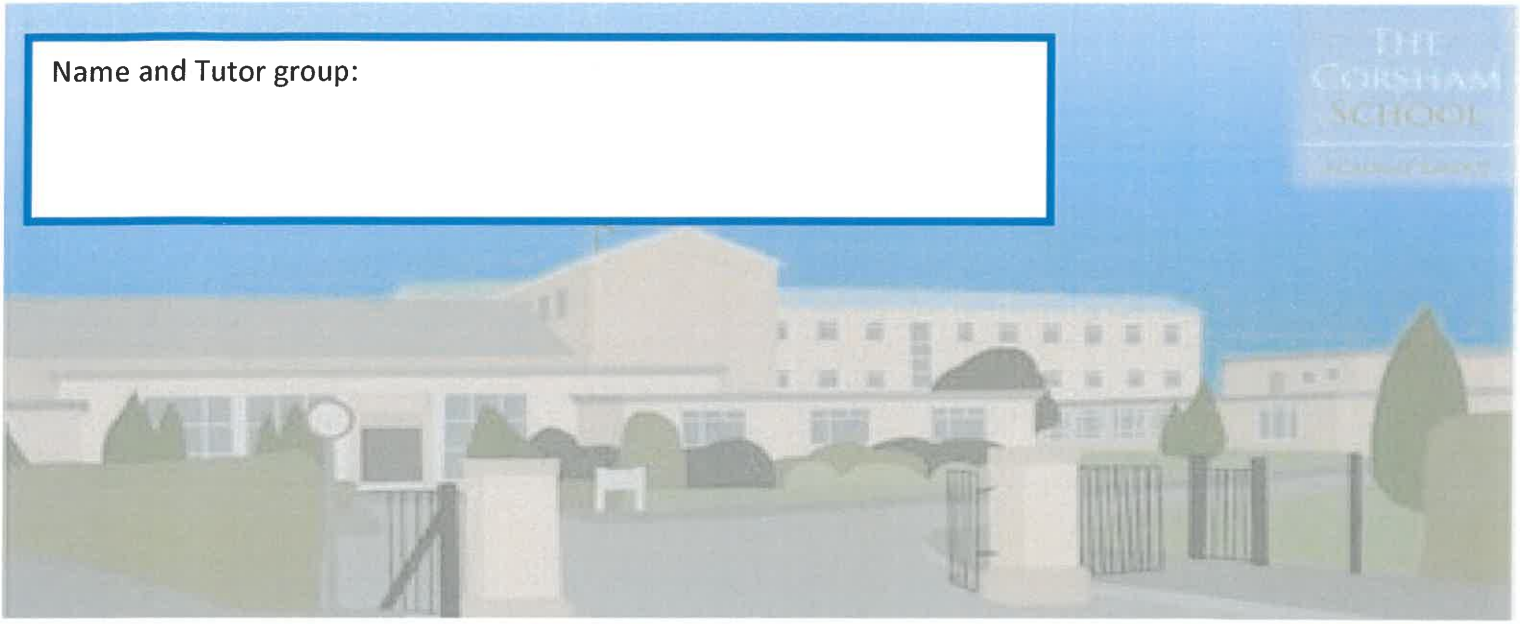
Name and Tutor group:



Year 8 Knowledge Organiser

Term 5

Contents

CORSHAM CHARACTER

INTELLECTUAL VALUES

The pursuit of truth, knowledge and understanding.

Be reflective. Be curious. Be open-minded. Be creative.

PERFORMANCE VALUES

Maximum effort, maximum focus.

Be resilient. Always Persevere. Contribute to Teamwork. Be ambitious.

DREAM BELIEVE ACHIEVE

Knowledge Organiser – Year 8 Art

Hundertwasser Landscapes

EXAMPLES OF FINAL OUTCOMES:

YOU WILL LEARN:

In this project you will explore the work artist Friedensreich Hundertwasser through the exploration of colour and shape. You will create your own 3D landscape with paper.

