



Revision List

Year 9 Assessment week

All assessments include content taught previously in year 7 , 8 and 9.

Please use the knowledge organisers and the core questions to complete your revision.

Year 7 Topics

1. Forces
2. The Particle Model
3. Biological Processes

Year 8 Topics

1. How science works
2. Genetics
3. Reactivity

Year 9 Topics

4. Our Impact
5. Reproduction



Forces



What is a force?

Forces are either pushes or pulls. They can be placed into one of two categories: contact or non-contact.

- Contact forces occur when objects or particles touch
- Non-contact forces: objects don't need to touch to interact with the force

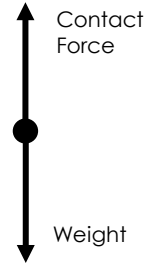
Examples of Forces

Contact	Non-Contact
<ul style="list-style-type: none"> • Friction • Air Resistance • Tension 	<ul style="list-style-type: none"> • Weight • Magnetic • Electrostatic

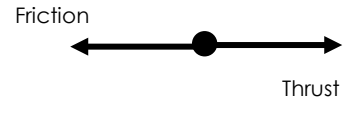
Force Diagrams

Forces always act in pairs. To represent how forces act on objects you can draw diagrams with arrows.

E.g. Book on a table



E.g. Car Driving

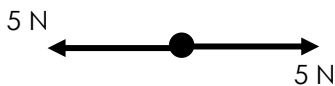


Unbalanced Forces

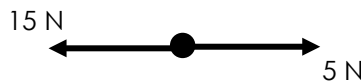
Forces are measured in Newtons, N. When one force is bigger than another, the object will experience a resultant force. If a resultant force acting on an object is bigger than 0 N it will either:

- Change its speed (e.g. accelerate or decelerate)
- Change its direction
- Change the shape of the object

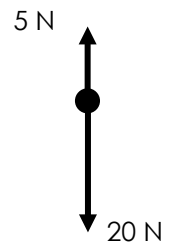
Resultant force examples:



Resultant force = 5 N - 5 N
Resultant force = 0 N



Resultant force = 15 N - 5 N
Resultant force = 10 N



Resultant force = 20 N - 5 N
Resultant force = 15 N

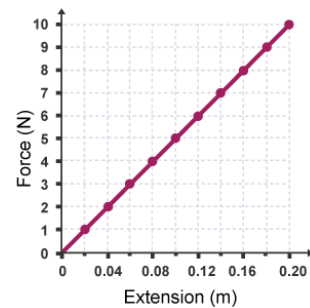
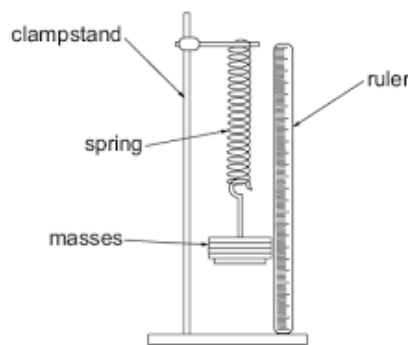
Investigating Springs

When you apply a force to a spring, the spring will stretch. The amount it stretches by is known as the **extension**.

How to measure extension:

Original Spring length = 2 cm
Stretched spring length = 8 cm
Extension = 8 cm - 2 cm
Extension = 6 cm

With all elastic objects, the extension of the object is directly proportional to the force being applied.



When you double the force, you double the extension

Work Done

When a force is applied to an object, energy will be transferred. This is known as doing work.

You can calculate the force being applied if you know the work being done and the distance.

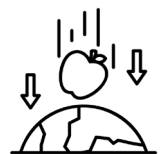
Force Applied = Work Done x Distance

(N) (J) (m)



Weight

Objects with mass are pulled downwards to earth due to gravity. This downwards force is known as your weight.



Weight can change in different gravities. For example you are six times lighter on the moon and you have no weight in space.

Weight = Mass x Gravitational Field Strength
(N) (Kg) (N/Kg)



CORE Questions



The following are core questions for this topic. Cover the answer section with a sheet of paper and try and quiz yourself. Only try learning 5 at a time, once you know them move on.

