbon dioxide | | | 1 | + | | + |
| complete combustion of a hydrocarbon? | + water | | | | | | |
| Describe how this equipment can be used | Gases are collected by the funnel and | | | | + | \dashv | + |
| to determine the products of | passed through the gas-exchange tube. | | | | | | |
| to actomine the products of | The ice water condenses the water | | | | | | |
| | vapour. | | | | | | |
| | The lime water turns cloudy due to the | | | | | | |
| Funnel | carbon dioxide. | | | | | | |
| | carbon dioxide. | | | | | | |
| | | | | | | | |
| Lime Water | | | | | | | |
| Ice Water Spirit Burner | | | | | | | |
| combustion. | | | | | | | |
| | 1 | 1 | | | | | 1 |

| What is formed during the incomplete | Carbon monoxide and soot (solid carbon | | | | | | | |
|--|--|----------|---|---------|-------------------------|---|---|---|
| combustion of a hydrocarbon? | particles) | | | | | | | |
| What is the problem with carbon | It binds to your red blood cells preventing | | | | + | | | |
| monoxide? | them from carrying oxygen around the | | | | | | | |
| monoxide: | body. This can lead to death. | | | | | | | |
| What is the problem with soot? | It makes buildings dirty and can cause | | | | | | | |
| What is the problem with soot: | problems for people with asthma (by | | | | | | | |
| | irritating the trachea) | | | | | | | |
| Which human activities release carbon | - | | | | | | | |
| dioxide? | Any involving burning fossil fuels (driving | | | | | | | |
| | petrol/diesel cars, making electricity etc.) | | | | | | | |
| What is the impact of carbon dioxide on | Carbon dioxide is a greenhouse gas and | | | | | | | |
| the climate? | causes heat to be trapped inside the | | | | | | | |
| | Earth's atmosphere | | | | | | | |
| How does the greenhouse effect work? | Light from the sun enters the | | | | | | | |
| | atmosphere and hits the Earth. | | | | | | | |
| | The Earth absorbs and reemits some | | | | | | | |
| | of this energy back into space. | | | | | | | |
| | Greenhouse gases absorb infrared district (boot) and good in the selection. | | | | | | | |
| | radiation (heat) and reemit it back to | | | | | | | |
| How is sulfur disvide produced? | Earth Sulfur impurities in goal react with | | | | | | | |
| How is sulfur dioxide produced? | Sulfur impurities in coal react with | | | | | | | |
| What is the graph and with sulfing district | oxygen creating sulfur dioxide Sulfur dioxide dissolves in clouds to | | | | | | | |
| What is the problem with sulfur dioxide | | | | | | | | |
| in the atmosphere? | create acid rain | | | | | | | |
| What is the problem with acid rain? | It corrodes buildings/statues | | | | | | | |
| what is the problem with acid rain: | It kills fish and other aquatic | | | | | | | |
| | organisms | | | | | | | |
| How can the production of sulfur dioxide | Burn fewer fossil fuels | | | | | | | |
| and carbon dioxide be reduced? | Produce electricity using renewable | | | | | | | |
| and carbon dioxide be reduced: | methods | | | | | | | |
| | Drive electric cars (or walk/cycle) | | | | | | | |
| What is a thermal decomposition | The breaking down of a substance using | | | | | | | |
| reaction? | heat | | | | | | | |
| What are the products of the thermal | Dehydrated copper sulfate and water | | | | + | | | |
| decomposition of hydrated copper | 2 stry at a copper samute and water | | | | | | | |
| sulfate? | | | | | | | | |
| What are the products of the thermal | A metal oxide and carbon dioxide | \vdash | | | + | | - | |
| decomposition of a metal carbonate? | A metal oxide and carbon dioxide | | | | | | | |
| - | Copper carbonate → copper oxide + | H | | - | + | - | | |
| What is the word equation for the | carbon dioxide | | | | | | | |
| thermal decomposition of copper | carbon dioxide | | | | | | | |
| carbonate? | A magazina invalidas tipo sil 1995 conf | \vdash | _ | + | | | | - |
| What is an oxidation reaction? | A reaction involving the addition of | | | | | | | |
| Miles I de collecte con / de la collecte con / de l | oxygen to a substance | \vdash | | | + | | | |
| What does the term 'reduction' mean? | The removal of oxygen from a substance | \sqcup | _ | \perp | $\downarrow \downarrow$ | | _ | - |
| What is the word equation for the | Metal + oxygen → metal oxide | | | | | | | |
| reaction between a metal and oxygen? | | | | | | | | |

| 144 | | | | | | |
|---|---|--|---------|---|----------|---------|
| What is the word equation for the | Metal + water → metal hydroxide + | | | | | |
| reaction between a reactive metal and | hydrogen | | | | | |
| water? | Martin and Naulton Indiana | | | | | - |
| What is the word equation for the | Metal + acid → salt + hydrogen | | | | | |
| reaction between a metal and an acid? | | | | | | - |
| What type of salt is created when | A metal <u>chloride</u> | | | | | |
| hydrochloric acid is used? | | | | | | |
| What type of salt is created when sulfuric | A metal <u>sulfate</u> | | | | | |
| acid is used? | | | | | | |
| What type of salt is created when nitric | A metal <u>nitrate</u> | | | | | |
| acid is used? | | | | | <u> </u> | |
| What is the chemical test for hydrogen? | A lit splint makes a squeaky pop | | | | | |
| What is the corrosion of a metal? | The slow reaction of a metal with oxygen | | | | | |
| What is the name for the corrosion of | Rusting | | | | | |
| iron and steel? | | | | | | |
| What is required for rusting? | Iron, oxygen and water | | | | | |
| What is the chemical name for rust? | Hydrated iron oxide | | | | | |
| Under what conditions will iron rust most | When it is placed in salt water or dilute | | | | | |
| quickly? | acid | | | | | |
| How could this equipment be used to | The iron wool will react with the oxygen | | | | | |
| determine the percentage of oxygen in | in the air. This will cause the water in the | | | | | |
| air? | test tube to rise. The percentage increase | | | | | |
| Iron wool | in height will be the same as the | | | | | |
| Test-tube | percentage of oxygen in air (approx. 20%) | | | | | |
| | | | | | | |
| Beaker Beaker | | | | | | |
| | | | | | | |
| / Water | | | | | | |
| | | | | | | _ |
| How can rusting be prevented? | Barrier methods (such as painting or | | | | | |
| | using oil) | | | | | |
| | Sacrificial methods (attaching a metal | | | | | |
| | which is more reactive and therefore | | | | | |
| What is only a pising? | oxidises more easily than iron does) | | | | | - |
| What is galvanising? | Coating iron or steel in a thin layer of | | | | | |
| | zinc. This involves both a barrier and a | | | | | |
| William to the decree of the control of the decree of | sacrificial method | | - | | | |
| What is the term used for metals found | Ores | | | | | |
| combined with other substances? | | | | | | |
| What is the term used for metal found | Native metals | | | | | |
| uncombined in the ground? | | | \perp | | | |
| Which metals are likely to be found in | Unreactive metals (gold, silver, platinum) | | | | | |
| their native state? | | | \perp | 1 | | \perp |
| How are the most reactive metals | Electrolysis – using electricity to split the | | | | | |
| extracted from their ores? | compound | | | | | |
| How are metals which are less reactive | Heating with carbon – causing a | | | | | |
| than carbon extracted from their ores? | displacement reaction | | | | <u> </u> | |
| How are the least reactive metals | Roasting – heating in air | | | | | |
| extracted from their ores? | | | | | | |

