Science Knowledge Organisers

Year 8 PC1 (October Exam)

Kettering Science Academy

What is a 'knowledge organiser'?

A knowledge organiser is simply a collection of the all of the information which your teacher would like you to be able to **recall** from a particular topic. That means that it **does not have everything on it** for a unit of study but it does have **the most essential things to learn.**

A knowledge organiser has lots of facts and definitions on it. Did you know that there is as many new words in studying science as there is in studying a language?

A knowledge organiser does **not develop skills**, so good revision will involve **lots of practice questions** as well as learning the content of these organisers.

What do I do with it?

For most of us, the first thing that we learned at school in reception was our phonics sounds. We learned them by repetition – seeing them again and again until the association between the sound and the image stuck. We need to do the same thing with these knowledge organisers!

Your teacher will probably be using knowledge organisers as you are taught. They will be referred to in class and you should have regular small tests on what you have learned.

Our knowledge organisers are deliberately broken into small lesson sized chunks for you to learn. Typically a teacher may ask you to 'learn box 2 and 3' for a homework.

By the time you come to an assessment – an exam or test – you should already be familiar with the knowledge organisers and already know some of it. They can then be relearned as a part of the revision and assessment preparation procedure.

Retrieval Practice

A key part of learning anything is the act of trying to remember. In class, your teacher will be helping you to do this by asking lots of questions and setting quizzes. **The more often you try to remember something the more likely you are to remember it**. With knowledge organisers you can achieve the same thing at home.

Why are we doing this?

Research has shown that **the more you know** the **more you can learn.** By being able to recall the facts, you are able to understand more complicated ideas because you **already know what the key words mean.** You will also already have a set of ideas in your mind that the new ideas can connect to (this is often referred to as a **schema**).

What are the best techniques for memorising using a knowledge organiser?

READ COVER WRITE

Make sure you are working somewhere quiet and that you have something to write with and some paper. Focus on learning on part of the knowledge organiser only, for example box one. Read through it carefully several times. When you think you've got it, cover over the knowledge organiser and write it all down. Then check what you've been able to remember. Read the bits that you could not recall, cover and write again.

TEST ME

Once you have learned the sections, its time to see if you can remember larger amounts.

Ask a friend or family member to test you on the content of the knowledge organiser page. They don't need to be experts – only to say whether you have remembered it correctly.

TEST EACH OTHER

If you are revising with class mates, testing each other is great. By doing this you are thinking about what you need to know when you are answering questions but also when you are checking to see if your class mate is right. This works well on video calls!

MAKING FLASH CARDS

Some students find making flash cards really helps. You are thinking about what needs to be learned as you write! But don't fall into the trap of writing them and never using them! Once written they should be used regularly – you can test yourself with them or test each other!

Spaced Learning

All of the techniques work best when they are done **little and often**. Aim to repeat something you have learned a week – studies have shown that once you learn something, if you see it again after a week recall is better long term. Then again after a month… and so on.

Application

Once you have memorised some of the information, or have made a good start, it's a good idea to start trying to **use that knowledge**. Websites like **Seneca** and **Educake** provide great banks of questions for this.

7B Sexual Reproduction in Animals

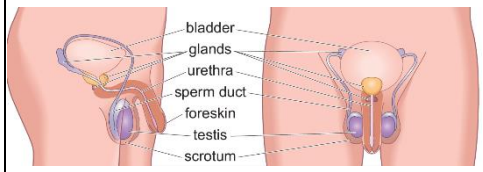
1. Animal Sexual Reproduction

Offspring	The new organisms produced by reproduction.
Sexual Reproduction	Reproduction that needs two parents to produce offspring.
Gametes	Sex cells
Sperm	Gamete that males make
Egg	Gamete that females make
Fertilisation	Sperm enters an egg cell and nuclei fuse forming a fertilised egg cell.
External Fertilisation	The sperm and egg cell meet outside of the body. e.g. fish
Internal Fertilisation	The sperm and egg cell meet inside the body.
Using External Fertilisation	Large numbers of eggs are produced because many get washed away. The parents don't look after their young.
Using Internal Fertilisation	Fewer egg cells produced because sperm is more likely to reach egg. The parents usually look after their young.

2. Reproductive Organs

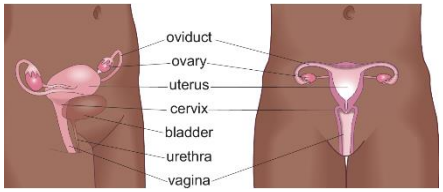
Testes	Where sperm cells are made.
Scrotum	Bag of skin containing the testes.
Sperm Ducts	Sperm travels through here after leaving the testes.
Glands	Fluids are added to the sperm- it is now called semen.
Urethra	The tube the semen leaves the body through.

