



Science

7A Cells, Tissues, Organs and Systems

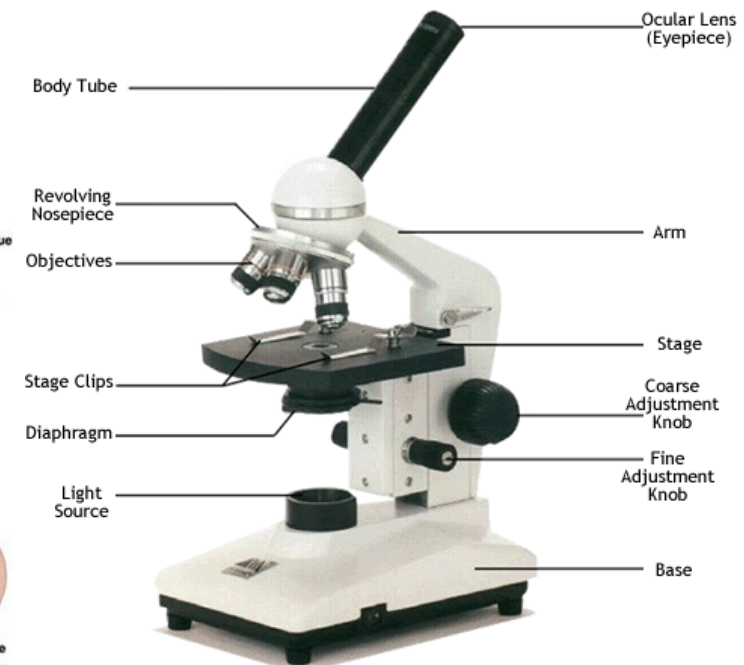
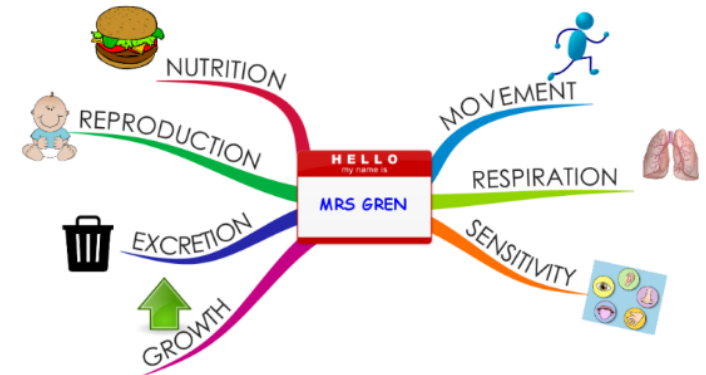
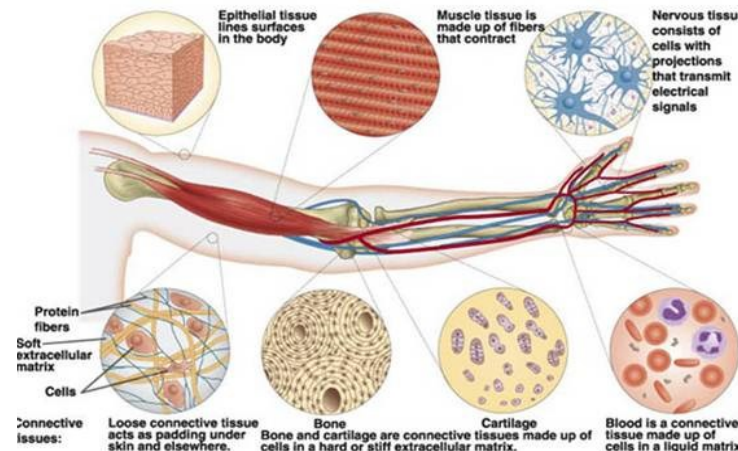
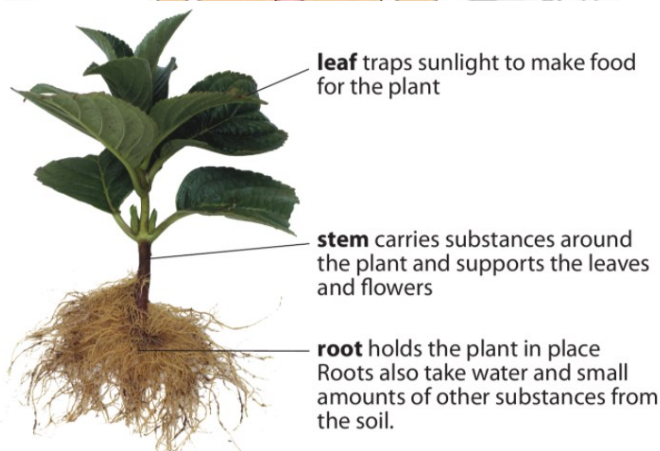