1	Give two examples of contact forces.	Any two from: friction, air resistance, tension
2	Give two examples of non-contact forces.	Any two from: magnetic, electrostatic and weight
3	True or False. Forces are push or pulls which always act in pairs.	True.
4	Which forces always acts in a downwards direction?	Weight
5	Name a force which resists the movement of an object.	Friction or a drag force.
6	State three ways a force can affect an object if the forces are unbalanced.	Change its speed, direction and shape
7	State the unit forces are measured in.	Newtons, N
8	A car drives with a force of 80N and the friction is 30N. Calculate the resultant force.	$80 - 30 = 50\text{N}$
9	A skydiver is falling with a weight of 100N at a constant speed. Suggest the value of the air resistance force.	100N. Since the speed is constant they must be balanced.
10	The force applied to a spring is directly proportional to the extension. Suggest what would happen to the extension of the spring if the force doubles.	The springs extension would double as well
11	When you collect data which could take any value. Should it be plotted on a line graph or a bar chart?	Line graph
12	State the unit for measuring weight.	Newtons, N
13	State the unit for measuring mass.	Kilograms, Kg
14	Put into an equation: weight, mass and gravity	Weight = Mass x Gravity
15	A man with a mass of 50Kg is on a planet with a gravitational field strength of 5N/Kg. Calculate his weight.	$W = m \times g$ $W = 50 \times 5$ $W = 250\text{N}$
16	What is the name of the downwards force that pulls you towards earth?	Weight
17	State the units for measuring work done.	Joules, J
18	True or False. Work done means force transferred.	False. It means energy transferred.
19	Put into an equation: work done, force and distance.	Work Done = Force x Distance
20	A crane lifts a crate 100m into the air with a force of 10N. Calculate the work done to lift it.	$w = f \times d$ $w = 10 \times 100$ $w = 1000\text{J}$



The Particle Model



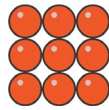
Physical Changes

This refers to a change in state. For example, when a solid melts into a liquid.

Ice melting into water is a physical change because it can be reversed.



States of Matter



Solids: regular pattern, with all particles touching. Particles **vibrate** in their position.



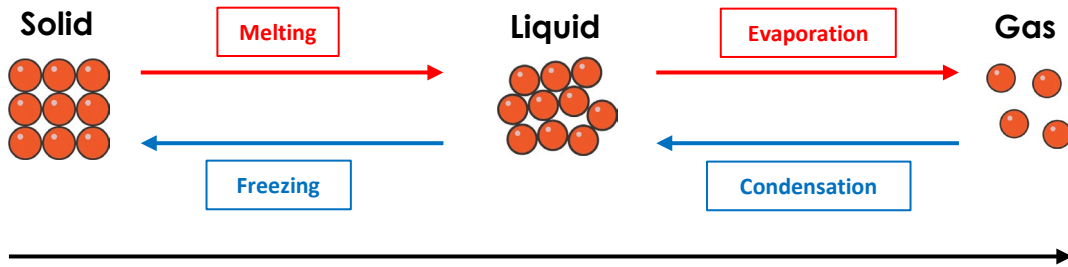
Liquids: irregular pattern, with all particles touching. Particles are touching and **can flow** around each other.



Gases: random pattern, with all particles spaced out. They **can be compressed**. Particles move at different speeds in different directions.

Changes of State

A change of state is where particles will **change their state of matter**. For example, when a solid turns to a liquid, this is called melting. The diagram below shows all the different processes:



When you increase the temperature of a substance, the particles will **gain more kinetic energy**. This means they move faster. Gases have more kinetic energy than solids.

Density

This is the amount of mass per volume. Very dense objects have lots of mass in a small volume.

- Solids are more dense than liquids and gases
- Liquids are more dense than gases

You can use an equation to calculate an objects density. You need to divide the objects mass by its volume.

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Melting and Boiling Points

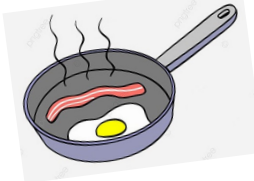
Every substance has its own temperature at which it melts or boils.

- Melting Point – point at which a substance turns from a solid to a liquid
- Boiling Point – point at which a substance turns from a liquid to a gas

For example, water has a melting point of 0 °C and a boiling point of 100 °C.

Conductors and Insulators

Some materials transfer heat faster than others. Materials which are **good at transferring heat** are called **conductors**.



Materials which are **bad at transferring heat** are called **insulators**. Conduction is the transfer of heat through solids.

Examples of Materials	
Conductors	Insulators
• Metals	• Plastic

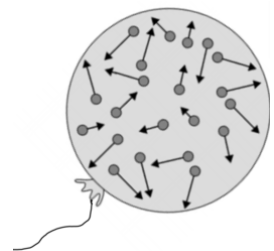
Motion of Gases

Gas particles move at different speeds in different directions.

Gas particles get more kinetic energy if you heat them up, making them move faster.

Gas pressure is created by:

- Gas particles hit the wall of the container
- This creates a force on the wall





CORE Questions



The following are core questions for this topic. Cover the answer section with a sheet of paper and try and quiz yourself. Only try learning 5 at a time, once you know them move on.