Why am I learning this?

To know the work of an artist and learn how to develop designs to create and embellish an A3 Imaginary landscape.

Homework Tasks:

Tick when complete ✓

1. Shapes patterns and colours of Hundertwasser's buildings.
2. Hundertwasser Research Page
3. Hundertwasser inspired stamp
4. Research on Hundertwasser's 5 Skin theory

HOW WELL AM I DOING?

Marking Your Work – Meeting Expectations

- NYM — NOT YET MET = Yellow Dot
- M — MET = Green Dot
- EX — EXCEEDING = Blue Dot

CONTEXTUAL KNOWLEDGE:

- Austrian Artist Hundertwasser is famous for his style of architecture, landscape drawing and painting.
- He recreated the facades of buildings by adding additional features, and by using soft flowing lines and bright colours to alter existing buildings.

Keywords

Embellish	To make beautiful with ornamentation
Surreal	Bizarre unusual strange. Things combined in a strange, unreal and dreamlike way.
Complementary Colours	Two colours that are on opposite sides of the colour wheel. This combination provides a high contrast and high impact colour combination.
Contour lines	Following the edges of shapes.

Video to Watch:
Hundertwasser and his Dreamscapes

Y8 computational thinking

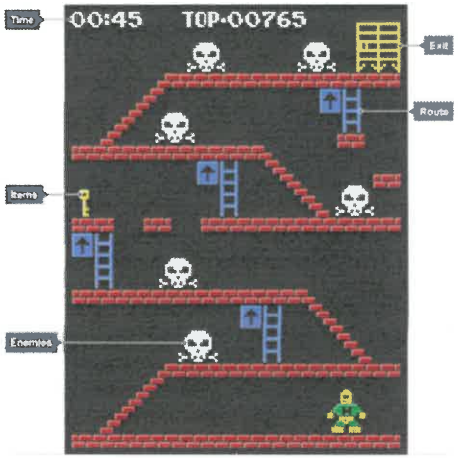
The four stages of Computational thinking

- **Decomposition** - breaking down a complex problem or system into smaller, more manageable parts
- **Pattern recognition** – looking for similarities among and within problems
- **Abstraction** – focusing on the important information only, ignoring irrelevant detail
- **Algorithms** - developing a step-by-step solution to the problem, or the rules to follow to solve the problem

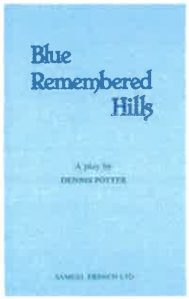
Computer Science and CT

Thinking computationally is **not programming.** It is not even thinking like a computer, as computers do not, and cannot, think.

Simply put, **programming tells a computer what to do and how to do it.** Computational thinking enables you to **work out exactly what to tell** the computer to do.



- each complex problem was broken down into several small decisions and steps (eg where to go, how to complete the level – **decomposition**)
- only the relevant details were focused on (e.g. enemies, location of exit – **abstraction**)
- knowledge of previous similar problems was used (**pattern recognition**...
- ...to work out a step by step plan of action (**algorithms**)