| What does this symbol represent and what general precautions would you take when using a chemical that displayed this symbol? | Flammable; keep away from flames (and sources of heat) | | | | |
|---|---|--|--|--|---|
| What does this symbol represent and what general precautions would you take when using a chemical that displayed this symbol? | Corrosive; wear gloves and safety glasses (wash away spills with lots of water) | | | | |
| What does this symbol represent and what general precautions would you take when using a chemical that displayed this symbol? | Generally harmful or irritant to skin/eyes/respiratory system; keep away from skin and eyes | | | | |
| What does this symbol represent and what general precautions would you take when using a chemical that displayed this symbol? | Toxic; do not swallow, or breathe in, the material or allow it to come into contact with skin | | | | |
| What does this symbol represent and what general precautions would you take when using a chemical that displayed this symbol? | Can cause harm to life in the environment; avoid release to the environment e.g. don't put down the sink | | | | |
| What is an acid? | A substance which reacts with a base to produce a salt and water | | | | |
| What is an alkali? | A base which will dissolve in water | | | | + |
| Which particle do all acids contain? | Hydrogen ions (charged hydrogen atoms) | | | | |
| Give some examples of every-day acids. | Lemon juice (citric acid) Vinegar (ethanoic acid) Stomach acid (hydrochloric acid) Tea (tannic acid) | | | | |
| Give some examples of every-day alkalis. | SoapOven cleanerToothpaste | | | | |

| | | | | | | - | | | |
|--|---|--------|---|---|--|---|----------|---|--|
| Which scale is used to measure the | pH scale | | | | | | | | |
| strength of acids and alkalis? | | | | | | | | | |
| With universal indicator, what colour will | Red; 1-2 | | | | | | | | |
| a strong acid turn? What pH does this | | | | | | | | | |
| represent? | | | | | | | | | |
| With universal indicator, what colour will | Yellow; 5-6 | | | | | | | | |
| a weak acid turn? What pH does this | | | | | | | | | |
| represent? | | | | | | | | | |
| With universal indicator, what colour will | Green; 7 | | | | | | | | |
| a neutral substance turn? What pH does | | | | | | | | | |
| this represent? | | | | | | | | | |
| With universal indicator, what colour will | Blue/green; 8-9 | | | | | | | | |
| a weak alkali turn? What pH does this | | | | | | | | | |
| represent? | | | | | | | | | |
| With universal indicator, what colour will | Purple; 13-14 | | | | | | | | |
| a strong alkali turn? What pH does this | | | | | | | | | |
| represent? | | | | | | | | | |
| What colour will litmus paper turn with | Red | | | | | | | | |
| an acid? | | | | | | | | | |
| What colour will litmus paper turn with | Blue | | | | | | | | |
| an alkali? | | | | | | | | | |
| How could you prepare an indicator using | Grind up the plant in water | | | | | | | | |
| red cabbage, raw beetroot or | Filter the liquid | | | | | | | | |
| blackcurrants? | Add to acid/alkali | | | | | | | | |
| What is a better method for measuring | Using a pH probe | | | | | | | | |
| pH, rather than using an indicator? | | | | | | | | | |
| What is the general word equation for | Acid + base → salt + water | | | | | | | | |
| the reaction between an acid and a base? | | | | | | | | | |
| What is the general word equation for | Acid + metal → salt + hydrogen | | | | | | | | |
| the reaction between an acid and a | , , | | | | | | | | |
| metal? | | | | | | | | | |
| What is the general word equation for | Acid + metal oxide → salt and water | | | | | | | | |
| the reaction between an acid and a metal | | | | | | | | | |
| oxide? | | | | | | | | | |
| What is the general word equation for | Acid + metal hydroxide → salt + water | | | | | | | | |
| the reaction between an acid and a metal | , | | | | | | | | |
| hydroxide? | | | | | | | | | |
| What is the general word equation for | Acid + metal carbonate → salt + water + | | | | | | | | |
| the reaction between an acid and a metal | carbon dioxide | | | | | | | | |
| carbonate? | | | | | | | | | |
| What is the name for the type of reaction | Neutralisation reaction | + | + | + | | | | 1 | |
| between an acid and a base which forms | Treat and an reaction | | | | | | | | |
| a salt and water | | | | | | | | | |
| What is the method for making a pure | React an acid with excess base | + | + | + | | | \vdash | | |
| salt from an acid and an insoluble base? | 2. Filter the excess base | | | | | | | | |
| sale from an acid and an insoluble base: | 3. Evaporate the water | | | | | | | | |
| What is the effect of evaporating the | Larger crystals | \top | | 7 | | | | | |
| water more slowly? | , | | | | | | | | |
| · · · · · · · · · · · · · · · | | | | | | | | | |

| What is the definition of a 'renewable' | One which can be replenished within a | | | | |
|--|---|---|--|---|--|
| energy resource? | lifetime | | | | |
| What are the four examples of non- | Coal | | | | |
| renewable energy resources? | • Oil | | | | |
| S, | • Gas | | | | |
| | Nuclear | | | | |
| What are some examples of renewable | Biofuel (biomass) | | | | |
| energy resources? | Solar | | | | |
| | Wind | | | | |
| | Wave | | | | |
| | Tidal | | | | |
| | Geothermal | | | | |
| | Hydroelectric | | | | |
| Suggest three advantages of renewable | No greenhouse gas emissions | | | | |
| energy resources. | They won't run out | | | | |
| | Cheap to run | | | | |
| Suggest three disadvantages of | Can't be used all the time (it's not | | | | |
| renewable energy resources. | always sunny!) | | | | |
| | Expensive to set up | | | | |
| | Only available in certain locations | | | | |
| Suggest two advantages of non- | High energy density (lots of energy | | | | |
| renewable energy resources. | for a small mass of fuel) | | | | |
| Suggest two disadvantages of non- | Can be used at any time Rurning facilities amits grouphouse. | - | | | |
| renewable energy resources. | Burning fossil fuels emits greenhouse gases | | | | |
| renewable energy resources. | Fossil fuels will run out and are | | | | |
| | expensive | | | | |
| What are fossil fuels? | Fuels that we dig up (or extract) from the | | | | |
| | Earth's crust. | | | | |
| How are fossil fuels made? | They are formed from dead plants and | | | | |
| | animals which have been exposed to heat | | | | |
| | and pressure over millions of years. The | | | | |
| | pressure comes from layers building up | | | | |
| | on top of the dead organisms. | | | | |
| How are fossil fuels used to generate | They are burned and the heat used to | | | | |
| electricity? | boil water. The steam then turns turbines | | | | |
| | to generate electricity. | | | | |
| What are nuclear fuels? | Elements which can undergo nuclear | | | | |
| | reactions to release large amounts of | | | | |
| | energy | | | | |
| What are bio-fuels? | Fuels made from animal waste or plants | | | | |
| How can the wind be used as a source of | Wind turbines can be used to generate | | | | |
| energy? | electricity | | | ⊥ | |
| What is hydro-electricity? | Electricity generated by water falling | | | | |
| | through a dam (turning turbines) | | | | |
| How can the tides be used as a source of | When the tides goes in or out, it can turn | | | | |
| energy? | turbines in a river or estuary | | | | |