Male Reproductive System



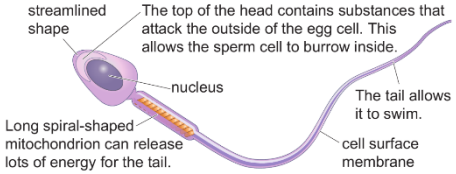
Ovary	Where the egg cells develop and are released from.
Oviduct	Tube lined with cilia (tiny hairs).
Uterus	Where the baby will develop if the egg is fertilised.
Cervix	Ring of muscle between uterus and vagina.
Vagina	Part that leads from the cervix to the outside.

Female Reproductive System

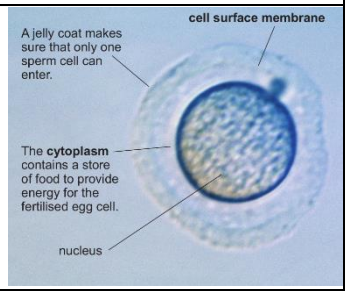


Puberty	When males start to produce sperm cells and egg cells in female start to mature.

Sperm Cell Adaptations



Egg Cell Adaptations



3. Becoming Pregnant

Sexual Intercourse	The erect penis is inserted into the vagina.
Ejaculation	Semen is pumped out of the urethra.
Route the sperm takes	Vagina → sucked up through cervix → uterus → oviduct → meets egg cell
Implantation	If fertilisation occurs the cell starts to divide forming an embryo which will then sink into the uterus lining. The woman is now pregnant.
Amniotic Fluid	Watery fluid to protect growing embryo / foetus.
Amnion	Bag containing the amniotic fluid.
Placenta	Allows oxygen, food and water to be passed from mother's blood into embryo's blood. Waste materials (like carbon dioxide) pass from embryo's blood into mother's blood.
Umbilical Cord	Carries the embryo's blood to and from the placenta.

4. Gestation and Birth

Gestation Period	The time from fertilisation until birth.
Foetus	When an embryo develops a full set of organs we call it a foetus (around 8 weeks).
Ultrasound Scans	Produce images of foetus to check for problems.
Harm to Baby	Alcohol, drugs, cigarette smoke and viruses can pass through placenta and harm foetus.
Premature	Baby born small and early.
Labour	The act of giving birth.
Stages of Giving Birth	1. contractions start and cervix begins to widen. 2. amnion breaks and amniotic fluid leaves vagina. 3. cervix at 10cm, stronger contractions pushes baby through. 4. Umbilical cord cut.
Afterbirth	The placenta is passed out of the vagina- end of labour.
Mammary Glands	Produces milk for babies- contains nutrients and antibodies to protect from disease

5. Growing Up

Sex Hormones	Released by brain, tests & ovaries- start puberty.
Changes to Boys During Puberty	Voice deepens, shoulders widen, hair grows, testes/ penis grow, sperm produced.
Changes to Girls During Puberty	Breasts develop, hair grows, hips widen, ovaries start to release eggs.
Menstrual Cycle	Days 1-5: uterus lining lost from body (**menstruation**) Days 6-14: egg cell starts to mature and is released around day 14 (**ovulation**) Days 14+: egg cell swept towards uterus, if not fertilised cycle starts again.

Lesson	Memorised?
1. Animal Sexual Reproduction	
2. Reproductive Organs	
3. Becoming Pregnant	
4. Gestation & Birth	
5. Growing Up	

7D Ecosystems

1. Variation

Habitat	The place where an organism lives.
Variation	The difference between organisms.
Continuous	Type of variation where the measurement can be any value in a given range. *e.g. height, mass*
Discontinuous	Type of variation where the measurement falls into certain categories. *e.g. eye colour, blood group*
Offspring	The new organism produced by reproduction.
Species	Group of organisms that can reproduce to produce offspring that can also reproduce.
Hybrid	The offspring of two different species. They cannot reproduce.

