S2 Sci U1 Healthy Bodies – Lungs LEARNING OUTCOMES part 1

	Learning outcomes – you should know
1 Surviving & Organs	☐ to survive we need ○ energy and nutrients from food ○ water ○ warmth ○ oxygen ○ to get rid of wastes (Carbon dioxide, toxic chemicals, undigested food) ○ protection from disease ○ to sense the environment ☐ label on a diagram of the body the brain, lungs, heart, stomach, intestines, kidney, bladder, liver
2 Gas exchange	☐ in the lungs oxygen from the air moves into the blood and carbon dioxide moves from the blood to the air. ☐ lime water is used to test for carbon dioxide ☐ the more oxygen there is in air the longer a flame will burn
3 Lungs	☐ the lungs are found inside our ribcage on either side of the heart. ☐ the windpipe takes air in and out of the lungs ☐ the wind pipe splits into smaller tubes called bronchi ☐ the bronchi split into smaller tubes called bronchioles ☐ at the end of each bronchiole are the air sacs ☐ the lungs are spongy, pink and are made up of millions of air sacs. ☐ label a diagram with the parts of the lungs
4 Breathing movements	☐ breathing movements are caused by the muscles between the ribs and the diaphragm muscle ☐ when we breathe in the rib cage moves up and out & the diaphragm moves down ☐ when we breathe out the rib cage moves down and in & the diaphragm moves up

S2 Sci U1 Healthy Bodies – Lungs LEARNING OUTCOMES part 2

5 Keeping the Lungs Clean	☐ the lungs are kept clean by the action of mucus and tiny hairs in the air passages ☐ the mucus traps dirt and germs which may be in the inhaled air ☐ the tiny hairs which beat to and fro to sweep the mucus up to your throat
6 Effects of Smoking	☐ nicotine in cigarette smoke paralyses the tiny hairs preventing them from cleaning the lungs. ☐ Carbon monoxide is a poisonous gas found in cigarette smoke. This gas reduces the ability of the blood to carry oxygen. ☐ The tar in cigarette smoke sticks to the airways and increases the risk of cancer.
7 Lung Measurements	☐ making measurements of the lungs can tell us about their health ☐ **vital capacity** is the maximum volume of air we can breathe out after we have taken a deep breath. ☐ Age, gender, size and fitness affect your vital capacity ☐ age – vital capacity reaches a maximum by the age of 20 ☐ gender – females have lower vital capacities than males ☐ size – the taller you are, the greater your vital capacity ☐ fitness – endurance training gradually increases your vital capacity ☐ **tidal volume** is the volume of air breathed in and out in a normal breath. ☐ **peak flow** is a measure of the maximum rate at which air can be forced from the lungs. ☐ peak flow rate can be used as a measurement of health, eg it can be used in the diagnosis and management of asthma

S2 Science Unit 2 Metals - Learning Outcome Checklist- PART 1

Lesson	by the end of each lesson you should know…
1 Elements & the Periodic Table	☐ an element is a pure substance made up of only one type of atom ☐ elements are arranged in groups in the Periodic Table ☐ most elements are metals the others are non-metals ☐ the columns in the Periodic Table show the different groups of elements
2 The properties of metals	the main properties of metals are ☐ conductor of heat ☐ conductor of electricity ☐ shiny ☐ ductile (can be rolled into wires) ☐ malleable (can be hammered into shape) ☐ strong ☐ sonorous (makes a sound when hit)
3 Alkali Metals	☐ group 1 of the Periodic Table is the alkali metals ☐ the alkali metals are the most reactive ☐ they must be stored under oil to keep them safe ☐ they produce hydrogen gas and an alkali when they react with water ☐ hydrogen gas is flammable and can burst into flames
4 Reactivity of metals	☐ hydrogen gas is produced when a metal reacts with water or acid ☐ hydrogen gas makes a 'pop' when tested with a burning splint ☐ calcium is more reactive than magnesium ☐ magnesium is more reactive than zinc
5 Extraction of metals	☐ unreactive metals can be found in their pure form e.g. gold ☐ panning for gold can separate it from sand/rocks
6 Extraction of metals	☐ more reactive metals must be extracted from their ores ☐ copper can be separated from copper oxide by heating it with carbon