1	What is the change of state called when a solid turns into a liquid?	Melting
2	What is the change of state called when a liquid turns into a gas?	Evaporation/Boiling
3	What is the change of state called when a liquid turns into a solid?	Freezing
4	What is the change of state called when a gas turns into a liquid?	Condensation
5	What is a melting point?	The temperature a solid turns to a liquid
6	What is a boiling point?	The temperature a liquid turns to a gas
7	What is the melting point of water?	0 degrees celsius
8	What is the boiling point of water?	100 degrees celsius
9	Which state of matter is the most dense?	Solid
10	Which state of matter is the least dense?	Gas
11	Put into an equation: density, mass, volume	Density = mass / volume
12	Calculate the density of a block with a mass of 10Kg and a volume of 2m ³	$10/2 = 5\text{Kg/m}^3$
13	How do gas particles move?	At different speeds in different directions.
14	True or False. Gases always exert pressure on the walls of their containers.	True.
15	How does gas pressure occur?	Gas particles hit the walls of their containers creating a force.
16	What is a vacuum?	A space with no particles.
17	Define conduction.	The transfer of heat through solids
18	Why are solids better conductors of heat than liquids?	The particles are closer together.
19	Is metal a good conductor or insulator?	Conductor
20	Is plastic a good conductor or insulator?	Insulator



Biological Processes



Digestion of Nutrients

Proteins, carbohydrates and fats need to be broken down and digested so the nutrients can be absorbed into the blood stream.

Your pancreas releases digestive juices containing **enzymes**.

Enzymes help speed up the digestion of your food in your digestive system.

They are biological catalysts.



Respiration

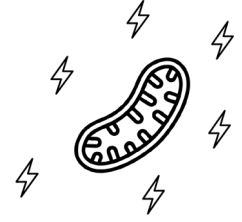
All living things need to do a reaction called respiration in their cells. This releases energy so that the organism can:

- Growth or repair cells
- Move
- Keep warm

Respiration takes place in the mitochondria of cells.

There are two types of respiration:

- Aerobic respiration
- Anaerobic respiration



Aerobic Respiration

This is respiration that requires oxygen. You respire to release energy.



You breathe this in.

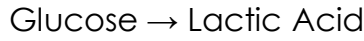
You get from digesting food

You breathe this out

Anaerobic Respiration

This is respiration that does not require oxygen. It is used for a quick burst of energy.

This comes from the glucose stored in your muscles

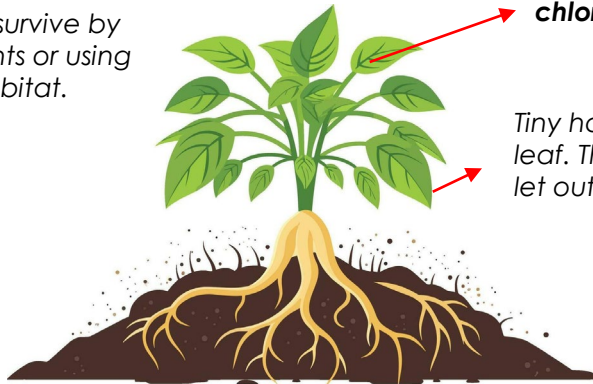


A large build up of this causes muscle cramp, so anaerobic respiration can only be temporary

The Importance of Plants

Without plants there would be no animal life! Plants are known as producers, they produce glucose using sunlight in a reaction called photosynthesis. Photosynthesis takes in CO₂ from the atmosphere and releases O₂.

Lots of animals survive by feeding on plants or using them in their habitat.



Leaves have a pigment called **chlorophyll** which traps sunlight

Tiny holes called **stomata** cover each leaf. This allows them to let in CO₂ and let out O₂.

O₂ is needed for all living things to do respiration

Photosynthesis

This reaction is done in the leaves of plants. There must be light for it to happen.



Absorbed from the atmosphere

Absorbed by the roots from soil

Released to the atmosphere

Used for growth of the plant and respiration



CORE Questions



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1	State what is found in digestive juices.	Enzymes
2	What is the function of a digestive enzyme?	To help break down large food molecules into smaller molecules
3	True or False. Enzymes are known as biological catalysts.	True.
4	State the word equation for aerobic respiration.	Glucose + Oxygen → Carbon Dioxide + Water
5	State the reactants for aerobic respiration.	Glucose + Oxygen
6	State the products for aerobic respiration.	Carbon Dioxide + Water
7	Why does your breathing rate increase when you do more exercise?	To increase the amount of oxygen for aerobic respiration.
8	What is the difference aerobic respiration and anaerobic respiration?	Anaerobic does not require oxygen and produces lactic acid
9	Why is the build up of lactic acid a problem?	It creates muscle cramps
10	Why is anaerobic respiration in yeast used in the manufacture of alcohol?	It produces ethanol
11	State the word equation for photosynthesis	Carbon Dioxide + Water → Oxygen + Glucose
12	What energy is required for photosynthesis to occur?	Light
13	State the reactants for photosynthesis reaction	Carbon Dioxide + Water
14	State the products for photosynthesis reaction	Oxygen + Glucose
15	Name the green pigment in leaves that traps sunlight	Chlorophyll
16	Why are leaves covered in tiny holes called stomata?	To allow CO ₂ to diffuse in and O ₂ to diffuse out
17	Why are plants important for our atmosphere?	They take in CO ₂ and give out O ₂ . CO ₂ is a greenhouse gas.
18	Why are plants known as producers?	They produce their own food by photosynthesis
19	Why are plants important to ecosystems?	Organisms feed off plants
20	What sugar do plants produce by photosynthesis?	Glucose



How Science Works...



Resolution

The resolution is the smallest possible change on the measuring device.