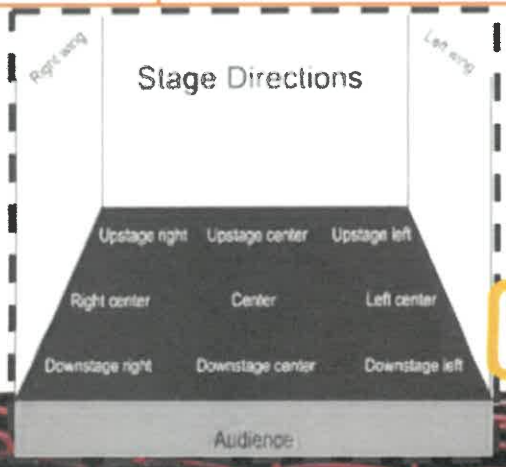
Drama

Year 8 Knowledge Organiser

Creating a performance from a script

KEY PHYSICAL SKILLS	
Gesture	How everyday actions, such as shaking hands or putting on a jacket, express something about a character. What single gestures, like a wave or hug can reveal about a character.
Facial Expression	How different facial expressions reflect different characters and their moods. How eye movements can convey feelings and relationships.
Over Exaggeration	Exaggeration is a representation of something in an excessive manner. Overacting is the exaggeration of gestures and speech when acting.
Body Language	The gestures, postures, and facial expressions by which a person manifests various physical, mental, or emotional states and communicates nonverbally with others.
Slow Motion	How quickly or slowly a character makes a gesture or moves across the stage and how it influences our opinion of them.

DRAMA TECHNIQUES	
Freeze Frame	The action is frozen like a photograph.
Split Scene	Cutting from scene to scene.
Improvisation	Improvisation is a state of being and creating action without pre-planning. This can be when an individual or group is acting, dancing, singing, playing musical instruments, talking, creating artworks, problem solving, or reacting in the moment and in response to the stimulus.
Hot Seating	You are in role and people ask you questions about your background, behaviour and motivation.
Role on the Wall	Role on the Wall is a visual map that invites the actors to explore the inner feelings and outer influences on a character, place, or idea.
Thought Tracking	When frozen you speak the thought in the character's head aloud.
Levels	Using heights and proxemics to demonstrate meaning and relationships to the audience.



THE STAGE	
Set	The set is the constructed or created setting in which a play takes place.
Props	The props are the items used during a performance.
Costume	All the clothes and accessories an actor wears to demonstrate meaning and/or character.
Masks	Masks are a form of covering the face enabling actors to represent different people or beings leading to a more striking and effective performance.
Make-Up	Make-up is the cosmetic paint, powder and colouring used on stage to make faces and expressions visible to the audience.
Lighting	The use of artificial light to create a range of effects and moods, or to direct the audience's attention.
Sound	This includes everything the audience hears.

"*All the world's a stage.*"
William Shakespeare

Blocking is:
- **the precise staging of actors.**
- **working out an actors movements on the stage.**

"*We must all do theatre, to find out who we are, and to discover who we could become.*"
Augusto Boal

Tips for Learning Lines:

- Read the Entire Script:
- Highlight Your Lines:
- Read Aloud:
- Write Your Lines out:
- Run Lines with a Partner:
- Regular Practice:
- Prioritise Weak Areas:
- Use Apps: Run Lines With Me or Script Rehearser
- Make Audio Recordings: *(You can even record the other characters' lines and leave gaps for your lines to practice speaking.)*
- Learn Your Cues:

Year 8 Food and Nutrition- Knowledge Organiser

Nutrient/ Food group	Functions - Why do we need it?	Sources - Where they are found
Carbohydrates	These give us energy. Sugary ones give us quick release energy. Starchy ones give us slow release.	Bread, rice, pasta, potatoes
Protein	Needed for the growth and repair of our bodies and can also be used for energy.	Meat, fish, dairy products, tofu, soya, Quorn, nuts, sees, lentils
Fat	These keep us warm, protect us and provides our bodies with energy	Butter, oil, processed foods e.g. crisps, chips, chocolate, cake.
Water	Keeps us hydrated and keeps our body's working properly.	Fruit and vegetables, water, fruit juices, milk.
Vitamins	These are needed generally to keep us healthy. The allow all the chemical reactions in our body and protect us from diseases.	Fruit, vegetables, cereals, dairy products
Minerals	Helps build bones and teeth and allow muscles to work properly.	Green vegetables, dairy products and red meat
Fibre	These are needed to keep our digestive system working (help us go to the toilet) and helps to fill us up.	Wholegrain cereals, brown rice, pasta, bread, fruit and vegetables

Healthy eating

The Eatwell guide shows how much of what we eat in total should come from each of the five food groups.