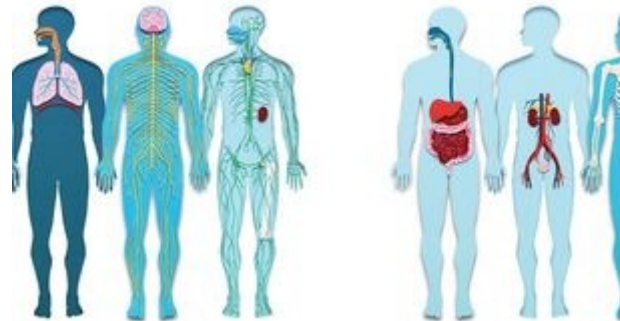
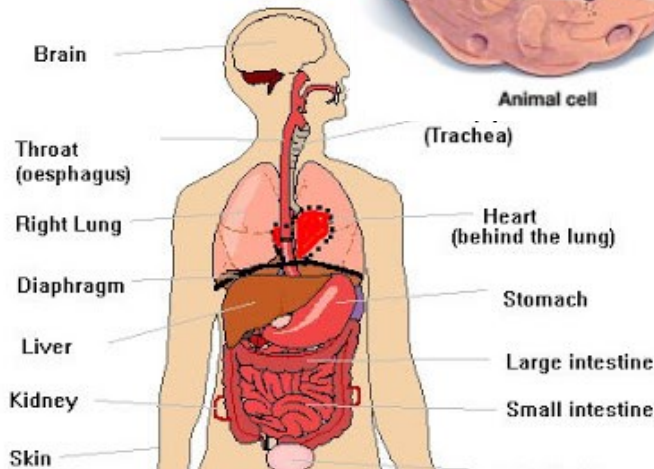
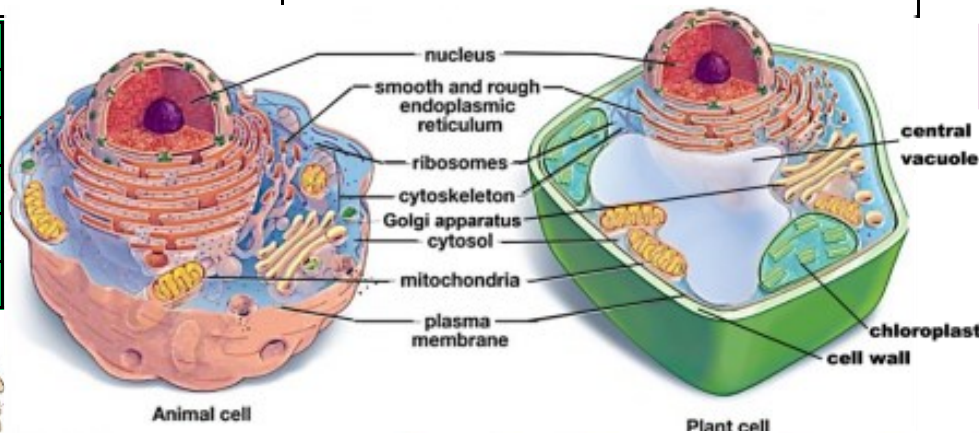
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As K Q U E S T I O N S