Look at the examples. The more decimal place, the higher the resolution.

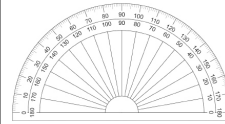


1 °C



Stopclock

0.01 s



Protactor

1 °



0.01 A

Accuracy

Accurate results must be as close as possible to the true value.

For example:

Imagine two students measured the time it takes for someone to run 10m.

The true time was 9.8 seconds

- Student A said the time was 10.1 seconds
- Student B said the time was 9.1 seconds.
- Student A is closer to the true value, making it more accurate.

To make experiments more accurate you should:

- Repeat the experiment 3 times
- Calculate a mean

Precision

Results which are precise are close together.

Look at student A and student B's temperature readings in 3 experiments.

- Student A: 20 °C, 21 °C, 19 °C
- Student B: 20 °C, 24 °C, 18 °C

Student A's results are more precise as they are closer together

Variables

In experiments, you need to make sure you plan your three variables so the results are valid:

- **Independent** Variable – the variable being made **different**
- **Dependent** Variable – the variable being **measured, counted or recorded**
- **Control** Variable – the variable being kept the **same**

Understanding Line Graphs

When your experiment has continuous data with numbers your need to draw a line graph.

Use the table to plot the line graph. Then draw a line of best fit with a ruler.

The right column tells us what goes on the x axis

The left column tells us what goes on the y axis

The right column also tells you the independent variable

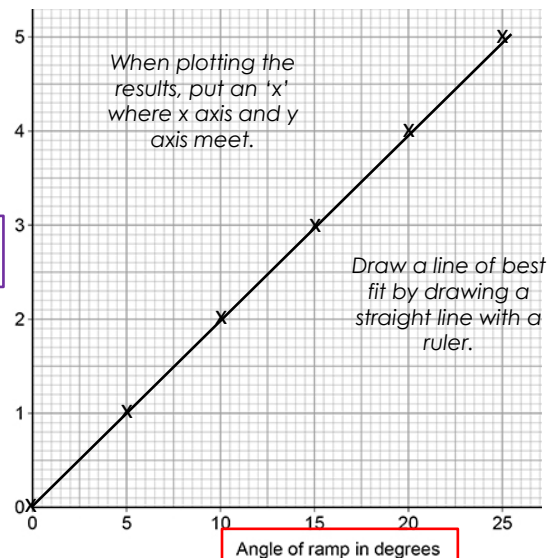
This is what you change in the experiment

Angle of ramp in degrees	Force in newtons
0	0
5	1
10	2
15	3
20	4
25	5

The left column also tells you the dependent variable

This is what you measure in the experiment

Force in newtons





CORE Questions



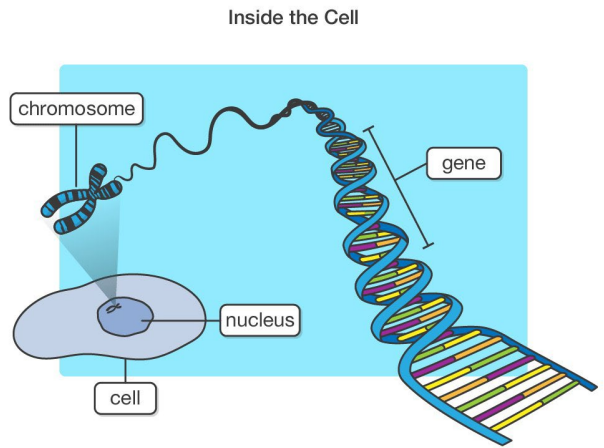
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1	A stopwatch reads 52.3s. What is the resolution of the stopwatch?	0.1 s
2	True or false. Precise is when the results are close together	True
3	Why should you repeat an experiment at least 3 times?	
4	True or false. Accuracy is when results are close to the true value.	
5	Which variable is different in an experiment?	
6	Which Variable is measured, recorded or counted during an experiment?	
7	Which value stays the same every time you do the experiment?	
8	Why do you need to ensure all three variables are needed in your experiment?	
9	Which column title goes on the X-axis?	
10	Which column title goes on the Y-axis?	
11	What type of graph/chart is drawn for discontinuous data?	
12	Which type of graph/chart is drawn for continuous data?	
13	Which variable is the represented in the left-hand column of your table?	
14	Which variable is represented by the right-hand column of your table?	
15		
16		

Genetics & Inheritance

How Genetic Information is Stored

- Our cells contain a nucleus
- DNA is found in the nucleus
- **DNA** has a **double helix** structure which repeats (this is why it can be called a polymer)
- DNA is wrapped up into structures called **chromosomes**.
- In a normal human cell, each nucleus contains 23 pairs of chromosomes (46 in total).
- In a sex cell (e.g. sperm or egg), each nucleus only contains 23 chromosomes.
- A section of a chromosome is known as a **gene**
- Genes have information about your characteristics. E.g. you will have a gene that determines your eye colour



Inheriting Chromosomes

- A **normal** cell contains **23 pairs**
- **Sex** cells contain **23**
- **Females** have an **XX** pair
- **Males** have an **XY** pair
- Your chromosomes are **inherited** from your biological mother and father



Variation

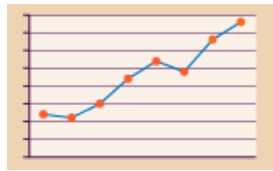
- All living things have differences between them, this is called variation.
- There are two types of variation: **inherited** and **environmental**
- However some characteristics can be a mixture of both.