2. Adaptations

Environment	The conditions in a habitat.
Adaptations	Features that help an organism to survive in the environment where it lives.
Polar Bear Adaptations	• Thick fur to keep warm • small ears to stop heat loss • white fur for camouflage • rough soles to grip ice • large feed to spread out weight / swimming
Cactus Adaptations	• Stem stores water • roots cover large area to absorb water • no leaves to stop water loss
Jack Rabbit Adaptations	• large ears to allow heat to escape • large hind legs to increase running speed • gets all its water from food, doesn't drink

Community	All the animals and plants that live in a habitat.
Ecosystem	The community and all the physical environmental factors together.
Inherited Variation	Variation between features caused by an organism's DNA
Inherited Variation Between Same Species	Gametes contain different instructions for features. A different sperm and egg produce each offspring, so each has different features.
Identical Twins	Identical because they develop from one fertilised egg cell.

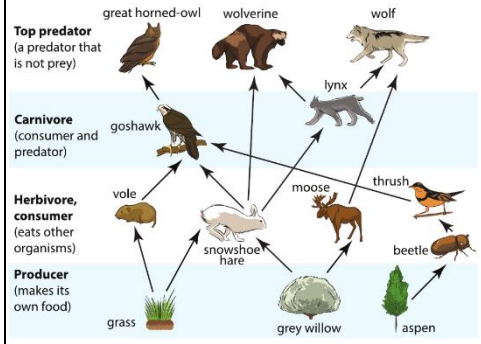
3. Effects of the Environment

Environmental Variation	Variation caused by environmental factors. *e.g. hairstyle, accent*
Daily Changes	Environmental changes during the day.
Seasonal Changes	Environmental changes during the year.
Nocturnal	Animals that are only active at night.
Nocturnal Animal Adaptations	Excellent eyesight Nocturnal owls have superb hearing as well and can fly.
Deciduous	Trees that lose their leaves in winter to stop water loss.
Evergreen	Trees with tougher leaves that don't lose much water so they keep them all year.
Hibernation	Organisms become inactive in winter so they don't need food.
Migration	Birds fly to warmer places for winter to find food.

4. Effects on the Environment

Resources	What an organism needs to survive and grow- oxygen, food, water, etc. for animals.
Population	The numbers of a specific organism.
Food Chain	Represents what eats what in a habitat Grass → hare → lynx
Competition	Organisms compete over the resources that they need.
Food Web	Formed by joining together all food chains in an ecosystem.

Food Web Example



Interdependent	Organisms in an ecosystem all depend on one another.
Predator	Eats another animal.
Prey	Eaten by another animal.

5. Transfers in Food Chains

Food Chain Arrows	Represent energy passed between organisms.
Energy Flow	Energy is lost at each stage along a food chain due to being released by respiration for movement etc. and some food remains undigested.
Pyramid of Numbers	Diagram showing number of each organism at each stage of a food chain. 
Pesticides	Poison that kills pests.
Pests	Organisms that cause problems.
Persistent	Poisons that are not broken down in nature.
Poisons in a Food Chain	Poisons get more concentrated the further along a food chain.
DDT	Persistent pesticide used in the UK that caused bird shells to become weak and break easily. Banned in 1984.

Lesson	Memorised?
1. Variation	
2. Adaptations	
3. Effects of the Environment	
4. Effects on the Environment	
5. Transfers in Food Chains	

7F Acids and Alkalis

1. Hazards

Hazard	Something that could cause harm.
Risk	The chance that a hazard will cause harm.
Hazard Symbols	Internationally agreed symbols representing the type of risk from using a substance.
	**Dangerous to Environment** Can cause long term damage to animal and plant life.
	**Toxic** Poisonous and can cause death if taken into the body.
	**Corrosive** Attacks certain substances like metals, stonework & skin.
	**Explosive** Heating may cause an explosion.
	**Flammable** These substances catch fire easily.
	**Caution** similar to toxic/corrosive but less serious- may cause skin irritation
Diluted	Dangerous substances are mixed with water to make them less dangerous.

2. Indicators

Indicator	A substance that changes colour in solutions of different acidity/alkalinity.
Litmus	An indicator made from a type of lichen.
Acid	Turns litmus indicator **red**.
Alkali	Turns litmus indicator **blue**.
Neutral	A substance that is neither acidic or alkaline.
Red Cabbage	Can be used as an indicator.

3. Acidity and Alkalinity

pH Scale	A scale measuring acidity and alkalinity in numbers.

The pH Scale

Acid	pH lower than 7- the lower the number the more acidic.
Neutral	pH of 7
Alkali	pH higher than 7- the higher the number the more alkaline.
Universal Indicator	Indicator that gives a range of colours depending on the pH.
Acid Rain	Rainwater more acidic than usual due to pollution.