Th I N K Cr I Ti Ca LL Y

Lessons

1. Life Processes
2. Organs
3. Tissues
4. Cells
5. Organ Systems





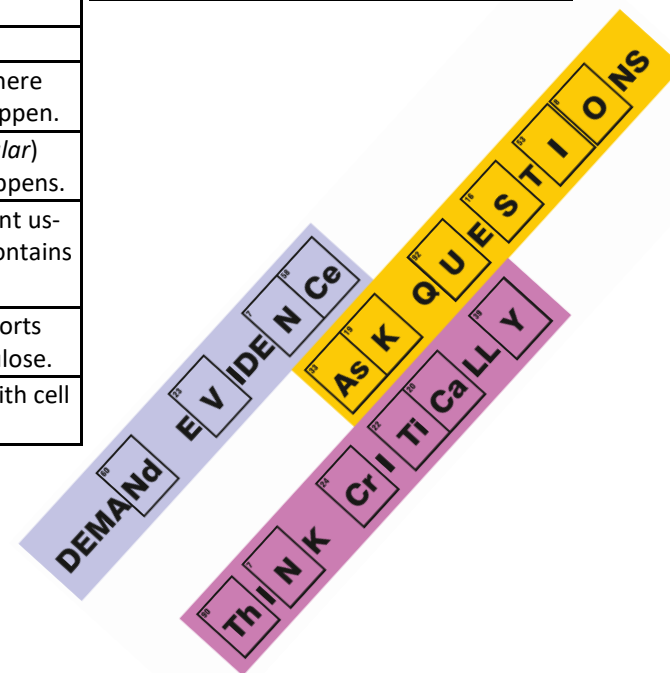
1. Life Processes	
Life Processes	If something can do all 7 life processes it is considered a 'living thing' They are; movement, reproduction, sensitivity, growth, respiration, excretion and nutrition.
Organism	A living thing.
Movement	Being able to move from place to place or move part of themselves.
Reproduction	Being able to make more living things like themselves.
Sensitivity	Being able to sense and react to things around them.
Growth	Being able to increase in size.
Respiration	Being able to release energy through respiration.
Excretion	Being able to get rid of waste materials.
Nutrition	Taking in substances (such as food) to help carry out the other processes.

2. Organs	
Organ	A part of animals or plants that does an important job - made up of different tissues.
Function	The job or role something has.
Brain	Controls the body.
Skin	The bodies biggest organ- used for protection and sensing things.
Lungs	Take in oxygen for respiration and excrete carbon dioxide.
Heart	Pumps blood around the body.
Liver	Makes and destroys substances.
Kidneys	Clean the blood and produce urine to excrete waste.
Bladder	Stores urine.
Stomach	Breaks up food.
Small Intestine	Breaks up food and absorbs it.
Large Intestine	Removes water from unwanted food.
Rectum	Stores faeces (waste material)
Leaf	Traps sunlight to make food for a plant.
Stem	Carries substances around a plant.
Root	Holds the plant in place and takes in water and other substances.
Photosynthesis	The process by which a plant makes its own food.

3. Tissues	
Tissues	Groups of the same cells doing the same job- make up organs.
The Heart	Made up of muscle tissue so it can move and pump the blood as well as fat tissue to protect it.
Root Hair Tissue	Small hairs on the outside of roots which help to take in as much water as possible.
Xylem Tissue	The tissue which carries water up through plants from the roots.

4. Cells	
Cells	The basic units from which all tissues and living things are made from.
Specialised	When something has features that allow it to do a particular job.
Cell Surface Membrane	Controls what enters and leaves the cell.
Nucleus	Controls the cell.
Cytoplasm	Jelly like substance where chemical reactions happen.
Mitochondria	(mitochondrion- singular) Where respiration happens.
Chloroplasts	Make food for the plant using photosynthesis- contains chlorophyll.
Cell Wall	Strengthens and supports the cell- made of cellulose.
Vacuole	Storage space filled with cell sap.