| How can the sun be used as a source of | Solar cells can use energy transferred by | | | | |
|---|---|--|--|--|--|
| energy? | radiation from the sun to generate | | | | |
| | electricity | | | | |
| What is geothermal energy? | Energy generated through steam turning | | | | |
| | turbines. The steam is generated using | | | | |
| | hot rocks under the ground. | | | | |
| What is the ultimate source of most of | The sun | | | | |
| Earth's energy? | | | | | |
| How does the sun provide the energy for | Water evaporates and is then | | | | |
| hydroelectricity? | precipitated into rivers/lakes | | | | |
| How does the sun provide energy for | Temperature differences cause a flow of | | | | |
| wave power? | air (wind). When the wind blows across | | | | |
| | water it makes waves. | | | | |
| How does the sun provide energy for | Plants take in light for photosynthesis and | | | | |
| fossil fuels? | use it to grow. | | | | |

| What is energy? | A measure of the work which has been | | | | |
|---|--|--|--|--|--|
| | done or work which is able to be done. | | | | |
| What is the unit for energy? | Joules | | | | |
| What are the 7 energy stores? Give an example of each. | Chemical (e.g. a battery, food, matches etc.) Thermal (e.g. a fire, a radiator) Kinetic (e.g. a car moving) Elastic (strain) (e.g. a rubber band) Gravitational (e.g. climbing a ladder) Magnetic (e.g. magnets attracting/repelling) Nuclear (e.g. the sun, radio-active fuel in a power station) | | | | |
| What are the 4 energy transfer pathways? | Electrically (charges moving through a circuit) By radiation (light or sound) Mechanically (a force moving through a distance) By heating (due to a difference in temperature) | | | | |
| What are the energy transfers taking place when a battery-powered torch is turned on? | Chemical → thermal (electrically and by light) | | | | |
| What are the energy transfers taking place when Bunsen burner is used to heat water? | Chemical → thermal (by heating) | | | | |
| What are the energy transfers taking place when a roller coaster goes down a hill? | Gravitational → kinetic (mechanically) | | | | |

| What are the energy transfers taking place when a person rubs their hands together? | Kinetic → thermal (mechanically) | | | | |
|---|--|--|--|--|--|
| What is the law of conservation of energy? | Total energy at the start = Total energy at the end Energy cannot be made or destroyed, but it can be transferred from one store to another. | | | | |
| What do we mean when we say that energy is dissipated? | The energy has become stored in less useful ways (e.g. the surrounding may heat up) | | | | |
| What is meant by the term 'efficiency'? | The proportion of energy which is transferred to 'useful' energy stores. | | | | |
| How can efficiency be calculated? | $ Efficiency = \frac{useful\ energy\ transferred}{total\ energy\ supplied} $ This can be multiplied by 100 to give a percentage | | | | |
| How can unwanted energy transfers be reduced? | Using lubrication in moving systems Using insulation where thermal energy is needed | | | | |
| What is temperature? | A measure of the average kinetic energy of the particles in a substance | | | | |
| What are the units of temperature? | Degrees Celsius (°C)Degrees Kelvin (K) | | | | |
| Convert 0 K to °C | -273°C | | | | |
| What is another name for 0 K? | Absolute zero | | | | |
| Why can the temperature of a substance not go below absolute zero? | At absolute zero, the particles have no kinetic energy. | | | | |
| What is the name for a substance which allows heat to be transferred easily? | A conductor of heat | | | | |
| How does conduction transfer heat? | The particles vibrate and collide with each other, transferring the energy | | | | |
| In which direction is heat transferred? | From hotter objects to colder objects | | | | |

| What is a force? | Something which changes the speed, | Π | | | | | | T | |
|---|--|----------|---|----------|---|---|---|---|---|
| what is a force. | direction or shape of an object | | | | | | | | |
| What are the units for force? | Newtons (N) | H | | | | | | + | |
| Which piece of equipment could be used | Force meter (Newton meter) | | | 1 | | | | | |
| to measure a force? | Torse meter (newsmineter) | | | | | | | | |
| How do we represent forces in diagrams? | Using arrows (showing the size and | | | | | | | | |
| · | direction of the force) | | | | | | | | |
| What do we call the sum (or total) of all | The resultant force | | | | | | | | |
| of the forces acting on an object? | | | | | | | | | |
| What is a contact force? | A force which requires objects to be | | | | | | | | |
| | touching for the force to act | | | | | | | | |
| Give 4 examples of contact forces. | Normal contact force | | | | | | | | |
| • | Tension | | | | | | | | |
| | Friction (including air/water | | | | | | | | |
| | resistance) | | | | | | | | |
| | Upthrust | | | | | | | | |
| | Lift | | | | | | | | |
| What is a non-contact force? | A force which does not require objects to | | | | | | | | |
| | be touching to act. | | | | | | | | |
| Give 3 examples of non-contact forces. | Gravitational force | | | | | | | | |
| | Magnetic force | | | | | | | | |
| | Electrostatic force (force between | | | | | | | | |
| | charged particles) | | | | | | | | |
| What is the equation which links speed, | $Speed = \frac{distance}{time}$ | | | | | | | | |
| distance and time? | | | | | | | | | |
| Which piece of scientific equipment may | Ruler, tape measure etc. | | | | | | | | |
| be used to measure distance? | | \sqcup | | - | | | | | |
| Which piece of scientific equipment may | Stop clock | | | | | | | | |
| be used to measure time? | | \sqcup | | - | | | | | |
| What are the units used for speed? | Metres per second (m/s) | \sqcup | | - | | | | | |
| What are the units used for distance? | Metres | Ш | | - | | | | | |
| What are the units used for time? | Seconds | | | | | | | | |
| How can minutes be converted to | Multiply by 60 | | | | | | | | |
| seconds? | 144 H: 1 1 CO : : / H: 1 1 COO) | Ш | | - | | | | | |
| How can hours be converted to seconds? | Multiply by 60 twice (or multiply by 3600) | Ш | | - | | | | | |
| How can kilometres be converted to | Multiply by 1000 | | | | | | | | |
| metres? | - | | | | | | | | |
| What is 'relative motion'? | The speed of a moving object compared | | | | | | | | |
| Handa maladina anno destre la 14 | to another moving object | \vdash | + | \dashv | _ | - | 4 | | + |
| How is relative speed calculated for | Fastest speed – slowest speed | | | | | | | | |
| objects moving in the same direction? | Consider this expansion of the control of the contr | \vdash | + | - | | - | _ | | + |
| How is relative speed calculated for | Speed of object A + speed of object B | | | | | | | | |
| objects moving in opposite directions? | Moving forward at a constant and and | \vdash | + | + | - | - | 4 | _ | + |
| On a distance-time graph, what is | Moving forward at a constant speed | | | | | | | | |
| represented by a straight line moving up? | Maning hadroned at a sand of the sand | \vdash | + | + | - | - | 4 | _ | + |
| On a distance-time graph, what is | Moving backwards at a constant speed | | | | | | | | |
| represented by a straight line moving | | | | | | | | | |
| down? | | | | | | | | | |