4. Neutralisation

Neutralisation	A reaction where an acid and alkali are mixed together forming a neutral substance.
Chemical Reaction	A change in which one or more new substance is formed.
Word Equation	Used to model chemical reactions.
Reactants	The starting substances- written on left of word equation.
Products	The new substances made- written on right of word equation.
Neutralisation General Word Equation Acid + alkali → salt + water	
Neutralisation Word Equation Example Hydrochloric acid + sodium hydroxide → sodium chloride + water	
Salts	Formed when acids and alkalis react. Different acids and alkalis will form different salts.
Sodium Chloride	The chemical name for common/table salt.

5. Neutralisation in Daily Life

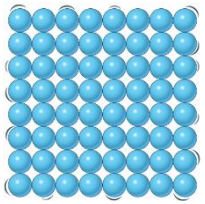
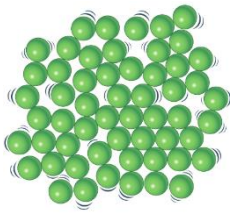
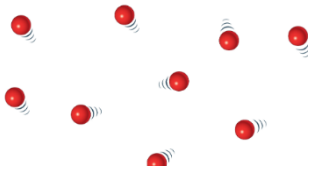
Base	Any substance that neutralises an acid forming a salt and water.
Alkali	A soluble base
Antacids	Remedy for indigestion that neutralise the stomach acid
Antacid Word Equation Example Magnesium hydroxide + hydrochloric acid → magnesium chloride + water	
Toothpaste	Contains bases that neutralise acids in your mouth from food that you eat.
Bee Sting Remedy	A bee sting, being acidic can be treated with a weak alkali like baking soda.
Wasp Sting Remedy	A wasp sting, being alkali, can be treated with a weak acid like vinegar.
Cleaning Metals	Acids clean the rust off metals using a neutralisation reaction.
Waste Gases	Acidic waste gases from industries are sprayed with calcium hydroxide to neutralise them.

Lesson	Memorised?
1. Hazards	
2. Indicators	
3. Acidity & Alkalinity	
4. Neutralisation	
5. Neutralisation in Daily Life	

7G The Particle Model

1. Solids, Liquids and Gases	
States of Matter	The three forms that a substance can be in; solid, liquid or gas.
Solid Properties	Do not flow Fixed shape Fixed volume Cannot be compressed
Liquid Properties	Can Flow No fixed shape Fixed volume Cannot be compressed
Gas Properties	Can flow No fixed shape No fixed volume Can be compressed
Flow	To move and change shape smoothly.
Volume	The amount room something takes up. Measured in cubic centimetres (cm^3).
Compressed	Squashed into a smaller volume.
Pressure	The amount of force pushing on a certain area.

2. Particles	
Particle Theory	A theory used to explain the different properties and observations of solids, liquids and gases.
Particles	Tiny pieces of matter that everything is made out of.
Forces	Tiny forces of attraction hold the particles together.

Solid Particle Properties	Fixed arrangement of particles held closely together that cannot move over each other but vibrate.
Liquid Particle Properties	Held closely together but not in a fixed arrangement and can move over each other.
Gas Particle Properties	Far apart from each other and free to move about in all directions.
Solid Particle Diagram	
Liquid Particle Diagram	
Gas Particle Diagram	
Vibrate	To move backwards and forwards.

3. Brownian Motion	
Brownian Motion	An erratic movement of small specks of matter caused by being hit by the moving particles that make up liquids or gases.
Trace	Used to plot the movement of a particle and used as evidence for Brownian motion.
Molecule	Two or more atoms joined together in a group.
Nanometre	A unit of measurement. 1 nanometre (nm) is 0.000 000 001 metres (m)

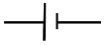
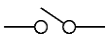
4. Diffusion	
Diffusion	The movement of particles spreading out and mixing with each other without anything moving them.
Particle Theory and Diffusion	Occurs quickly in gases because they are able to move freely in all directions. Diffusion is slower in liquids because the particles are still moving but not as freely as in a gas. Diffusion cannot occur in solids because the particles are in a fixed positon.
Small Intestine	Diffusion of particles of essential substances in our food pass through the wall of the small intestine.

5. Air Pressure	
Air Pressure	The force on a certain area caused by air molecules hitting it.
High Air Pressure	Makes sure tyres are inflated. Can also affect the weather making it dry and settled.
Vacuum	A completely empty space containing no particles (not even air).
Straws	Straws work because when you suck, you reduce the pressure inside the straw so the air pressure outside the straw is grater and the liquid is pushed up.