Examples of Variation		
Inherited	Environmental	Both
Eye Colour	Scars	Weight
Skin Colour	Tattoos	Height

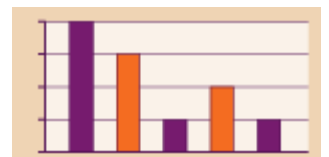
Choosing the Right Graph for your Data

- Data collected from experiments can either be described as categoric or continuous.
- Data which could be any numbers are considered to be continuous. You have to **measure continuous data**. E.g. measuring the height or weight of the people in your class
- Data which needs to be put into categories is known as categoric (or discrete data). You have to **count categoric data**. E.g. counting the number of people in your class with blue or brown eyes.

Continuous Data should be on a line graph



Categoric Data should be on a bar chart



Competition

All organisms need to compete for resources.

Animals compete for:

Food, water, space, mates

Plants compete for:

Light, water, space, minerals

Adaptations make organisms better suited for competition. This **increases** their chance of **surviving** and **reproducing**

Evolution by Natural Selection

Charles Darwin's theory of natural selection explains how animals have evolved from simple life forms.



- **Mutated** DNA causes a change
- **Variation** between organisms
- **Advantage** against other organisms
- **Survives** when competing
- **Reproduction** becomes more likely
- **Genes** are passed on to offspring

You can remember this using:
My Very Annoying Sister Ruins Games

Extinction

This is when there are no remaining organisms of a species left.

- Extinction is caused by:
- Destruction of habitat
 - New diseases
 - New predators
 - Changes to the environment





CORE Questions



The following are core questions for this topic. Cover the answer section with a sheet of paper and try and quiz yourself. Only try learning 5 at a time, once you know them move on.

1	True or False. Genetic information is passed on through a chemical called DNA.	True.
2	Where is DNA found?	Nucleus
3	Put the following in order from smallest to largest. Gene, Nucleus, DNA, Chromosome.	DNA > Gene > Chromosome > Nucleus
4	True or False. DNA can be describe as a polymer made up of two strands forming a double helix.	True.
5	Small sections of DNA on a chromosome which carry information are called what?	Genes
6	DNA wrapped up as a long strand is known as what?	Chromosome.
7	Where are chromosomes found?	In the nucleus.
8	How many chromosomes would you find in an ordinary human body cell?	46
9	How many chromosomes would you find in a sex cell?	23
10	One pair of chrmosomes in humans determines sex. What is the chromosomes for females?	XX
11	One pair of chrmosomes in humans determines sex. What is the chromosomes for males?	XY
12	How is genetic information inherited?	You get 23 chromosomes from your biological mother and father
13	State two different types of variation.	Inherited and environmental
14	Give 2 examples of inherited variation	Eye colour, skin colour, blood group, genetic disease
15	Give 2 examples of environmental variation	Scars, tatoos, piercings
16	Give 2 examples of variation which could be considered both environmental and inherited.	Weight and height
17	Give an example of continuous data	Height, weight
18	Give an example of discontinuous data	Blood type, hair colour, eye colour
19	Identify four things animals compete for.	Food, water, space, mates
20	Identify four things plants compete for.	Light, water, space, minerals
21	How do adaptations an animals chance of survival?	They are better suited to compete against other organisms
22	True or False. Adaptations make animals more successful at competing, therefore they find it easier to survive and reproduce.	True.
23	What happens to DNA when it is mutated?	DNA changes
24	True or False. Variation caused by a change in DNA which leads to adaptions makes organisms more likely to survive.	True.
25	Who discovered evolution by natural selection?	Charles Darwin
26	If a mutation in DNA causes an animal to have an advantage, what is it more likely to do?	Survive and reproduce
27	How does evolution occur?	The process of natural selection.
28	Identify two factors which can lead organisms to become extinct.	Any from: changes to the environment, destruction of habitat, new disease, new predators
29	How can we prevent organisms becoming extinct?	Create genebanks or put animals on endangered species list
30	Suggest why certain species of monkeys become extinct when forests are cut down.	There habitat is destroyed (and they can no longer compete for food and water).

Reactivity in Chemistry

State Symbols

Chemists like to use chemical formula as it is quick to write. E.g. H₂O instead of water. State symbols tell us the **state of matter** the substance is in when you write the formula.

Examples of sodium chloride (NaCl):

- NaCl (**s**) – solid
- NaCl (**l**) – liquid
- NaCl (**g**) – gas
- NaCl (**aq**) – dissolved in water

Naming Salts

Acid Name	Salt Created
Hydrochloric Acid	Chloride
Sulfuric Acid	Sulfate
Nitric Acid	Nitrate

The acid used in a reaction will allow you to name the salt created.