Physics – describing motion

| On a distance-time graph, what is | A stationary object | | | | |
|--|---|--|--|--|--|
| represented by a flat line? | | | | | |
| How can the speed of an object be | By calculating the gradient (steepness of | | | | |
| calculated using a distance-time graph? | the lines) – | | | | |
| | change in distance | | | | |
| | change in time | | | | |
| On a distance-time graph, what does a | Moving quickly | | | | |
| steep line represent? | | | | | |
| On a distance-time graph, what does a | Moving slowly | | | | |
| shallow line represent? | | | | | |
| In which direction does gravity act? | Towards the centre of mass (e.g. the | | | | |
| | centre of the Earth) | | | | |
| Which two factors do the strength of | The mass of both objects | | | | |
| gravity depend upon? | The distance between the objects | | | | |
| If the mass of the object increases, what | It increases | | | | |
| happens to the size of gravity? | | | | | |
| If the distance between the objects | It decreases | | | | |
| increase, what happens to the size of | | | | | |
| gravity? | | | | | |
| What is the meaning of the word 'mass'? | The amount of matter (stuff) that an | | | | |
| | object is made up of | | | | |
| What is the meaning of the word | A force caused by gravity acting upon a | | | | |
| 'weight'? | mass | | | | |
| What is the equation which links weight, | $Weight = mass \times gravitational field strength$ | | | | |
| mass and gravitational field strength? | | | | | |
| What are the units for mass? | Kilograms (kg) | | | | |
| What are the units for weight? | Newtons (N) | | | | |
| What are the units for gravitational field | Newtons per kilogram (N/kg) | | | | |
| strength? | | | | | |

| | 1 | | | | | | | |
|--|--|---|------|-----------|---|--------|--------|----------|
| If forces are balanced, what is the size of | Zero | | | | | | | |
| the resultant force? | | | | | | | | <u> </u> |
| If no resultant force acts upon an object, | It will remain at a constant speed, in a | | | | | | | |
| what will happen to its motion? | constant direction (or will be stationary) | | | | | | | ╄ |
| If two forces are acting in the same | Add the forces together | | | | | | | |
| direction, how can the resultant force be | | | | | | | | |
| calculated? | | | | | | | | |
| If two forces are acting in opposite | Take the smaller force away from the | | | | | | | |
| directs, how can the resultant force be | larger force | | | | | | | |
| calculated? | | | | | | | | <u> </u> |
| What is Hooke's law? | The amount of stretch for a spring is | | | | | | | |
| | directly proportional to the mass added. | | | | | | | |
| Which equation links: force, extension | $Force = spring \ constant \times extension$ | | | | | | | |
| and spring constant | | | | | | | | |
| If the force applied to a spring is doubled, | It will double | | | | | | | |
| what will happen to the extension of the | | | | | | | | |
| spring? | | | | | | | | |
| What is the term used for when a spring | Limit of proportionality (or the elastic | | | | | | | |
| will no longer return to its original form? | limit) | | | | | | | |
| What is the term used for this | Series | | | | | | | |
| arrangement of springs? | | | | | | | | |
| <u>uinqinu</u> | | | | | | | | |
| 30 _K | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 0000 K | | | | | | | | |
| | | | | | | | | |
| m m | | | | | | | | _ |
| What is the effect on the total extension | The extension will double | | | | | | | |
| of the springs, of adding an identical | | | | | | | | |
| spring in series? | | | | | | | | - |
| What is the term used for this | Parallel | | | | | | | |
| arrangement of springs? | | | | | | | | |
| | | | | | | | | |
| 3, 3, | | | | | | | | |
| 3, 3, | | | | | | | | |
| 7 7 | | | | | | | | |
| | | | | | | | | |
| m | | | | | | | | |
| What is the effect on the total extension | The extension will half | | | | T | | | |
| of the springs, of adding an identical | | | | | | | | |
| spring in parallel? | | | | | | | | |
| Which force opposes the forward motion | Friction (including air resistance and | | | 1 | | | 1 | 1 |
| of an object? | water resistance) | | | | | | | |
| What causes air and water resistance? | The collision of gas (or water) molecules | | + | \dagger | | | 1 | 1 |
| | hitting an object. This exerts a force, | | | | | | | |
| | slowing the object down | | | | | | | |
| Which energy transfer happens as a | Kinetic → thermal | 1 | | | | \top | \top | 1 |
| result of friction? | - | | | | | | | |
| | 1 | | | | | | | — |

| What is meant by the term 'stopping | The distance required to stop a vehicle at | | | | | |
|--|--|--|---|--|---------|---|
| distance'? | different speeds | | | | | |
| What is meant by the term 'thinking | The distance travelled between seeing a | | | | | |
| distance'? | danger and applying the brake | | | | | |
| What is meant by the term 'braking | The distance travelled between applying | | | | | |
| distance'? | the brake and stopping | | | | | |
| How is stopping distance calculated? | Stopping distance = thinking distance + | | | | | |
| | braking distance | | | | | |
| Which factors may affect the thinking | Speed of the vehicle | | | | | |
| distance? | Visibility | | | | | |
| | Whether the driver has taken any | | | | | |
| | drugs (alcohol, caffeine etc.) | | | | | |
| | Tiredness | | | | | |
| What factors may affect the braking | Speed of the vehicle | | | | | |
| distance? | Type of road surface | | | | | |
| | Condition of brakes | | | | | |
| | Mass of the vehicle | | | | | |
| | Weather conditions | | | | | |
| How can friction be reduced? | Smooth the surfaces | | | | | |
| | Use a lubricant | | | | | |
| | Moving more slowly | | | | | |
| What is the equation which links: | $Pressure = \frac{force}{}$ | | | | | |
| pressure, force and area? | area | | | | | |
| What are the units for area? | Metres squared (m²) or centimetres | | | | | |
| | squared (cm²) | | | | | |
| What are the units for pressure? | Newtons per metre squared (N/m²) or | | | | | |
| | newtons per centimetre squared (N/cm²) | | | | | |
| Why does a person wearing skis not sink | The area of the skis is higher and | | | | | |
| into the snow, whereas a person wearing | therefore the pressure is lower. | | | | | |
| shoes would sink into the snow? | | | | | | |
| | | | | | | |
| | | | _ | | \perp | 4 |
| Why does a drawing pin (see picture) go | The area of the pointed bit is small, and | | | | | |
| into the wall, but not hurt your thumb? | therefore the pressure is high. | | | | | |
| | The area of the flat bit is large, and | | | | | |
| | therefore the pressure small. | | | | | |
| Suggest 4 more examples of ways in | Studs on football boots sink into the | | | | | + |
| which pressure is used in everyday life. | ground | | | | | |
| in the process of the second and the | A sharp knife cuts things easily | | | | | |
| | A camel has a large foot to prevent it | | | | | |
| | sinking into the sand | | | | | |
| | Large tractor tyres stop the tractor | | | | | |
| | from sinking into the mud | | | | | |