5. Organ Systems	
Organ Systems	A collection of organs working together.
Circulatory System	Heart, blood vessels Carries oxygen and nutrients around the body.
Digestive System	Gullet, stomach, intestines Breaks down food and takes nutrients into the blood.
Locomotor System	Muscles, bones Enables the body to move.
Urinary System	Kidneys, bladder Gets rid of waste materials produced in the body.
Breathing System	Lungs, trachea Allows exchange of gases between blood and lungs.
Nervous System	Brain, nerves, spinal cord Allows the body to sense things and react to them.
Water Transport System	Roots, stem, leaves Transports water around the plant.





Science

7H Atoms, Elements and Molecules

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ASK QUESTIONS

THINK CRITICALLY

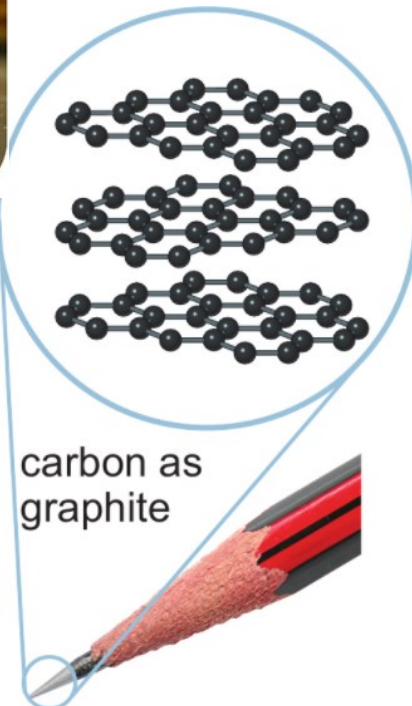
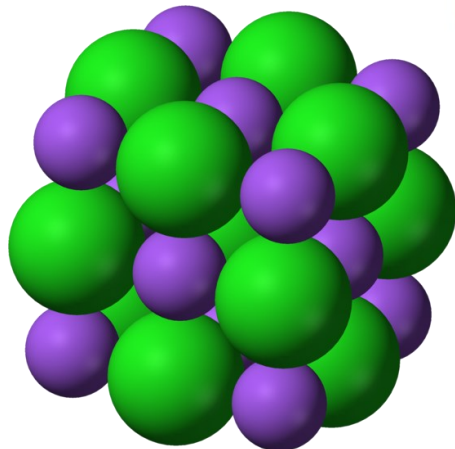
Lesson

1. The Air We Breathe
2. Earth's Elements
3. Metals and Non-Metals
4. Making Compounds
5. Chemical Reactions

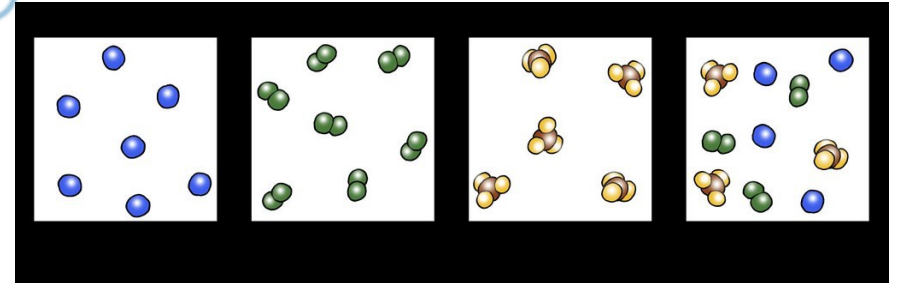
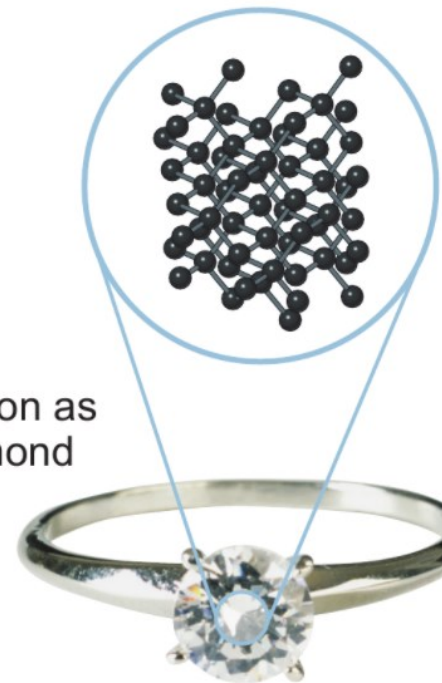
iron + sulfur → iron sulfide