S2 Science Unit 2 Metals - Learning Outcome checklist- PART 2

Lesson	by the end of each lesson you should know…
7 Getting iron	☐ iron is obtained from iron ore ☐ in a blast furnace iron is separated from iron oxide using carbon (coke) at high temperatures ☐ hot air is blown in at the bottom of the blast furnace ☐ waste gases leave at the top of the blast furnace ☐ limestone is used to remove the impurities from the molten iron ☐ slag is made from the reaction of limestone with the impurities. ☐ iron can be combined with carbon to make steel for different uses
8 The problem with rust	☐ the corrosion of iron and steel is called rusting ☐ rust forms when iron reacts with oxygen to make iron oxide ☐ rusting occurs when iron is exposed to oxygen (in the air) and water, especially salty water ☐ ferroxyl indicator is used to show rusting ☐ if rust it present ferroxyl indicator turns blue
9 Preventing rusting	☐ rust can be prevented by using physical barriers e.g. ☐ painting, greasing / oiling, plastic coating ☐ rust can be prevented by using chemical protection e.g. ☐ galvanising, adding chromium, sacrificial protection ☐ coating iron in a thin layer of zinc is called galvanizing ☐ adding chromium to iron makes it into stainless steel ☐ attaching iron to a more reactive metal is called sacrificial protection

S2 Science Unit 3 Energy in the Home Learning Outcome Checklist

lesson	Learning Outcomes
1 Burning fuels	☐ compare how much energy fuels release when they burn
2 Energy uses and sources	☐ Energy is required in the home for heating, lighting and the operation of appliances ☐ Energy for the home can come from electricity, gas and solid fuels.
3 Electrical energy costs – appliances	☐ Heating is more expensive than lighting or using appliances ☐ The cost of home heating depends on the fuel used and other factors such as tariffs, installation charges and the period of use. ☐ The power rating of an appliance tells you how much electricity it uses ☐ The power rating of an appliance is measured in watts (W) and kilowatts (kW) ☐ The energy consumption per hour is measured in kilowatt hours (kWh) ☐ The energy consumption per hour is calculated by multiplying the power in kilowatts (kW) by the time the appliance is on for in hours (h) ☐ Electricity suppliers use kilowatt hours as the unit of electricity that they charge for.
4 Electrical energy costs – bills	☐ Energy usage can be calculated from the difference between two meter readings. ☐ The cost of your electricity will depend your usage and the tariff you are on and will have VAT (tax) added on to it ☐ use knowledge of appliances running costs to suggest how to cut cost of electricity bills
5 Heat loss from a house and it's prevention	☐ Energy losses from the home cost money. ☐ Heat can be lost from the roof, walls, windows, floors and doors. ☐ Heat loss can be reduced by • draught-proofing • using an insulating layer (eg double glazing, loft insulation, cavity wall insulation). ☐ Heat loss prevention methods cost money too but save money by reducing your heating bill ☐ The payback time is the time it takes the savings to pay back the cost of the heat loss prevention method
6 Investigating heat loss	☐ In a fair test only one variable is changed ☐ You must repeat an experiment and calculate the average to make the results more reliable
7 Conduction	☐ Heat energy is lost by conduction, convection and radiation. ☐ Conduction is the movement of heat through solids
8 Convection	☐ Convection is the movement of heat upwards through liquids and gases ☐ Convection currents are caused by the particles of liquid or gas moving up when heated

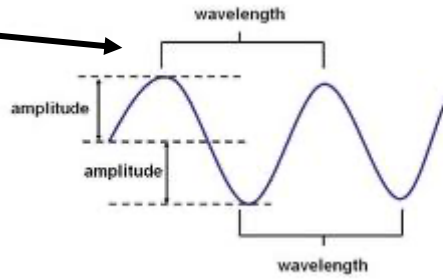
9 Radiation	☐ Radiation is the movement of heat in straight lines and does not need solids, liquids or gases. ☐ Radiation is heat given off in the form of infrared light ☐ Special cameras can detect the infrared light given off by warm objects and make images of them ☐ Infrared images have many uses e.g. detecting heat loss from a house, help firefighters find a victim in a smoke filled room etc