Oils and Spreads	Fruits and Vegetables	Meat, eggs and pulses	Starchy foods	Dairy foods
Butter, Vegetable oil, Margarine	Apples, Bananas Oranges, Pepper Carrots, Cabbage Spinach, Frozen peas	Chicken, fish, Lentils Chickpeas, beans	Bread, Potatoes Pasta, Rice, Cereals	Milk, Cheese, Yogurt

Keywords

Hygiene
Safety
Vegetarian
Vegan
Nutrient
Food Allergy
Organoleptic
Cross - contamination
Food Intolerance
Coeliac Disease

What is Energy balance

Energy in = energy out

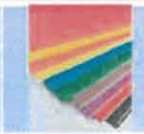
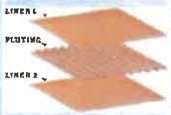
Why is it important to keep it balanced?

To maintain a healthy weight and allow the body to stay healthy and work efficiently

Special diet	Type	Reason for following diet	Foods to avoid
Lifestyle/ religion	Vegan	• Religion • Don't like the taste • Don't want to eat animals • Ethical reasons • Cost of meat • Texture of meat	Anything from an animal, honey
	Vegetarian		Meat and fish products
	Pescatarian		Any meat products
Allergy & intolerance	Lactose	• Intolerance	milk, cheese, yoghurt, chocolate, butter etc
	Coeliac	• Allergy	wheat, bread, pasta, barley, oats
Health	High Fibre	• Recommended by doctor • Healthier	White rice, pasta, bread, processed foods.
	Low Sugar	• Weight loss • Healthier • Diabetic	Biscuits, cakes, sweets, fizzy drinks, processed food
	Low Fat	• Weight loss • Healthier • High Cholesterol	Crisps, chips, sausage rolls, cakes, biscuits.

Year 8 Graphics: Pop-up book DESIGN AND TECHNOLOGY

Tools, Techniques, Materials and Equipment

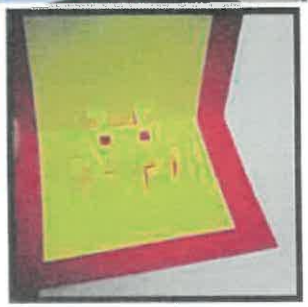
Paper		A compliant material made from wood pulp.
Board		Used for packaging, model making, photography and greeting cards.
Colour Rendering		A colour technique used for professional finish in DT.
Scoring		A method to create accurate folds.
Craft knife		To accurately cut paper.

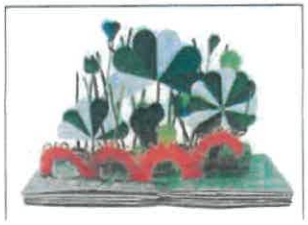
Robert Sabuda

The American illustrator who creates pop-up books.

Keywords

- Robert Sabuda
- Product
- Image
- Analyse
- Paper Sizes
- Typography
- Fonts
- Printing
- Processes
- Story Board
- Card
- Mechanisms
- Card Modelling
- Shading
- Rendering
- Rotary
- V-fold
- Internal
- Stand
- Mouth and Slide





Maths in DT:

- Multiplication
- Divide
- Add / Subtract
- Measurement conversion
- Ratios
- Percentages
- Surface area

What is good design?

- Clear ideas
- Annotations
- Measurements
- Content
- Presentation
- Balance

Health and Safety in DT:

- Listen to your teacher's instructions
- Always wear an apron
- Long hair should be tied back
- Don't use equipment you are not trained on
- Always stand up during practical lessons
- When using machines, always wear safety glasses
- Only use the stop button in an emergency
- Work quietly and be sensible and careful at all times