reactants

product



carbon as diamond



ELEMENTS		
Hydrogen	1	Strontian
Azote	5	Barytes
Carbon	54	Iron
Oxygen	7	Zinc
Phosphorus	9	Copper
Sulphur	13	Lead
Magnesia	20	Silver
Lime	24	Gold
Soda	28	Platina
Potash	42	Mercury



1. The Air We Breathe	
Particles	Tiny pieces of matter that make up everything.
Atoms	The simplest particles of matter that make up everything.
Elements	A substance made up of one type of atom.
Molecules	Two or more atoms joined together in a group.
Compound	Two or more different atoms joined together.
Mixture	Two or more substances jumbled together but not chemically joined together.
Periodic Table	A table that lists all of the known elements.
Air	A mixture of different gases- nitrogen, oxygen, argon, carbon dioxide
Pure	A substance made up of a single element/compound and nothing else.

2. Earth's Elements	
Chemical Symbols	The 1 or 2 letters given to each element
Earth's Crust	Made up of oxygen, iron, silicon, aluminium, calcium and other elements.
Naturally Occurring Elements	Usually found as compounds, some found pure. Can be extracted from compounds by simple chemical reactions.
Properties	What an element is like, its appearance and how it behaves.
Recycling	Using a material again to save resources and make sure we don't run out.
Carbon	Can be found as diamond and graphite. The different properties of each form are due to the ways the atoms are joined together.
3. Metals and Non-Metals	
Common Metal Properties	Solid, high melting point, strong, flexible, malleable, shiny and good conductors of heat and electricity.
Metals	Three-quarters of all elements are metals- found on the left side of the periodic table.
Common Non-Metal Properties	Low melting points, brittle, not shiny and poor conductors of heat and electricity.
Malleable	Able to be beaten and bent into shape.
Flexible	Able to bend without breaking.
Conductor	A substance that allows something to pass through it (e.g. heat, electricity).

Brittle	Not easily bent- breaks under pressure.
Magnetic	Iron, nickel and cobalt are the only magnetic elements.
Mercury	The only metal that is liquid at room temperature.
4. Making Compounds	
Silicon Dioxide	The most common compound in the Earth's crust- found in sand, quartz and granite.
Forming Compounds	The first stage often involves heating a mixture of elements. Energy is often given out when elements react to form compounds.
Iron Sulfide	Compound formed by heating a mixture of iron and sulfur.
Bonds	Formed between atoms when compounds are formed.
Iron Sulfide Properties	Iron can be separated from sulfur using a magnet but iron sulfide is not magnetic.
Metal Ores	A rock containing a compound of a metal.
Naming Compounds	If one of the elements in the compound is a metal its name goes first. the non-metal at the end of the compound's name has its name changed so it ends in -ide.