S2 Science Plants Learning Outcome Checklist

lesson	☐ You should know
1. Life cycle of a flowering plant	the order of steps in the life cycle of a flowering plant is- ☐ plant growth ☐ flower formation ☐ pollination ☐ fertilisation ☐ seed & fruit formation ☐ seed dispersal ☐ seed germination
2. Seed structure	☐ seeds are made up of a seed coat, an embryo and a food store ☐ the coat protects the seed ☐ the embryo grows into the new plant ☐ the food store provides energy for germination ☐ the food store contains starch ☐ iodine is used to test for starch
3. Seed dispersal	☐ seeds must be spread away from the parent plant to give the new plants the best chance of survival ☐ seeds can be dispersed by the following methods ☐ animals eating them, animals taking them away for winter food ☐ seeds catching onto animals coats ☐ explosive ☐ wind carrying them away
4. Data Handling practice	☐ To calculate an average – add up all the numbers and divide the total by the number of numbers added up Success criteria for drawing a line graph = ☐ labels on x and y from table, ☐ scales going up in regular steps evenly spaced, ☐ points plotted accurately, ☐ points joined with a ruler-drawn line
5. growing plants from seeds (beans)	☐ observe the stage of germination and plant growth
6. seed germination investigation (cress)	☐ germination is the growth of a seed into a new plant ☐ seeds need water, oxygen and warmth for germination ☐ a fair test is an investigation where only one variable is changed at time ☐ results are more reliable if the experiment is repeated and an average calculated

7. testing a leaf for starch	☐ the steps for testing a leaf for starch ☐ boil the leaf in water to burst open the cells ☐ boil leaf in alcohol to remove the green colour ☐ rinse the leaf in water to soften it ☐ add iodine to test for starch ☐ plants make sugar in their leaves and store it as starch
8. Photosynthesis	☐ photosynthesis is the process where plants make sugar ☐ the 2 raw materials for photosynthesis are carbon dioxide and water ☐ the 2 requirements for photosynthesis are light and green chlorophyll ☐ the 2 products of photosynthesis are food (sugar) and oxygen
9. Water transport in plants	☐ water is taken into a plant by the roots ☐ water is needed in the leaves for photosynthesis ☐ water travels up a plant in tubes called xylem vessels ☐ xylem vessels have rings round them to strengthen them ☐ xylem vessels form rings in a tree trunk - the number of rings tells you the age of the tree
10.Gas exchange in leaves	☐ carbon dioxide must get into the leaf for photosynthesis ☐ oxygen made by photosynthesis must get out of the leaf ☐ the surface of a leaf has tiny holes called stomata to allow gas exchange

S3 Science SOUND WAVES Learning Outcomes

lesson	by the end of this unis I should know…
1 how sound travels	□ a wave transfers energy from one place to another □ sound is caused by vibrations of particles (atom or molecule) of a material / medium □ sound cannot travel through a vacuum, it needs a solid, liquid or gas.
2 Sound Waves	□ sound waves look like □ sound waves have peaks and troughs □ the amplitude of a sound wave is the height from the centre of a wave to its peak or trough □ the wavelength of a sound wave is the distance from one peak to another (or one trough to another) 
3 Pitch and Volume	□ the bigger the amplitude of a sound wave the louder the sound □ the shorter the wavelength of a sound wave the higher the pitch
4 Changing pitch in musical instruments	□ musical instruments change their pitch by changing the length of the part that vibrates to make the sound
5 Hearing range	□ the younger you are the higher the pitch you can hear □ different animals have different hearing ranges □ humans hear sounds between 20 – 20,000 hertz □ data handling – get information from a graph
6 Sound levels	□ the volume of sound is measured in decibels (Db) □ data handling draw a bar graph
7 The ear	□ the location of the parts of the ear on a diagram (check in your jotter) The functions of each part below □ the ear flap collects sound waves □ ear canal channels sound waves into the ear □ the ear drum vibrates when sound waves hit it □ the three small bones (ossicles) pass the vibrations from the ear drum to the cochlea □ in the cochlea the vibrations are turned into electrical signals □ the auditory nerve sends electrical signals to the brain □ the semi-circular canals help with balance
8 Ultrasound	□ ultra sound is sound waves that have a frequency above human hearing range (over 20,000 Hz) □ ultrasound can be used in medicine to get an image of an unborn baby, breakdown kidney stones and to treat muscle strains and ligament sprains □ ultrasound is used by bats to navigate in the dark