| What is the equation which links: density, | mass Dansitus — | | | | |
|--|---|--|--|--|--|
| mass and volume? | $Density = {volume}$ | | | | |
| What are the units for mass? | Kilograms (kg) | | | | |
| What are the units for volume? | Metres cubed (m³) or centimetres cubed | | | | |
| | (cm³) | | | | |
| What are the units for density? | Kilograms per metres cubed (kg/m³) or | | | | |
| | grams per centimetre cubed (g/cm³) | | | | |
| What is the link between centimetres | They are the same | | | | |
| cubed (cm³) and millilitres (mL)? | | | | | |
| Which state of matter has the greatest | Solids | | | | |
| density (with the exception of water)? | | | | | |
| Why do solids have the greatest density? | The particles are most closely packed | | | | |
| | together in this state | | | | |
| Which state of matter has the smallest | Gases | | | | |
| density (with the exception of water)? | | | | | |
| Why do gases have the smallest density? | The particles are most widely spaced in | | | | |
| | this state | | | | |
| Which piece of equipment is used to | A balance | | | | |
| measure mass? | | | | | |
| Which piece of equipment is used to | A ruler (length x width x height) for | | | | |
| measure volume? | regular shapes | | | | |
| | Or | | | | |
| | A measuring cylinder if a displacement | | | | |
| | can is used | | | | |
| How should a displacement can be used | 1. Fill the displacement can with water | | | | |
| to measure volume of an irregular shape? | 2. Add the object and collect the water | | | | |
| | which run out of the spout in a | | | | |
| | measuring cylinder | | | | |

| What is a wave? | A transfer of energy without the transfer | | | | |
|---|---|--|--|--|--|
| | of matter | | | | |
| What are the 3 key properties which are | Amplitude | | | | |
| used to describe a wave? | Wavelength | | | | |
| | Frequency | | | | |
| What is the definition for the amplitude | The maximum displacement of a point on | | | | |
| of a wave? | the wave from its rest position (or – the | | | | |
| | height of the wave) | | | | |
| What are the units for amplitude? | Metres (m) | | | | |
| What is the definition for the wavelength | The distance between equivalent points | | | | |
| of a wave? | on adjacent waves (or – the distance | | | | |
| | between 2 peaks on a wave) | | | | |
| What are the units for wavelength? | Metres (m) | | | | |

| M/bat is the definition for the fragues of | The number of verse position a point in | 1 1 | 1 | | | |
|---|--|----------|---|--|---|---|
| What is the definition for the frequency of a wave? | The number of waves passing a point in | | | | | |
| | one second | | | | | - |
| What are the units for frequency? | Hertz (Hz) | | | | | - |
| What causes a sound? | A vibrating object | | | | | |
| How does sound travel from the vibrating | The vibrating object causes particles in | | | | | |
| object to our ears? | the medium (normally the air) to vibrate, | | | | | |
| | transferring the energy to our ears | | | | | |
| How is sound detected by our ears? | The eardrum vibrates | | | | | |
| In a sound wave, do the particles in the | Parallel | | | | | |
| medium (air) vibrate parallel or | | | | | | |
| perpendicular (at right angles) to the | | | | | | |
| direction that the wave is moving? | | | | | | |
| How can a sound be made louder? | Increasing the size of the vibrations | | | | | |
| Which property of the wave would this | The amplitude | | | | | |
| increase? | | | | | | |
| Why do sounds get quieter the further | The vibrations lose energy, causing | | | | | |
| away that you get from the source? | particles to vibrate with a smaller | | | | | |
| | amplitude | | | | | |
| How do sounds echo? | The sound waves are reflected by a | | | | | |
| | boundary | | | | | |
| What is an important use of this? | Echo-location (e.g. to locate shipwrecks, | | | | | |
| , | submarines etc. and to determine the | | | | | |
| | depth of the sea) | | | | | |
| Which states of matter can sounds travel | Solids, liquids and gases | | | | | |
| through? | Solids, inquites and gases | | | | | |
| Why can sound not travel through a | There are no particles to vibrate | H | | | | |
| vacuum? | There are no particles to visitate | | | | | |
| Which state of matter will sounds travel | Solids | + | | | | |
| fastest in? | Solids | | | | | |
| Explain why sounds will travel fastest in | The particles are closest together, | | | | | |
| solids. | allowing the vibrations to be transferred | | | | | |
| solius. | most easily | | | | | |
| | Those easily | | | | | |
| | | | | | | |
| Suggest a mothed for measuring the | Stand in front of a wall (or cliff) and | \vdash | | | + | |
| Suggest a method for measuring the | Stand in front of a wall (or cliff) and bang two sticks together | | | | | |
| speed of sound. | 2. Measure the time taken for the echo | | | | | |
| | to reach you | | | | | |
| | | | | | | |
| | 3. Use: $Speed = \frac{distance}{time}$ to determine | | | | | |
| | the speed of the wave | | | | | |
| | Note: remember to double to distance to | | | | | |
| | the wall because the sound has travelled | | | | | |
| | there and back | | | | _ | |
| What is the speed of sound? | 330 m/s | | | | _ | |
| What is the speed of light? | 300000000 m/s (300 million m/s) | | | | | |
| Suggest two situations where we can | Thunder and lightning | | | | | |
| detect the difference in speed between | Fireworks | | | | | |
| sound and light. | | | | | | |

| Which piece of scientific equipment can | Oscilloscope | | | | |
|--|-----------------------------------|--|--|--|--|
| produce an image (or trace) of a sound | | | | | |
| wave? | | | | | |
| What will cause a higher pitch sound? | A higher frequency vibration (or | | | | |
| | vibrations per second) | | | | |
| What range of frequencies can be | 20 – 20000 Hz | | | | |
| detected by humans? | | | | | |
| What happens to this range of hearing as | It gets smaller (~30 – 16000 Hz) | | | | |
| you get older? | | | | | |
| What could be the effects on the ear of | Perforated (broken) ear drum – | | | | |
| hearing very loud sounds? | temporary deafness | | | | |
| | Damage to the cochlea – permanent | | | | |
| | deafness | | | | |

| What is the term used for an object | Luminous | | | | |
|---|--|--|--|--|--|
| which gives out light? | | | | | |
| How does light travel? | As a wave | | | | |
| | In straight lines | | | | |
| | At 300 million m/s | | | | |
| How can non-luminous objects be seen? | Light is reflected by these objects | | | | |
| In which direction do light rays travel? | From a luminous object to your eyes | | | | |
| What is the term used for an object | Opaque | | | | |
| which absorbs or reflects light (does not | | | | | |
| transmit light)? | | | | | |
| What is the term used for an object | Translucent | | | | |
| which transmits and scatters light? | | | | | |
| What is the term used for an object | Transparent | | | | |
| which transmits light in straight lines? | | | | | |
| How are shadows made? | An opaque object is placed in front of a | | | | |
| | light source | | | | |
| What is the effect of moving an opaque | The shadow created will be larger | | | | |
| object closer to the light source? | | | | | |
| Why can light travel through a vacuum? | It doesn't need particles to be | | | | |
| | transmitted | | | | |
| What is the law of reflection? | Angle of incidence = angle of reflection | | | | |
| What is the 'normal'? | A line at 90° to the surface of the mirror | | | | |
| What is the angle of incidence? | The angle made between the incoming | | | | |
| | ray of light and the normal | | | | |
| What is the angle of reflection? | The angle made between the reflected | | | | |
| | ray of light and the normal | | | | |
| What types of objects make good | Smooth, shiny surfaces | | | | |
| mirrors? | | | | | |
| What happens when light is reflected by | The rays are scattered | | | | |
| a rough surface? | | | | | |
| | | | | | |