Lesson	Memorised?
1. Solids, Liquids and Gases	
2. Particles	
3. Brownian Motion	
4. Diffusion	
5. Air Pressure	

7J Current Electricity

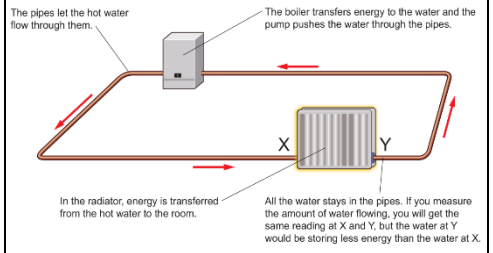
1. Switches and Current

Component	Something in a circuit.
Switch	Closing a switch completes the circuit allowing the current to flow.
Bulbs	Electricity flowing through makes the filament glow.
Current	The amount of electricity flowing around a circuit. Measured in amperes (A).
Current in a Series Circuit	Current is not used up as it goes around the circuit, it is the same everywhere.
Ammeter	Used to measure current.
	Cell circuit symbol
	Bulb circuit symbol
	Switch circuit symbol
	Ammeter circuit symbol

2. Models for Circuits

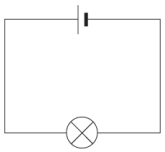
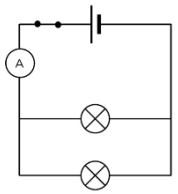
Models	A way of showing or representing something.
Advantages of Using Models	Allow us to help think about complicated ideas in science.
Charges	An electric current is a flow of charges carrying energy from the cells to the components.
Conductors	Charges can move through them easily (e.g. metals).
Insulators	Charges cannot move through them easily.

Model Example

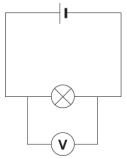
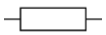
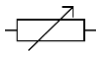


Model Example Explanation	•Boiler represents the cell •Pipes represent the wires •The radiator represents a component •Water represents the current

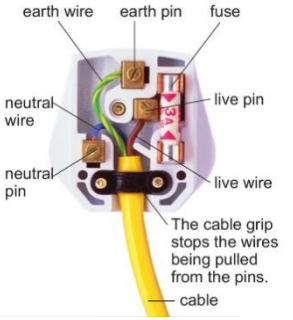
3. Series and Parallel Circuits

Series Circuit	A circuit with all the components in one loop.
Series Circuit Diagram	
Parallel Circuit	A circuit with branches that split apart and join again.
Parallel Circuit Diagram	
Parallel Circuit Advantages	Each bulb/component can be turned on individually. If one bulb/component breaks the components in other branches stay on (unlike a series circuit).
Current in a Parallel Circuit	The current splits when it reaches a branch. The current in all the branches add up to the current in the main part of the circuit.
Adding Bulbs	If you add bulbs into a series circuit the current gets smaller and the bulbs dimmer. In a parallel circuit if you add bulbs on different branches they stay bright.

4. Changing the Current

Voltage	A way of saying how much energy is transferred by electricity. The voltage of the cell helps push the charges around the circuit. Measured in volts (V).
Voltmeter	Used to measure voltage.
Connecting a Voltmeter	Voltmeters are connected across a component. 
Voltage in a Series Circuit	The voltage across all the components adds up the voltage across the cell.
Resistance	How difficult it is for electricity to flow through something.
Resistor	A component that makes it difficult for electricity to flow- reduces size of current.
	Voltmeter circuit symbol
	Resistor circuit symbol
	Variable resistor circuit symbol

5. Using Electricity

Hazard	Something that could cause harm.
Risk	The chance that a hazard will cause harm.
Electricity Risks	Can cause fires, burns to the body and stop the heart from working.
Reducing Risks	Don't touch bare metal parts of plugs, don't poke things into sockets, keep water away from electricity, don't plug too many things into a socket and never use a damaged wire.
Fuse	A wire that melts if the current is too high, breaking the circuit.
Circuit Breaker	Cuts off the current if it is too high.
Plug Wires	**Live** and **neutral** wires make an appliance work; **earth** wire is for safety.
Plug Diagram	

Lesson	Memorised?
1. Switches and Current	
2. Models for Circuits	
3. Series and Parallel Circuits	
4. Changing the Current	
5. Using Electricity	