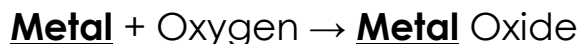
E.g. Magnesium chloride is made from reacting magnesium with hydrochloric acid

Reacting Metals with Oxygen

When you react a metal with oxygen you will produce a metal oxide.

Examples:

- Iron + Oxygen → Iron Oxide
- Calcium + Oxygen → Calcium Oxide
- Zinc + Oxygen → Zinc Oxide
- Lithium + Oxygen → Lithium Oxide



Reacting Metals with Water

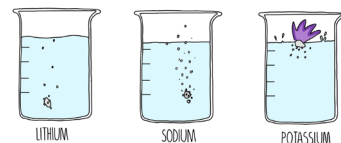
When a metal reacts with water it will produce a metal hydroxide and hydrogen gas.

Examples:

- Lithium + Water → Lithium Hydroxide + Hydrogen
- Calcium + Water → Calcium Hydroxide + Hydrogen



Alkali Metals react vigorously with water

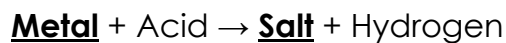


Reacting Metals with Acid

When a metal reacts with acid it will produce a salt and hydrogen gas. The name of the salt depends on the acid used.

Examples:

- Iron + **Hydrochloric** Acid → Iron **Chloride** + Hydrogen
- Iron + **Sulfuric** Acid → Iron **Sulfate** + Hydrogen
- Iron + **Nitric** Acid → Iron **Nitrate** + Hydrogen



More reactive metals will produce hydrogen gas at a faster rate

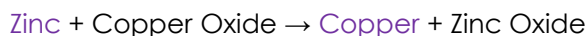
Reactivity Series & Displacement Reactions

Some metals are more reactive than others. This means they react quicker.

Metal	Reactivity Decreases ↓
Potassium	
Magnesium	
Zinc	
Iron	
Copper	
Gold	

In chemical reactions, the **more reactive** metal will **displace** the **less reactive metal**.

Look at the example below:



Zinc is more reactive than Copper
This means they will swap places

Measuring the Reactivity of Metals

To investigate the reactivity of metals you can add them to acid and measure the amount of hydrogen gas produced per second.

• Independent Variable:

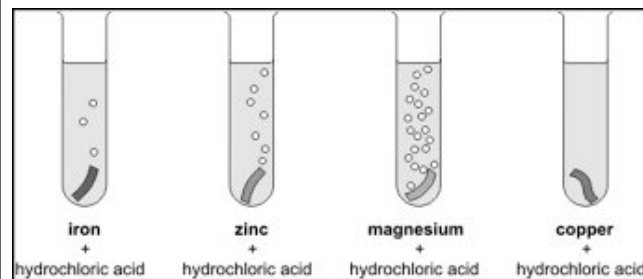
The type of metal used

• Dependent Variable:

Hydrogen gas produced per second

• Control Variable:

Same mass of metal. Same concentration of acid.





CORE Questions



The following are core questions for this topic. Cover the answer section with a sheet of paper and try and quiz yourself. Only try learning 5 at a time, once you know them move on.

1	What state is MgO (s) in?	Solid
2	What state is H ₂ (g) in?	Gas
3	What does NaCl (aq) tell us about the substance?	It is dissolved in water
4	Which metal is more reactive magnesium or copper?	Magnesium
5	Finish the word equation: Copper + Hydrochloric Acid ->	Copper Chloride + Hydrogen
6	Finish the word equation: Magnesium + Hydrochloric Acid ->	Magnesium Chloride + Hydrogen
7	When a metal reacts with an acid, what gas is released?	Hydrogen
8	Finish the word equation: Magnesium + Oxygen -> _____	Magnesium Oxide
9	Finish the word equation: Magnesium + Water -> _____ + _____	Magnesium Hydroxide + Hydrogen
10	Name the gas produced when a metal reacts with water.	Hydrogen
11	Explain why gold can not be used to displace iron from iron oxide.	Gold is lower on the reactivity series than iron.
12	Finish the equation: Magnesium + Copper Oxide -> _____ + _____	Copper + Magnesium Oxide
13	Which metal is more reactive, potassium or copper?	Potassium
14	Finish the word equation: Magnesium + Iron Oxide -> _____ + _____	Iron + Magnesium Oxide
15	Why can't gold be used to extract iron from iron oxide?	Iron is higher in the reactivity series than gold
16	When reacting metals with acids. How can you tell one metal is more reactive than another?	It releases more hydrogen gas bubbles per second
17	When testing which metal is the most reactive in acid. What is the independent variable?	The type of metal
18	When testing which metal is the most reactive in acid. Suggest two control variables.	Same mass of metal. Same concentration of acid