| Miles Could be a series and Could be | D. C. C. | 1 1 | | | l | | _ |
|---|---|-----|--|--|---|---|---|
| What is the name used for this | Periscope | | | | | | |
| arrangement of mirrors? | | | | | | | |
| Light Ray | | | | | | | |
| Eye | | | | | | | |
| What might a periscope be used for? | Seeing over a wallIn submarines to see above the water | | | | | | |
| Use this diagram to explain how a pinhole | 1. Light (or reflected light) from the | | | | | | |
| camera works: | object passes through the pinhole | | | | | | |
| piobole | 2. The light hits the screen at the back | | | | | | |
| Pulling | of the camera | | | | | | |
| | 3. The image is upside down because | | | | | | |
| real object image of object on screen | the light rays travel in straight lines | | | | | | |
| What is a pinhole camera used to | An eye | | | | | | |
| represent (in a very basic way)? | | | | | | | |
| What is the name used to describe the | Refraction | | | | | | |
| bending of light due to a change in the | | | | | | | |
| density of the medium? | | | | | | | |
| If light passes from a less dense medium | It will slow down | | | | | | |
| (e.g. air) to a more dense medium (e.g. | | | | | | | |
| water or glass), what will happen to the | | | | | | | |
| speed of the wave? | | | | | | | |
| If light passes from a less dense medium | It will bend towards the normal | | | | | | |
| (e.g. air) to a more dense medium (e.g. | | | | | | | |
| water or glass), what will happen to the | | | | | | | |
| direction of the wave? | | | | | | | |
| If light enters a medium with a difference | It will continue in the same direction | | | | | | |
| density whilst travelling along the normal, | | | | | | | |
| what will happen to the direction of the | | | | | | | |
| wave? | | | | | | | |
| What is the difference between different | The frequency | | | | | | |
| colours of light? | A set to see Cell Cell 1995 | | | | | - | |
| What is white light? | A mixture of all of the different colours of | | | | | | |
| In order what are the different relevant | light | | | | | _ | |
| In order, what are the different colours in | Red | | | | | | |
| white light? | Orange Yellow | | | | | | |
| | Green | | | | | | |
| | Blue | | | | | | |
| | Indigo | | | | | | |
| | Violet | | | | | | |
| | | | | | | | |

| What happens when white light is passed | It is split up into each of the different | | | | | |
|---|--|--|--|--|--|--|
| through a water drop (or a prism)? | colours to produce a rainbow | | | | | |
| What is the name for this effect? | Dispersion | | | | | |
| Why does dispersion happen? | Different colours of light are refracted | | | | | |
| | (bent) by different amounts. Red is | | | | | |
| | refracted least. Violet is refracted most. | | | | | |

| What does this circuit symbol represent? Lamp/bulb What does this circuit symbol represent? Motor What does this circuit symbol represent? Open SPST switch | |
|--|--|
| What does this circuit symbol represent? What does this circuit symbol represent? What does this circuit symbol represent? Motor | |
| What does this circuit symbol represent? What does this circuit symbol represent? What does this circuit symbol represent? Motor | |
| What does this circuit symbol represent? What does this circuit symbol represent? What does this circuit symbol represent? Motor | |
| What does this circuit symbol represent? Lamp/bulb What does this circuit symbol represent? Motor | |
| What does this circuit symbol represent? Motor | |
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| | |
| What does this circuit symbol represent? Open SPST switch | |
| | |
| | |
| What does this circuit symbol represent? Closed SPST switch | |
| | |
| What does this circuit symbol represent? Battery | |
| | |
| What does this circuit symbol represent? Fuse | |
| | |
| What does this circuit symbol represent? Light dependent resistor (LDR) | |
| | |
| | |

| What does this circuit symbol represent? | Diode | | | | | ٦ |
|---|---|--|--|--|--|---|
| | | | | | | |
| What does this circuit symbol represent? | Light emitting diode (LED) | | | | | |
| What does this circuit symbol represent? | Fixed resistor | | | | | |
| What does this circuit symbol represent? | Variable resistor | | | | | |
| What does this circuit symbol represent? | Push-button switch | | | | | |
| What does this circuit symbol represent? | Relay | | | | | |
| What does this circuit symbol represent? | Ammeter | | | | | |
| What does this circuit symbol represent? | Reed switch | | | | | _ |
| What does this circuit symbol represent? | Junction of conductors (or wires) | | | | | |
| What is a series circuit? | A circuit which only has one path for the electrons to take | | | | | |
| What is a parallel circuit? | A circuit which has multiple paths which the electrons can take | | | | | |
| In a series circuit, what is the effect of adding another bulb? | The bulbs will be dimmer | | | | | |

| In a sories sirewit, what is the offeet of | The hulbs will be brighter | | | 1 | | | | |
|--|--|----------|---|---|--|---|---|--|
| In a series circuit, what is the effect of | The bulbs will be brighter | | | | | | | |
| adding another battery (or increasing the | | | | | | | | |
| voltage of the power pack)? | | | | | | | | |
| In a series circuit, what is the effect of | All of the other bulbs will go out | | | | | | | |
| one of the bulbs breaking? | | | | | | | | |
| In a parallel circuit, what is the effect of | The brightness will not change | | | | | | | |
| adding another bulb (in a separate | | | | | | | | |
| branch)? | | | | | | | | |
| In a parallel circuit, what is the effect of | The bulbs will be brighter | | | | | | | |
| adding another batter (or increasing the | | | | | | | | |
| voltage of the power pack)? | | | | | | | | |
| In a parallel circuit, what is the effect of | All of the other bulbs will remain lit | | | | | | | |
| one of the bulbs breaking? | All of the other bails will remain it | | | | | | | |
| What are the units for current? | Amperes (or amps) (A) | | | | | | | |
| | 1 1 1 1 1 1 1 | | | | | | | |
| Which component is used to measure the | Ammeter | | | | | | | |
| current? | | \sqcup | _ | - | | | _ | |
| Should an ammeter be connected in | In series (because the electrons need to | | | | | | | |
| series or in parallel? | flow through it) | | | | | | | |
| In a series circuit, how does the current | The current is the same everywhere in a | | | | | | | |
| vary? | series circuit | | | | | | | |
| In a parallel circuit, how does the current | The current is split amongst the branches. | | | | | | | |
| vary? | The electrons them recombine to go | | | | | | | |
| · | through the battery (or cell) | | | | | | | |
| What is electrical resistance? | A measure of the difficulty of passing | | | | | | | |
| | electric current through a material or | | | | | | | |
| | component | | | | | | | |
| Suggest 3 materials with a low resistance. | Metals (particularly copper) | | | | | | | |
| Suggest 5 materials with a low resistance. | Graphite (in pencils) | | | | | | | |
| | , , , , , | | | | | | | |
| What is another name for materials with | Salt water Electrical conductors | | | | | | | |
| | Electrical conductors | | | | | | | |
| a low resistance? | | | | | | | | |
| Suggest 3 materials with a high | Rubber | | | | | | | |
| resistance. | Wood | | | | | | | |
| | • Air | | | | | | | |
| What is another name for materials with | Electrical insulators | | | | | | | |
| a high resistance? | | | | | | | | |
| How can the resistance in a circuit be | Adding components (e.g. bulbs, buzzers, | | | | | | | |
| increased? | motors, resistors) | | | | | | | |
| What is a fixed resistor? | A resistor which has a constant resistance | | | | | | | |
| What is a variable resistor? | A resistor where the resistance can be | | | | | | | |
| | changed | | | | | | | |
| What is a light dependent resistor? | A resistor where the resistance changes | | | | | | | |
| The state of the separation of | depending on the light intensity | | | | | | | |
| What is the effect of increasing the light | High light intensity = lower resistance | \vdash | | - | | | + | |
| | ingi ight intensity – lower resistance | | | | | | | |
| intensity on the resistance of an LDR? | A southele publish to a sound of a distance of | \vdash | | - | | _ | | |
| What is a reed switch? | A switch which is opened and closed | | | | | | | |
| | using a magnetic field | | | 1 | | | | |