5. Chemical Reactions	
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.
Thermal Decomposition	Using heat to break down a compound- used to extract metals from their compounds.
Thermal Decomposition of Mercury Oxide Mercury oxide → mercury + oxygen	
Carbonates	Compounds containing a metal, carbon and oxygen.
Calcium Carbonate	Found in limestone, chalk and marble.
Thermal Decomposition of Calcium Carbonate Copper carbonate → copper oxide + carbon dioxide	
Test for Carbon Dioxide	Carbon dioxide turns lime-water cloudy.
-ate	A compound that contains two elements plus oxygen will end in -ate. (e.g. zinc sulfate contains zinc, sulfur and oxygen)

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Science

8H Rocks

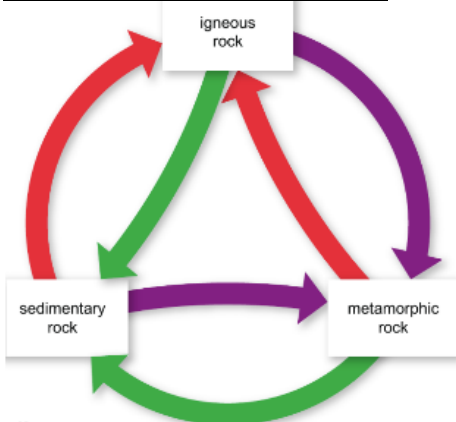
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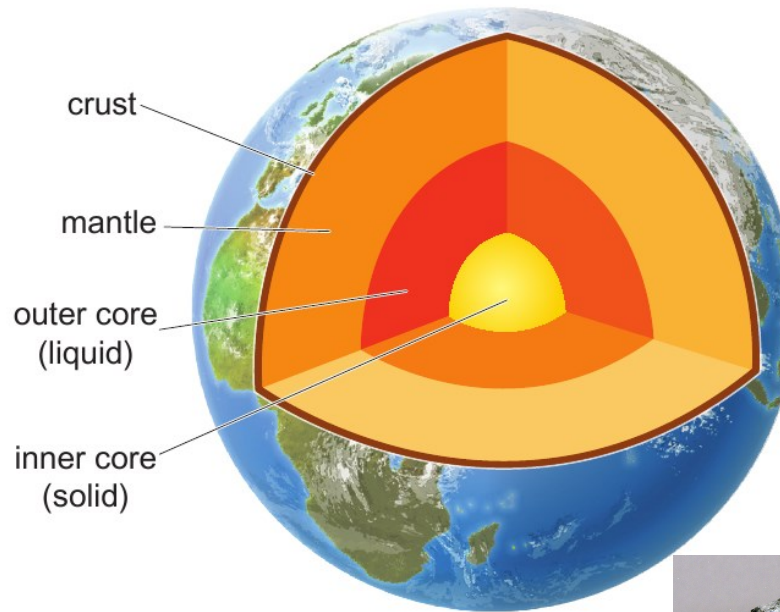
Th I N K Cr I T i Ca LL Y

Lesson

1. Rocks and their Uses
2. Igneous and Metamorphic
3. Weathering and Erosion
4. Sedimentary Rocks
5. Materials in the Earth



Key
■ increasing temperature and pressure
■ melting and cooling
■ erosion, deposition and cementation





1. Rocks and their Uses	
Geologist	A scientist who studies rocks and the Earth.
Rocks	Naturally occurring substances made up of different grains.
Grains	Made from one or more chemical compounds.
Minerals	The chemical compounds in rocks- rocks are mixtures of different minerals.
Texture	The combination of sizes and shapes of grains in a rock.
Interlocking Crystals	The grains all fit together with no gaps. They are hard and do not wear away easily.
Rounded Grains	Some rocks have rounded grains with gaps in between. They are not strong and can be worn away more easily.
Porous	Rounded grain rocks can absorb water because it gets into the gaps.
Permeable	Water can run through.
Cement	A building material made from limestone.
Gravel	A mixture of cement, sand and gravel.