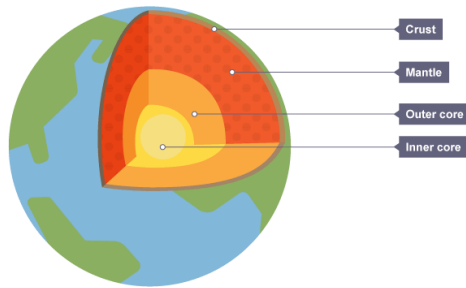
Our Impact on Earth



The Earth & Atmosphere

The Earth is surrounded by a layer of gas called the atmosphere. The atmosphere is:

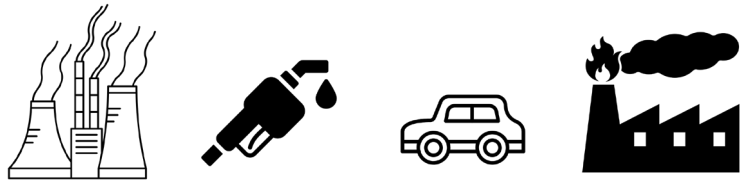
- Approximately 80% nitrogen
- Approximately 20% oxygen
- Approximately 0.04% carbon dioxide



Burning Fuels

Combustion reactions are very common. They burn fuels to release energy.

For example, cars burning petrol. However, this releases carbon dioxide which is a greenhouse gas.



Mining

Resources such as metal ores, fossil fuels or gems like diamonds need to be extracted from the earth's crust.

Mining has an environmental impact on the area around the mine leading to a destruction in habitats.

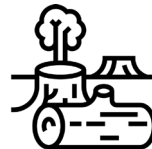


Deforestation

Forests are cut down to make space for farms and wood.

Trees absorb CO₂. So if there are less trees, there is less CO₂ absorbed.

Cutting down forests also destroys habitats and leads to more flooding.



Air Pollution

Sometimes fuels which are burnt are impure. This leads to different gases getting into the air which are harmful.

Harmful gases:
 NO₂ – Respiratory problems
 SO₂ – Acid Rain
 CO – Toxic



The Plastic Problem

Plastic pollution is one of the main environmental problems we face. Plastic takes a long time to break down, due to littering and landfill it is found everywhere.

We should reduce our dependence on plastic and try to find alternatives to improve our environments.



Recycling

Most of the materials we use are finite. This means they will run out eventually. For example, metals from can drinking cans or your smartphones.

Used metals should be recycled and reused so that we don't need to extract them from Earth.

Recycling also uses much less energy than extracting resources from the Earth and doesn't involve habitat destruction, that is why recycling technology is so important.



Carbon Footprint

This is a measure of how much CO₂ you release to the atmosphere.

You can reduce your carbon footprint by:

- Walking more
- Recycling
- Not leaving electronics on standby



Conservation of Ecosystems

Healthy ecosystems need to have stable populations of organisms. Scientists have the following methods to help maintain ecosystems:

- Breeding programmes in zoos
- Reduce climate change
- Scientific research
- Government laws
- Nature preserves
- Seed banks





CORE Questions



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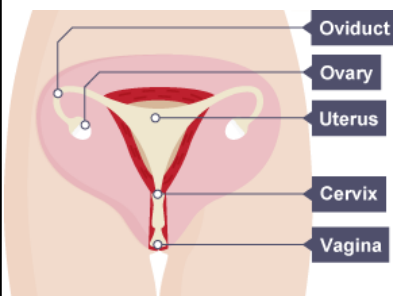
1	Approximately what percentage of the air is nitrogen?	80%
2	Approximately what percentage of the air is oxygen?	20%
3	Which gas makes up approximately 0.04% of the atmosphere?	Carbon Dioxide
4	Which gas released by combustion is a greenhouse gas?	Carbon Dioxide
5	Complete the word equation Fuel + Oxygen ->	Carbon Dioxide + Water
6	Give two examples of resources which need to be mined.	Any from metal ores, diamonds, fossil fuels
7	Give two environmental impacts of deforestation.	Destroys habitats, more floods, less CO ₂ absorbed
8	How do forests remove greenhouse gases?	They absorb CO ₂ from the atmosphere to do photosynthesis
9	Nitrous oxides are harmful gases. Suggest a problem caused by NO ₂	Respiratory problems
10	Sulphur dioxide is a harm gas. Suggest a problem caused by SO ₂	Acid Rain
11	Why is carbon monoxide (CO) a dangerous gas?	It is posionous (it can suffocate you)
12	Why is plastic a problem when people leave it in landfills or litter?	It takes a long time to break down
13	Why should metals be recycled?	They are finite (eventually run out)
14	Give two benefits of recycling.	No habitat destruction from mining, uses less energy
15	What is meant by carbon footprint?	A measure of how much CO you produce based on your activities
16	Suggest two things you can do to reduce your carbon footprint.	Walk more, recycle, don't leave electronics on standbye
17	Give two ways scientists can maintain stable ecosystems.	Breeding programes, seed banks, nature preserves



Sexual Reproduction



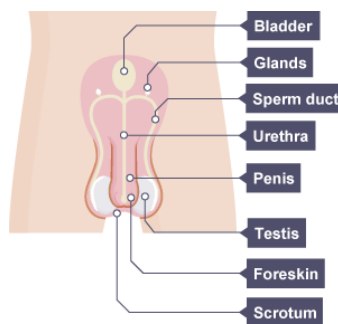
Female Reproductive Organs



The function of the female reproductive system is to:

1. Produce and release eggs from the ovaries and into the oviduct
2. To produce female sex hormones that control the menstrual cycle

Male Reproductive Organs



The function of the male reproductive system is to produce sperm cells - male gametes - and release them inside a female.