| Turk at the control of the 12 | A straight high and had a surface and fit | | | | |
|--|---|--|--|--|--|
| What is a relay circuit? | A circuit which can be turned on an off | | | | |
| | using another circuit. This involves an | | | | |
| | electromagnet and a reed switch | | | | |
| What is the effect of increasing the | The current will decrease | | | | |
| resistance in a circuit on the current? | | | | | |
| Explain why the current decreases when | The electrons move more slowly because | | | | |
| the resistance is increased. | it is harder for them to move through the | | | | |
| | circuit | | | | |
| In the series circuit below, what is the | Lamp A will be off | | | | |
| effect of opening the switch on each of | Lamp B will be off | | | | |
| lamp A, B and C? | Lamp C will be off | | | | |
| | · | | | | |
| Switch | | | | | |
| Lamp A | | | | | |
| E Battery Lamp B | | | | | |
| Lamp C | | | | | |
| | | | | | |
| In the parallel circuit below, what is the | Lamp 1 will be off | | | | |
| effect of opening switch 1 on each of | Lamp 2 will be off | | | | |
| lamp 1, 2 and 3 (assuming that all other | Lamp 3 will be off | | | | |
| switches are closed)? | | | | | |
| S ₁ S ₅ | | | | | |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | | | | | |
| | | | | | |
| S ₃ L ₂ | | | | | |
| | | | | | |
| S₄ | | | | | |
| In the parallel circuit below, what is the | Lamp 1 will be off | | | | |
| effect of opening switch 2 on each of | Lamp 2 will be on | | | | |
| lamp 1, 2 and 3 (assuming that all other | Lamp 3 will be on | | | | |
| switches are closed)? | Lamp 5 Will be on | | | | |
| 1 | | | | | |
| S_1 S_5 L_1 | | | | | |
| - | | | | | |
| S ₂ L ₂ | | | | | |
| \longrightarrow | | | | | |
| S ₄ L ₃ | | | | | |
| | | | | | |
| In the parallel circuit below, what is the | Lamp 1 will be on | | | | |
| effect of opening switch 3 on each of | Lamp 2 will be off | | | | |
| lamp 1, 2 and 3 (assuming that all other | Lamp 3 will be on | | | | |
| switches are closed)? | | | | | |
| S ₁ S ₅ | | | | | |
| S ₂ L ₁ | | | | | |
| | | | | | |
| S ₃ L ₂ | | | | | |
| | | | | | |
| S ₄ L ₃ | | | | | |
| | | | | | |

| In the parallel circuit below, what is the | Lamp 1 will be on | | | | | |
|--|---|--|---|--|--|--|
| effect of opening switch 4 on each of | Lamp 2 will be on | | | | | |
| lamp 1, 2 and 3 (assuming that all other | Lamp 3 will be off | | | | | |
| switches are closed)? | Lamp 5 will be on | | | | | |
| Switches are closed): $S_1 \bigvee S_2 \bigvee L_1 \bigvee S_5 \bigvee S_3 \bigvee L_2 \bigvee S_4 \bigvee L_3 \bigvee S_4 \bigvee S_4 \bigvee S_4 \bigvee S_4 \bigvee S_4 \bigvee S_5 \bigvee S_5 \bigvee S_5 \bigvee S_6 \bigvee S_7 \bigvee S_8 \bigvee $ | | | | | | |
| What is a fuse used for? | Protecting electrical appliances from | | | | | |
| | power surges. | | | | | |
| How does a fuse work? | If the current is too high, the wire inside | | | | | |
| | the fuse will melt and break. This breaks | | | | | |
| | the circuit. | | | | | |
| Which way should a diode (or LED) be | With the flat side of the triangle closest | | | | | |
| placed in a circuit so that it works? | to the positive side of the cell (or battery) | | | | | |
| | Green | | | | | |
| Why must an LED be placed into a circuit | An LED has very low resistance in one | | ĺ | | | |
| the correct way around? | direction and very high resistance in the | | | | | |
| | other. This means that it will only work if | | | | | |
| | placed the correct way around. | | | | | |
| What are the energy transfers which take | Chemical → Thermal (by light) | | I | | | |
| place in a battery powered torch? | | | | | | |
| What is a short circuit? | When electrons take the easiest route to | | | | | |
| | get back to the battery (e.g. if a piece of | | | | | |
| | wire is placed in parallel with the bulb) | | | | | |

| Which 3 metals elements can be | a Iron | | <u> </u> | J | | | T | \neg | \neg |
|--|--|----------|----------|----------|---|---|---|----------|---------|
| | • Iron | | | | | | | | |
| magnetised? | CobaltNickel | | | | | | | | |
| What is the term used to describe a piece | | | | | | | | + | + |
| What is the term used to describe a piece | A permanent magnet | | | | | | | | |
| of metal which is always magnetic? | | | | | | | | _ | _ |
| What is the term used to describe a piece | A temporary magnet | | | | | | | | |
| of metal has been magnetised due to | | | | | | | | | |
| being brought inside a magnetic field? | | | | | | | | _ | |
| What are the two ends of a magnet | North pole and south pole | | | | | | | | |
| called? | | | | | | | | _ | |
| Is magnetism a contact or a non-contact | Non-contact because the magnet and the | | | | | | | | |
| force? | other object do not need to be touching | | | | | | | | |
| | for a force to act | | | | | | | | |
| Why is magnetism a non-contact force? | Magnets have a magnetic field which | | | | | | | | |
| | extends beyond the magnet itself | | | | | | | | |
| Is the force between a magnet and | Attractive | | Ţ | Ī | | | | | |
| unmagnetized iron attractive for | | | | | | | | | |
| repulsive? | | | | | | | | | |
| Is the force between opposite poles on | Attractive | | | | | | | | |
| different magnets attractive for | | | | | | | | | |
| repulsive? | | | | | | | | | |
| Is the force between like (the same) poles | Repulsive | | | | | | | | |
| on different magnets attractive for | • | | | | | | | | |
| repulsive? | | | | | | | | | |
| Which piece of equipment can be used to | A compass (or plotting compass) | | | | | | | | |
| detect, and draw the shape of, a | | | | | | | | | |
| magnetic field? | | | | | | | | | |
| Why does a compass point north on | The Earth has a magnetic field | | | | | | | + | |
| Earth? | | | | | | | | | |
| Which part of the Erath does the north- | The magnetic south pole (geographical | | | | | | | _ | _ |
| seeking end of a compass point to? | north pole) | | | | | | | | |
| Which is the direction of the magnetic | North to south | | | | | | | + | - |
| field lines around a bar magnet? | 110.01.00 300011 | | | | | | | | |
| Where is the magnetic field around a bar | It is strongest next to the poles. | \vdash | + | \dashv | | - | | \dashv | + |
| magnet strongest and how do you know | The magnetic field lines are closest | | | | | | | | |
| this? | together at these points. | | | | | | | | |
| uiis: | together at these politis. | | | | | | | | |
| | | | | | | | | | |
| How can you show that putting a current | • Use iron filings to observe the share | | | \dashv | | | | \dashv | + |
| How can you show that putting a current | Use iron filings to observe the shape of the field | | | | | | | | |
| through a piece of wire induces (creates) | | | | | | | | | |
| a magnetic field? | Use plotting compasses | | - | \dashv | - | - | | - | _ |
| What is the definition for a solenoid? | A coil of wire with a current flowing | | | | | | | | |
| NATIONAL CONTRACTOR OF THE CON | through it | | | \dashv | | _ | | \dashv | \perp |
| What are 3 ways of increasing the | Increasing the current | | | | | | | | |
| strength of an electromagnet? | Increasing the number of coils | | | | | | | | |
| National Color | Adding an iron core (such as a nail) | | _ | _ | | _ | | - | _ |
| Where is the strength of the magnetic | In the centre of the coil | | | | | | | | |
| field in a solenoid strongest? | | | | | | | | | |