KS3 YEAR 8 D&T RESISTANT MATERIALS

Tools and Equipment

Measuring and marking

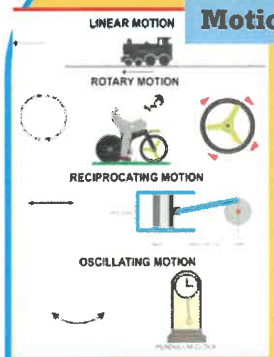
Steel rule		An accurate tool for measuring and marking out
Try square		A tool used to check right angles on wood or plastic
Template		A template is a tool used to mark out shapes repeatedly
Jig		A tool used to control the location and/or motion of another tool

Shaping and finishing

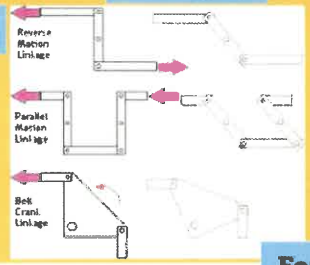
Metal file		Used to shape or smooth wood, metal or plastic
Glass paper		An abrasive paper used to smooth the surface or edges of wood
Disc sander		A machine used to smooth the edges of materials

Mechanical Devices

Motion

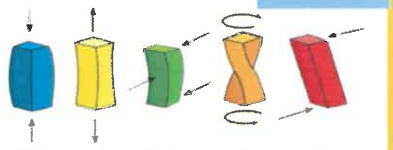


Linkages

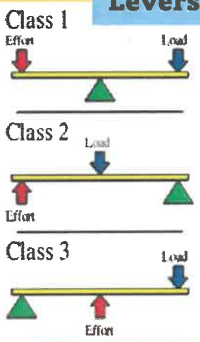


Gears

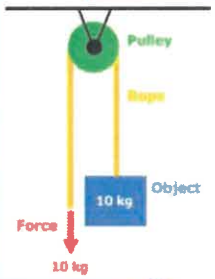
Forces



Levers



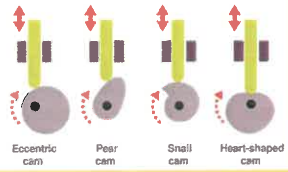
Pulley



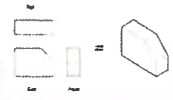
Cams

Types of cams

- Different shaped cams are used for different tasks:



Orthographic Drawing



Cutting

Tenon saw		A hand saw with a stiff back used to cut straight lines in wood – back saw action
Coping saw		A hand saw used to cut complex shapes in wood and plastic
Scroll saw		A machine saw used to cut complex shapes in wood and plastic
Bench hook		Held against the front edge of a bench or table to support work
Pillar drill		A machine used to make holes in materials
Chisel		Used for carving or cutting a hard material such as wood, stone, or metal by hand
Laser cutter		CAM: Laser cutting is the use of a high-powered laser to cut, etch and engrave your material

Traditional wood joints:

- Butt Joint
- Lap / Rebate Joint
- Finger Joint
- Dovetail Joint
- Mitre Joint

Maths in DT:

- Multiplication
- Divide
- Add / Subtract
- Measurement conversion
- Ratios
- Percentages
- Surface area

What is good design?

- Clear ideas
- Annotations
- Measurements
- Content
- Presentation
- Balance

Keywords

Research	Pulley
Design	Linkage
Evaluation	Lever
Wood joint	Motion
Mechanical	Force

Health and Safety in DT:

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- Always stand up during practical lessons
- When using machines, always wear safety glasses
- Only use the stop button in an emergency
- Work quietly and be sensible and careful at all times

KS3 YEAR 8

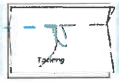
DT TEXTILES

Tools and Equipment

Measuring and marking

Measuring Tape		Fabric tape measure used to measure
Tailor's chalk		A temporary mark on fabric
Template / Pattern		A template / pattern is a tool used to mark out shapes repeatedly

Constructing

Sewing needle		Helps to sew fabric together
Embroidery needle		A needle with a larger eye to accommodate embroidery thread
Sewing machine		Machine sews fabric together
Pins		A temporary method to hold fabric in place
Tacking stitch		A temporary stitch to hold fabric together

Textiles Dyes:

Natural Dyes

- **Plants**
- **Food / spices**
- **Grass / tree bark / leaves**
- **Onions / beetroot**
- **Cochineal**

Chemical Dyes

Dyes which are man-made using chemicals: consistent and vibrant.