S3 Science Unit 6 WATER Learning Outcomes

lesson	by the end of this unit I should know…
1 Uses of water	□ some **domestic** uses of water – cooking washing □ some **agricultural** uses of water – watering crops □ some **industrial** uses of water – cooling towers in power stations □ some uses of water for **leisure –** swimming, sailing □ PS – how to draw a bar graph
2 Water and the Human body	□ some uses of water in the human body – removes waste, cushions joints, regulates body temperature
3 Fresh water from salt water	□ the three states of matter are solid liquid gas □ melting is when a solid changes to a liquid □ evaporating is when a liquid changes to a gas □ freezing is when a liquid changes to a solid □ condensing is when a gas changes to a liquid □ distillation involves boiling water, cooling the gas to condense it □ distillation can be used to get fresh water from salt water
4 Distillation for Survival	□ evaporating dirty / salt water using heat from the sun then condensing and collecting it can be used to produce clean water for survival □ how to make a simple solar still
5 Water Cycle	the following stages of the water cycle □ evaporation – heat from sun causes liquid to change to gas □ transpiration – evaporation of water from plants □ condensation – gas cools and turns into liquid forming clouds □ precipitation- liquid falls as rain, snow, hail □ run off – water returning to sea
6 Water Supply- treatment	□ water is stored in manmade reservoirs □ water is treated and then supplied to homes etc in pipes □ water treatment includes the following stages □ flocculation- adding a chemical that makes the small particles stick together and sink □ filtration- passing water through a bed of sand and gravel to remove some of the particles □ disinfect - add chlorine
7 Hard and soft water	□ hard water has calcium and magnesium ions in it □ the ions in hard water comes from the rocks the water travels through □ hard rocks make soft water and soft rocks make hard water □ soft water makes more lather than hard water □ hard water causes a build up of lime scale on kettles and boilers □ PS - in a fair test only one variable must change, other variables must be controlled

S3 Science Environment Learning Outcomes

lesson	Learning Outcomes
food in plants	□ plants make food by photosynthesis □ plants need to be green, have CO_2 & light to make food □ plants food is stored as starch □ iodine turns brown -> black if starch is present
food chains	□ plants are producers □ producers make the food □ animals are consumers □ consumers get food by eating other living things □ primary consumers are the first animal in a food chain □ secondary consumers are the second animals in a food chain □ animals that eat only plants are herbivores □ animals that eat only other animals are carnivores □ animals that eat plants and animals are omnivores □ energy is lost at each step in a food chain
food webs	□ food webs contain interconnected food chains □ use information about food chains to draw a food web
predator prey relationship	□ population is the number of one type of organism living in an area □ predator is an animal that hunts and kills animals for food □ prey is an animal that is hunted and killed for food □ an increase in prey population will cause an increase in predator population □ an increase in predator population will cause a decrease in prey population □ predator population changes follow the same pattern as prey population changes but lag behind them
stability in food webs	□ use information in a food web to predict the effect of changes in one population size □ the more links there are in a food web the more stable it is
energy loss in food chains	□ at each step in a food chain energy is lost □ energy is used by the animal for growth, moving, keeping warm. □ energy is lost in the waste produced by the animal □ The energy used to keep warm and to move and the energy lost as waste is not available to the next animal in the chain
pyramid of numbers	□ the numbers of each organism in a food chain decrease as you go up the chain □ a pyramid of numbers shows the numbers of each organism in a food chain □ if a food chain involves a large producer or a small consumer the shape will not be a pyramid
adaptations	□ an adaptation is a feature of a plant or animal that helps it to survive in its environment
endangered species	□ many species have become extinct due to the activities of humans □ endangered species are those with numbers that are so low they may become extinct □ human activities that are endangering organisms are - deforestation, over fishing, over hunting □ endangered organisms can be protected by conservation methods □ conservation methods include national parks, captive breeding in zoos, fishing quotas, hunting bans