| What is the effect of reversing the | The direction of the magnetic field will | | | | | |
|-------------------------------------|--|--|--|--|---|--|
| current? | change | | | | | |
| Suggest 4 uses of electromagnets. | Electric bells | | | | ĺ | |
| | Picking up cars in a scrap-yard | | | | | |
| | Relay circuits | | | | | |
| | In magnetic door locks | | | | | |

| What word is used to describe the shape | (Approximately) spherical | | | | |
|---|---|--|--|--|--|
| of the Sun, Earth and Moon? | | | | | |
| How long does it take for the Earth to | 24 hours (1 day) | | | | |
| spin on its axis? | | | | | |
| Why do we experience day and night? | As the Earth spins on its axis, part of the | | | | |
| | Earth will be facing the sun and part will | | | | |
| | be facing away from the sun | | | | |
| Which direction does the Sun appear to | From East to West | | | | |
| move across the sky? | | | | | |
| Why are shadows longer in the morning | The Sun is lower in sky | | | | |
| than at midday? | | | | | |
| How long does it take for the moon to | 28 days | | | | |
| orbit the Earth? | | | | | |
| How long does it take for the Earth to | 365.25 days (1 year) | | | | |
| orbit the Sun? | | | | | |
| What is the name given to the shape of | An elliptical orbit | | | | |
| the path which the Earth takes around | | | | | |
| the Sun? | | | | | |
| How many planets are there in our solar | 8 | | | | |
| system? | | | | | |
| What are the names of these planets (in | Mercury | | | | |
| order from closest to the Sun)? | Venus | | | | |
| | Earth | | | | |
| | Mars | | | | |
| | Jupiter | | | | |
| | Saturn | | | | |
| | Uranus | | | | |
| | Neptune | | | | |
| What is a moon? | A non-luminous, naturally occurring, | | | | |
| | satellite for a planet | | | | |
| How do we see the moon? | Light from the Sun is reflected by the | | | | |
| | moon, and then down to the Earth | | | | |
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| Why do the northern and southern hemispheres experience different seasons? | The Earth's axis is tilted This means that the northern hemisphere will be tilted either towards or away from the Sun | | | | |
|--|---|--|--|--|--|
| | When it is tilted towards the sun, the concentration of light rays hitting the Earth is higher | | | | |
| | This means that it is summer For the other half of the year, the northern hemisphere will be tilted away from the sun, meaning a lower concentration of light rays from the sun and hence colder weather | | | | |
| During summer, what do we know about | The Sun is higher in the sky | | | | |
| the height of the sun and the length of shadows? | Therefore, there are shorter shadows | | | | |
| During what time of year are days longer in the northern hemisphere? | Summer | | | | |
| When does a lunar eclipse take place? | When the Earth is between the moon and the Sun | | | | |
| Why does a lunar eclipse take place? | Light from the Sun is blocked by the Earth (creating a shadow), meaning that no light can be reflected by the moon | | | | |
| When does a solar eclipse take place? | When the moon is between the Earth and the Sun | | | | |
| Why does a solar eclipse take place? | Light form the Sun is blocked by the moon (creating a shadow on the Earth) | | | | |
| What is represented by the diagram below? | A solar eclipse | | | | |
| What is represented by the diagram below? | A lunar eclipse | | | | |
| Put these in order of size (smallest to | Moon | | | | |
| largest): | Planet | | | | |
| Star | Star | | | | |
| Planet | Solar system | | | | |
| Universe | Galaxy | | | | |
| Solar system | Universe | | | | |
| Moon | | | | | |
| Galaxy | | | | | |
| What is a galaxy? | A collection of stars and planets | | | | |
| Which galaxy is the Earth in? | Milky Way | | | | |
| What is the nearest star to the Earth? | Sun | | | | |

| Why can we see stars? | They are luminous (give out their own light) | | | | |
|---|---|--|--|--|--|
| Why can we see planets? | Light from the Sun is reflected by the planet | | | | |
| What is the unit used to measure astronomical distances? | Light years | | | | |
| What is a light year? | The distance travelled in one year by light (over 9 trillion km) | | | | |
| Why do the planets orbit the Sun? | The Sun has a large gravitational field which attracts the planets | | | | |
| Which objects will have a gravitational field? | Anything with mass | | | | |
| Why can we not detect the gravitational field of an apple? | The mass is too smaller Larger mass = larger gravitational field strength | | | | |
| What is the gravitational field strength on Earth? | 10 N/kg | | | | |
| Which planet will experience the largest gravitational force? Why? | Mercury because it is closest to the Sun | | | | |
| Why do the planets not fall into the Sun? | They are moving sideways, and therefore constantly falling around the Sun | | | | |
| Give 4 ways in which artificial satellites are used around the Earth? | To study and predict weather patterns For navigation (and GPS) For communication For observation (spy and military satellites) | | | | |
| What is meant by the term 'geostationary orbit'? | A satellite which stays above the same geographical point on Earth (it takes the same amount of time to orbit the Earth as the Earth does to rotate on its axis). | | | | |
| What is meant by the term 'high elliptical orbit'? | A satellite which moves closer to, and then further away from the Earth during its orbit | | | | |
| What is meant by the term 'polar orbit'? | A satellite which orbits from the North pole to the South pole | | | | |
| What is meant by the term 'low Earth orbit' | A satellite which orbits very close to the Earth and therefore has a short orbit time | | | | |

Revisiting plan

| Page | Date became | Planned review | Date that confidence | Planned review | Date that confidence |
|--------|-------------|----------------|----------------------|----------------|----------------------|
| number | confident | date 1 | returned | date 2 | returned |
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Revisiting plan