7L Sound

1. Making Sounds

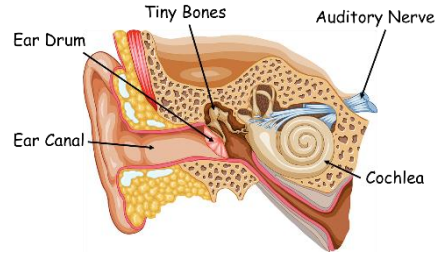
Making Sounds	Sounds are made by something vibrating.
Intensity	How loud or soft a sound is- its volume.
Pitch	How high or low a sound is.
Frequency	The number of vibrations each second. The higher the frequency the higher the pitch.
Hertz (Hz)	The units for measuring frequency.
Amplitude	The size of vibrations. The bigger the amplitude the louder the note.
Humans Making Sounds	Two flaps (vocal folds) across the windpipe vibrate when air moves across them.
Grasshoppers Making Sounds	Male grasshoppers chirp by rubbing one leg against a wing.
Gorillas Making Sounds	Male gorillas thump their chests or thump the ground to threaten other males.

2. Moving Sounds

Moving Sounds	Sounds can only travel through a medium (a solid, liquid or gas).
Vacuum	A completely empty space. Sound cannot travel through.
Particles	Tiny pieces of matter that make up everything.
Sound Moving Through the Air	Air particles vibrate and cause nearby particles to vibrate so the vibrations spread through the air.
Sound Wave	Formed by the moving vibrations.
Pressure Wave	The air particles are pushed together in some place (high pressure) and spread out in other places
Sound Wave Frequency	The number of waves passing a point per second.
Sound Wave Amplitude	The distance moved by air particles as the sound wave passes.
Energy	Energy is transferred from one place to another by sound waves. They do not transfer particles.
Speed of Sound	Sound travels faster in solids because the particles are close together.
Moving Away from A Source	As you move away from a source of sound, the energy carried has spread out further so there is less energy for your ear to detect- it sounds quieter.

3. Detecting Sounds

The Ear

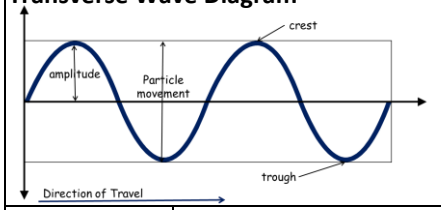
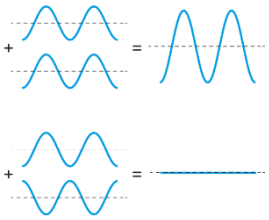


Ear Protection	Loud sounds damage our ears- people who work in noisy surroundings need ear protection. Certain soft materials (carpets, curtains, etc.) also absorb energy transferred by sound waves.
How Ears Detect Sounds	1. sound waves enter the ear canal. 2. the eardrum (a thin membrane) vibrates. 3. vibrations pass to the tiny bones which amplify the vibrations. 4. vibrations pass to the liquid inside the cochlea. 5. tiny hairs inside the cochlea detect vibrations and create electrical signals (impulses). 6. impulses travel along the auditory nerve to the brain.
How Microphones Detect Sounds	Sounds make a thin sheet of materials (a diaphragm) vibrate and electrical circuits convert these vibrations into electrical currents.
Decibels (dB)	The units for measuring the loudness of a sound.
Auditory Range	The range of frequencies an organism can hear 20Hz – 20000Hz in humans
Infrasound	Sounds below 20Hz
Ultrasound	Sounds above 20000Hz

4. Using Sound

Using Sound	Sound is often used for communication.
Transmitted	Energy from sound waves goes through some materials.
Reflected	Energy from sound waves bounces off some materials.
Using High Frequency Waves	• Treat injuries • Clean delicate objects by making tiny bubbles that loosen dirt when the burst.
Echo	A reflected sound
Echolocation	Used by animals (bats, dolphins, etc.) to find their way around/find prey.
Sonar	Pulse of ultrasound is given off and reflected by the sea bed. It is then detected by sonar equipment to find the depth.

5. Comparing Waves

Longitudinal Waves	Particles vibrate in same direction wave is moving.
Transverse Waves	Particles vibrate at right angles to direction wave is moving.
Transverse Wave Diagram	
Superposition	As waves pass through each other their effects add up or cancel out.
Superposition Diagram	

Lesson	Memorised?
1. Making Sounds	
2. Moving Sounds	
3. Detecting Sounds	
4. Using Sound	
5. Comparing Waves	