Fibre Categories:

Natural Fibres

Plant based natural fibres:

- **Cotton**
- **Linen**
- **Flax**
- **Coir (coconut)**

Animal based natural fibres:

- **Wool**
- **Angora**
- **Silk**

Man-made Fibr

- **Polyester**
- **Acrylic**
- **Nylon**

Fabric Construction:

Woven

Knitted

Bonded

Keywords

Islamic
Religion
Design
Product analysis
Research
Evaluation
Stitch
Scissors
Sewing machine
Customer
Environment
Function
Material
Seam allowance
Hem
Tie-Dye
Printing
Tesselate
UCD
Mordant

Cutting

Fabric shears		Scissors used for cutting fabric
Thread scissors		Scissors used for cutting thread
Stitch ripper		Used for removing sewn stitches from fabric
Pinking shears		Creates a zig zag cut edge for decoration to prevent fraying

Adding Colour

Tie-dye		A type of resist dye
Batik		A type of resist dye which uses wax
Block Printing		Engraved wooden blocks to produce repeat patters
Fabric paint / pens		Paint / pens which can be applied to fabrics

Element s that make up Islamic Design:
Calligraphy
Floral
Geometry

Maths in DT:

Multiplication
Divide
Add / Subtract
Measurement conversion
Ratios
Percentages
Surface area

What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Health and Safety in DT:

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A is for **Aesthetics**
C is for **Cost**
C is for **Customer**
E is for **Environment**
S is for **Size**
S is for **Safety**
F is for **Function**
M is for **Material**

THE CORSHAM SCHOOL ACADEMY GROUP

Y8 ENGLISH – ANIMAL FARM

Context

- Orwell was a Socialist.
- He despised the cruelties in the Soviet Union model of socialism.
- The novel is an anti-totalitarian novel.
- Each character represents different historical figures.
- Pig represent educated Russians who took power.
- Moses represents the exploitation of religion in communism.
- The Sheep represent the Russian Masses. The Hens – collective farmers ordered by Stalin to surrender their livelihoods.

An allegorical tale with direct links to the history of the Soviet Union in the early 20th century. The book charts the corruptions of **Communist** ideals of equality, where workers are promised equality and freedom and are eventually repressed and treated as bad, if not worse, as under the previous rule of the **capitalist 'Tsar'. Snowball** represents **Trotsky**, a passionate component of **Animalism (Communism)** who is expelled by **Napoleon (Stalin). Napoleon** follows a similar rise to power as **Stalin**, using fear and propaganda to control the masses, including show trials and executions. By the end of the novel, the **ideals of communism** have been so far abused and forgotten, that Napoleon meets and forms agreements with former oppressors. Orwell was a British journalist and author, who wrote two of the most famous political novels of the 20th century 'Animal Farm' and 'Nineteen Eighty-Four'. When Orwell saw a kid whipping a horse, he had an idea: "It struck me that if only such animals became aware of their strength we should have no power over them, and that men exploit animals in much the same way as the rich exploit the working class". This inspired him to write the novel.