2. Igneous and Metamorphic	
Igneous Rocks	Formed when molten rock cools down <i>e.g. basalt, granite</i>
Magma	Molten rock
Lava	Magma that reaches the Earth's surface.
Small Crystals	Formed when molten rock cools down fast due to less time for particles to become ordered.
Large Crystals	Formed when molten rock cools down slowly due to more time for a large grid pattern to form.
Extrusive	Igneous rocks formed from cooling lava above the surface.
Intrusive	Igneous rocks formed underground.
Metamorphic Rocks	Formed by pressure and heat changing other rocks. <i>e.g. Schist, gneiss (both formed from granite) slate (from mudstone) and marble (from limestone)</i>
Metamorphic Rock Texture	Always made from interlocking crystals which may form coloured bands.
3. Weathering and Erosion	
Weathering	When rocks are broken up by physical, chemical or biological processes.
Chemical Weathering	When rocks are broken up by chemical reactions. <i>e.g. gases in air making rain-water slightly acidic which then reacts with minerals in rock wearing them away.</i>

Biological Weathering	When rocks are broken up by living organisms. <i>e.g. growing plants splitting rocks apart with their roots.</i>
Physical Weathering	When rocks are broken up by physical processes. <i>e.g. changes in temperature causing expansion and contraction over time, cracking rocks.</i>
Expanding	Rocks get bigger when they are heated.
Contracting	Rocks get smaller when they are cooled.
Freeze-Thaw Action	Water gets into cracks in rocks, freezes, expands and then forces the crack to get bigger.
Erosion	The movement of loose and weathered rock.
Abrasion	When rock fragments bump into each other and are worn away.
Sediment	Bits of rock and sand in streams or rivers.
Glacier	Rivers of ice that move slowly but can transport large pieces of rock.

4. Sedimentary Rocks	
Sedimentary Rocks	Formed when layers of sediment build up over time followed by compaction then cementation. <i>e.g. sandstone, mudstone</i>
Compaction	Pressure forces water out from the gaps between grains squashing the grains closer together.
Cementation	Dissolved minerals between the gaps act as a glue and 'cement' the grains together.
Sedimentary Rock Texture	They are always made from rounded grains. Properties depend on the type of sediment that forms them.
5. Materials in the Earth	
Native State	Metals found as pure elements in rocks.
Ores	Rocks that contain enough of a metal / metal compound to be worth mining.
Extracting Ores	Ores are obtained by mining, then crushed and chemical reactions used to obtain the metal.
Mining Problems	Damages the environment by destroying habitats and causes pollution.
Rare Metals	Hard to obtain which makes them expensive.
Recycling	Using a material again.
Recycling Advantages	Cuts down on pollution from mining and landfill sites, allows supplies to last longer and requires less energy.

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Science 8L Earth and Space

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Lesson

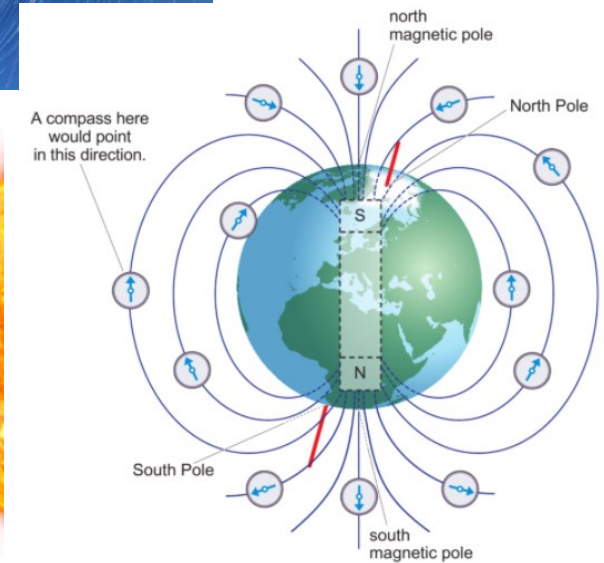
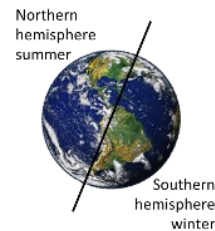
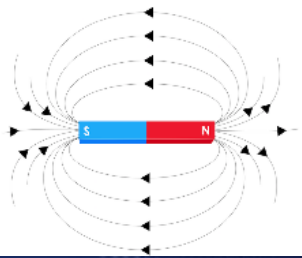
1. Gathering the Evidence