8F The Periodic Table

1. Dalton's Atomic Model

Matter	All things are made of matter.
John Dalton	(1766-1844) An English chemist.
Dalton's Atomic Theory	• all matter is made up of atoms. • atoms in an element are identical. Each element has its own type of atom. • atoms cannot be destroyed or created. • In compounds each atom is always joined to a fixed number of other atoms. • atoms rearrange during chemical reactions to form new substances.
Atoms	Small particles that all matter is made up of.
Element	A substance made up of one kind of atom.
Compound	Contains atoms of two or more different elements chemically joined together.
Physical Properties	The properties that describe a substance on its own. *(colour, strength, density, etc.)*
Physical Changes	A change in which no new substances are formed.
Symbols	Letters used to represent the elements. *e.g. C represents Carbon*

2. Chemical Properties

Chemical Properties	How a substance reacts with other substances.
Hypothesis	An idea about how something works that can be tested using experiments.
Prediction	What you think will happen in experiment and why.
Conserving Mass	The mass of the products of a reaction will be the same as the mass of the reactants.
Chemical Formulae	The combination of symbols and numbers that shows how many atoms of different element are in a particular molecule. *e.g. water is H_2O*
Ratio	Comparison of the proportion of two quantities *e.g. in water there are 2 hydrogens for every oxygen, the ratio is 2:1*

3. Mendeleev's Table

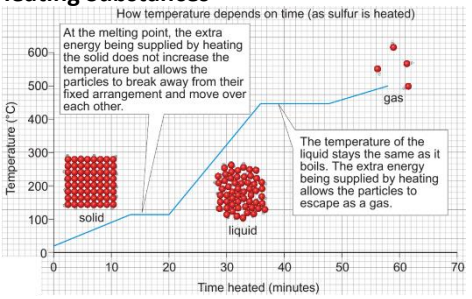
Johann Döbereiner	(1780-1849) German chemist who highlighted some groups of 3 elements had similar physical / chemical properties.
John Newlands	(1837-1898) English chemist who ordered elements by the mass of atoms and noticed every 8th element has similar properties.
Dmitri Mendeleev	(1834-1907) Russian chemist who published the first periodic table by ordering elements by increasing masses of their atoms forming groups of similar properties.
Gaps	Mendeleev left gaps in his table for undiscovered elements and predicted their properties.

Group	A vertical column in the Periodic Table- contains elements with similar properties.
Alkali Metals	Group 1 Very reactive metals, they even react with water.
Halogens	Group 7 React with most metals to form solid compounds.
Noble Gases	Group 0 Unreactive gases

4. Physical Trends

Melting Point	When a substance changes from a solid into a liquid
Boiling Point	When a substance changes from a liquid into a gas.
Freezing Point	When a substance changes from a liquid into a solid- the same as the melting point.

Heating Substances



Periods	The horizontal rows in the Periodic table.
Transition Metals	Block of elements in the middle of the Periodic table- separates the eight main groups.
Metal Properties	High melting points, strong, flexible, malleable, shiny, good conductors.
Non-Metal Properties	Low melting points, brittle, dull, poor conductors.

5. Chemical Trends

Alkali Metals & Water	Alkali metals produce metal hydroxides and hydrogen when reacting with water. *(sodium + water → sodium hydroxide + hydrogen)*
Alkali Metals & Oxygen	Alkali metals produce metal oxides when reacting with oxygen. *(lithium + oxygen → lithium oxide)*
Reactivity	How quickly / vigorously something reacts.
Alkali Metal Reactivity	As you move down the group the reactivity increases.
Oxides	Formed when elements react with oxygen.
Oxide Trends	When we dissolve oxides in water there is a trend in their pH. Further to the left of the Periodic table oxides formed are more alkaline. Further to the right they are more acidic.

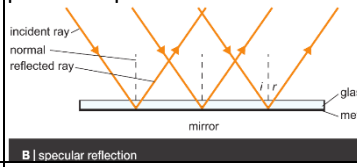
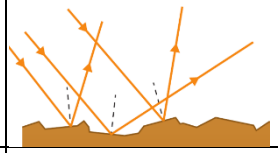
Lesson	Memorised?
1. Dalton's Atomic Model	
2. Chemical Properties	
3. Mendeleev's Table	
4. Physical Trends	
5. Chemical Trends	