The Menstrual Cycle

- The menstrual cycle is an approximately 28 day cycle that prepares the female body for pregnancy.
- Hormone levels change during the cycle.

Day	Event
1	Bleeding from the vagina begins. This is caused by the loss of the lining of the uterus. This is called menstruation or having a period.
5	Blood loss stops. The lining of the uterus begins to re-grow and an egg starts to mature in one of the ovaries.
14	Ovulation occurs. The egg travels through the oviduct towards the uterus.
28	If the egg does not join with a sperm cell in the oviduct, the lining of the uterus begins to break down again and the cycle repeats.

Gametes and Fertilisation

Gametes are the male and female sex cells:

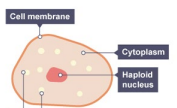
- egg cells are the female gametes and are produced by the ovaries
- sperm cells are the male gametes and are produced by the testes

Gametes have half the number of chromosomes. They have 23 chromosomes. Body cells have 46 chromosomes.

Gametes have adaptations: .



long tail to swim to the egg and lots of mitochondria to swim

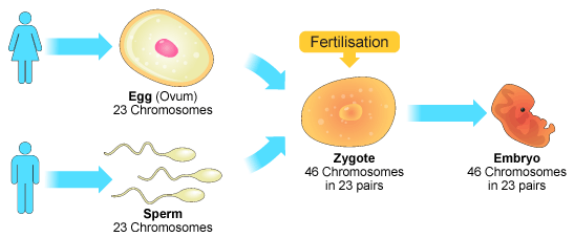


- The cytoplasm has nutrients
- The egg cell changes after fertilization so no more sperm can enter

Fertilisation

Fertilisation occurs when a nucleus of a sperm fuses with the nucleus of an egg cell to produce a fertilized egg.

The fertilized egg then matures into an embryo and implants onto the uterus lining



Contraception

Hormonal Contraception:

The oral contraceptive, which is known as the pill, contains hormones. These hormones in the pill either stop the egg from maturing or stop the release from the egg from the ovaries. Therefore, fertilisation cannot take place.

Advantages:

- more than 99% effective if taken correctly

Disadvantages:

- side effects
- Don't protect against STI's



Non Hormonal Contraception:

Condoms are a physical barrier method, which prevent the sperm from reaching an egg. Therefore, they prevent fertilisation

Advantages:

- Protect against STI's
- No side effects
- Quick and easy to use

Disadvantages:

- They can easily rip/tear

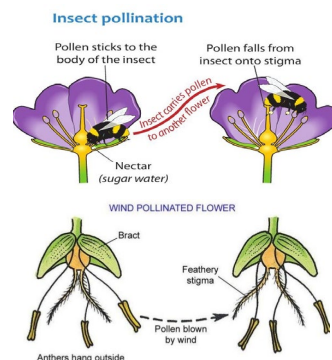


The fertilized egg then matures into an embryo and implants onto the uterus lining

Pollination

The pollen must fertilise the ovule (egg)

For this to happen the pollen from the anther needs to transfer to the stigma where it travels down to fertilise the ovule. This can occur by insect pollination or wind pollination





Core Knowledge Reproduction



The following are core questions for this topic. Cover the answer section with a sheet of paper and try and quiz yourself. Only try learning 5 at a time, once you know them move on.

1	Where is the male sex hormone produced? Where is the female sex hormone produced?	The testes The ovaries
2	What are the female sex hormones	Oestrogen and progesterone
3	What is the male sex hormone	Testosterone
4	How many days does the menstrual cycle last for?	28 days
5	What controls the menstrual cycle?	hormones
6	How many chromosomes are found in body cells?	46
7	State the male sex cell	The sperm cell
8	State the female sex cell	The egg cell
9	How is the sperm cell adapted for its function?	They have a tail to swim to the egg and lots of mitochondria to release energy to swim to the egg cell
10	How do eggs cells travel down the oviducts towards the uterus?	They are moved by tiny hairs called cilia
11	Where are the sperm cells produced?	In the testes
12	Define the term fertilisation	When the sperm and egg cell fuse together
13	Where do the egg cells mature?	ovaries
14	Where do the sperm and egg cells fuse?	Oviducts
15	What method of contraception is a condom?	Barrier method
16	How do condoms work?	They stop the sperm from entering the vagina
17	What is the contraceptive pill?	A tablet that is taken orally
18	What does the contraceptive pill contain?	Hormones that prevent ovulation
19	What is a gamete?	A sex cell
20	How many chromosomes do gametes have?	23