2. Seasons

3. Magnetic Earth

4. Gravity in Space

5. Beyond the Solar System





1. Gathering the Evidence	
Astronomer	A scientist that studies space.
Early Astronomers	Could only use their eyes to make observations.
Ptolemy	Egyptian astronomer (90-168) Proposed a model with the Earth in the centre and the Moon, Sun and planets orbiting the Earth.
Nicolaus Copernicus	Polish astronomer (1473-1543) Suggested the Earth and other planets move in circles around (orbit) the Sun.
Reaction to Copernicus' Model	It was not accepted straight away. However observation made by Galileo using one of the first telescopes provided more evidence to support it.
Johannes Kepler	German astronomer (1571-1630) Proposed the model used today. The Sun is at the centre with the planets moving around in elliptical orbits. Moons orbit planets.

Phases of the Moon	The Moon appears different shapes at different times due to its position relative to the Earth and Sun.
Spacecraft	Allowed scientists to investigate space more by collecting samples and taking readings on other planets.
2. Seasons	
Summer	Longer days than nights, Sun high in the sky.
Winter	Longer nights than days, Sun not very high in the sky.
Cause of Seasons	Due to the tilt of the Earth's axis by 23.5°.
Causing Summer	When the northern hemisphere is tilted towards the Sun it is summer in the UK.
Causing Winter	When the northern hemisphere is tilted away from the Sun it is winter in the UK.
Causing Seasons Diagram	
Summer Sun	Because the Sun is higher in the sky in summer the heat is more concentrated, making it feel warmer

3. Magnetic Earth	
Compass	A magnet that points north.
North-Seeking pole	The end of a bar magnet that points north- shortened to north pole.
South-Seeking pole	The end of a bar magnet that points south- shortened to south pole.
Attract	When two magnets are pulled together. Opposite poles will attract each other.
Repel	When two magnets are pushed apart. The same poles will repel each other.
Magnetic Field	The area around a magnet where it has an effect. Can be found using iron filings or a small compass.
Magnetic Field Strength	Strongest closest to each pole, the field gets weaker as you get further from the magnet.
Magnetic Field Direction	The direction of a magnetic field is always from the north pole towards the south pole.
4. Gravity in Space	
Gravity	Force exerted by all objects with mass trying to pull other objects towards it.
Bigger Mass	The bigger the mass of an object, the stronger the force it exerts.

Weight	The force of gravity pulling on you. <i>Measured in Newtons (N)</i>
Gravitational Field	The space around the Earth where gravity attracts things.
Gravitational Field Strength (g)	At the surface of the Earth it is about 10 newtons per kilogram (N/kg).
Weight Formula	Weight = mass x g
Gravity and Orbits	The force of gravity keeps the Earth in its orbit of the Sun.
Satellite	Anything that orbits a planet.
Natural Satellite	Moons are examples of natural satellites.
Artificial Satellite	Can be put into orbit around Earth for photographing / transmitting TV programs etc
5. Beyond the Solar System	
Constellation	Pattern of stars
Stars	Huge balls of gas that give out large amounts of energy. The Sun is a star.
Stars At Night	Appear less bright than the Sun because they are further away.
Galaxies	Large groups of stars.
Milky Way	The galaxy our Sun is in.
Universe	Made up by all of the millions of galaxies.
Light Year	Measurement of distance- the distance travelled by light in 1 year. Approximately ten million million kilometres.
Proxima Centauri	Nearest star to the Sun, about 4.22 light years away.

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