8J Light

1. Light on the move

Vacuum	A completely empty space, containing no particles.
Matter	All things are made of matter. There are three states of matter: solid, liquid, gas.
Longitudinal wave	A wave where the particles vibrate in the same direction as the wave is travelling. 
Transverse wave	A wave where the vibrations are at right angles to the direction the wave is travelling. 
Ray	A narrow beam of light, or an arrow on a diagram representing the path of light and the direction in which it is travelling.
Transparent	A material that light can travel through without scattering. (Note: transparent substances may be coloured or colourless.)
Transmit	To pass through a substance.
Reflect	To bounce off a surface instead of passing through it or being absorbed.
Absorb	'To soak up' or 'to take in'.
Translucent	Material that lets light through but scatters it. You cannot see things clearly through translucent materials.
Opaque	Material that does not let light through. It is not possible to see through an opaque substance.
Scattered	Scattering occurs when light or other energy waves pass through an imperfect medium (such as air filled with particles of some sort) and are deflected from a straight path.
Reflected ray	A ray of light bouncing off a mirror.
Source	Where a sound wave or other wave begins.
Image	A picture that forms in a mirror or on a screen, or is made by a lens. You see an image when looking down a microscope.
Pinhole camera	A piece of apparatus that forms an image of an object on a screen when light rays travel through a tiny hole in the front
Shadow	A place where light cannot get to, because an opaque object is blocking the light.

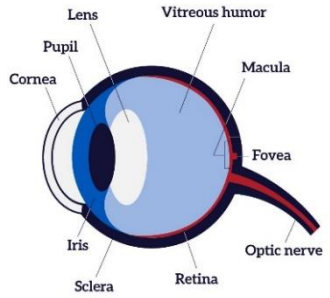
2. Reflection

Plane mirror	A smooth, flat mirror.
Ray box	A piece of equipment that produces a narrow beam of light.
Ray tracing	A method of investigating what happens to light by marking the path of a light ray.
Ray diagram	A diagram that represents the path of light using arrows.
Normal	An imaginary line at right angles to the surface of a mirror or other object where a ray of light hits it.
Incident ray	A ray of light going towards the mirror or other object.
Reflected ray	A ray of light bouncing off a mirror.
Angle of incidence	The angle between an incoming light ray and the normal.
Angle of reflection	The angle between the normal and the ray of light leaving a mirror.
Specular reflection	When light is reflected evenly, so that all reflected light goes off in the same direction. Mirrors produce specular reflection.  B | specular reflection
Diffuse reflection	Reflection from a rough surface, where the reflected light is scattered in all directions. 
Law of reflection	The angle of incidence is equal to the angle of reflection.

3. Refraction

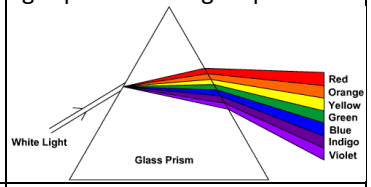
Refraction	The change in direction when light goes from one transparent material to another.
Interface	The boundary between two materials.
Lens	A curved piece of glass or other transparent material that can change the direction of rays of light.
Converging lens	A lens that makes rays of light come together.
Angle of refraction	The angle between the normal and a ray of light that has been refracted.
Focal point	The place where parallel rays of light are brought together by a converging lens.
Focal length	The distance between the centre of the lens and the focal point.

4. Cameras and eyes

Digital camera	A camera that uses electronics to record an image.
Sensor	An instrument that detects something. In a digital camera, the sensors detect light and change it to electrical signals.
Memory card	Part of a digital camera that stores the images.
Aperture	A hole in a camera that controls how much light goes to the sensor.
Shutter	A device that shields and protects the sensor in a digital camera. It opens when the picture is taken.
Human eye	

Retina	The part at the back of the eye that changes energy transferred by light into nerve impulses.
Pupil	The hole in the front of the eye that light can pass through.
Rod cell	A cell in the retina that detects low levels of light. It cannot detect different colours.
Cone cell	A cell in the retina that detects different colours of light.
Cornea	The transparent front part of the eye, which covers the iris and pupil.
Iris	The coloured part of the eye.
Optic nerve	The nerve that takes impulses from the retina to the brain.
Primary colour	One of three colours that are detected by the cone cells in our eyes. The primary colours are red, green and blue.
Secondary colour	A colour made when two primary colours mix. The secondary colours are magenta, cyan and yellow.

5. Colour	
White light	Normal daylight, or the light from light bulbs, is white light.
Frequency	The number of vibrations (or the number of waves) per second. Different frequencies of light have different colours.
Spectrum	The seven colours that make up white light.

Dispersion	The separating of the colours in light, for example when white light passes through a prism. 
Prism	A block of clear, colourless glass or plastic. Usually triangular.
Filter (physics)	Something that only lets certain colours through and absorbs the rest.

Lesson	Memorised?
1. Light on the move	
2. Reflection	
3. Refraction	
4. Cameras and eyes	
5. Colour	