WHAT? MAKE A STATEMENT **POINT**

HOW? LOOK AT THE TEXT AND **TECHNIQUES** **EVIDENCE**

HOW? MEANS? SUGGESTS? **ANALYSIS**

WHY? MAKE DEVELOPMENTS **LINKS**

KEY TECHNIQUES		
Narrative voice	Semantic field	Imagery
Sibilance	Tension	Verb
Pathetic fallacy	Alliteration	Adjective
Contrast	Figurative	Personification
Juxtaposition	Symbolism	Motif

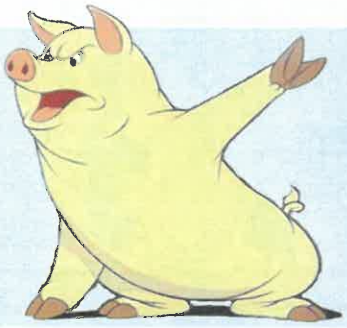
METHODS	DEFINITION
Symbolism	Use of symbols to represent ideas or qualities
Imagery	Visually descriptive language
Motif	A recurring set of words/phrases or imagery for effect
Allegory	Extended metaphor in which a symbolic story is told
Omniscient third person narrative	All knowing narrator who is not involved in the action but sees it all happening

THE CORSHAM SCHOOL

Y8 ENGLISH – ANIMAL FARM

CHAPTER	GUIDE TO EVENTS
CH1	The animals hold a meeting to discuss overthrowing the humans. They decide on rules if they are successful.
CH2	The animals run the men off the farm & the Jones' and rename it Animal Farm, destroying signs of slavery
CH3	The animals work hard to collect the harvest, a committee is established & the pigs take more than their share of the rations.
CH4	Jones tries to retake the farm. News of it has spread & neighbouring farmers are worried. The animals win The Battle of the Cowshed.
CH5	Mollie leaves the farm. Napoleon takes over all the decisions.
CH6	The pigs move into the farmhouse, they trade and the animals work hard to farm and build the windmill, overcoming setbacks. A storm destroys the windmill.
CH7	Napoleon starves the hens when they refuse to lay more eggs, he convinces them off a different version of The Battle of the Cowshed.
CH8	The pigs re-read the commandments, change them and get drunk. Frederick buys timber with forged money & blows up the windmill.
CH9	Th piglets go to school, the farm becomes a republic with Napoleon as the President, Boxer looks forward to retiring, his strength fails and he is sent to the slaughterer. Most animals don't realise & whiskey arrives from the money confusing them.
CH10	Time passes, animals die, the conditions are poor for most and the pigs act like humans. The other animals can't tell the animals from the humans.

VOCABULARY	DEFINITION
Revolution	Forcible overthrow of a government or social order
Animalism	System designed by Old Major for a happy life free of human interference
Commandments	Seven rules by which the animals will live
Unalterable	Cannot be changed or adapted
Capitalism	an economic & political system where a country's trade & industry are controlled privately for profit, rather than by the state.
Socialism	An economic & political system where trade & industry are controlled centrally for the good of all
Patriotic	Being devoted to your country
Corruption	Dishonesty or fraudulent behaviour by rulers
Republic	A state where power is held by the people & their elected officials (America is a republic) (Britain is a Monarchy)
Exploitation	Treating someone unfairly to benefit from their work



What is a natural resource?

Something that occurs naturally (without any human help) which we can make use of. These include soil, water, crops, sunlight.

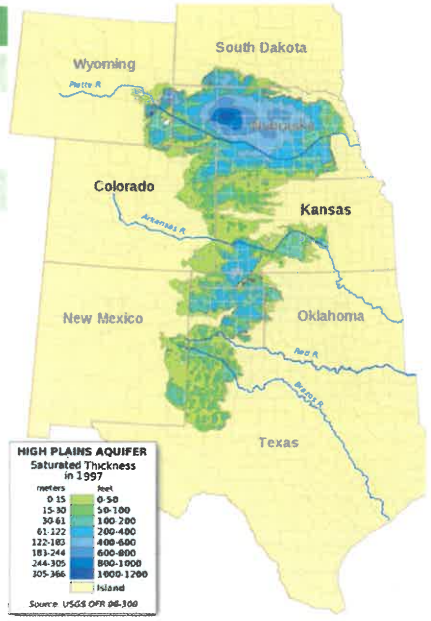
Renewable resources	Non renewable resources
A resource that we can keep using and it will not run out. e.g. wind, sunlight	If we continue to use the resource it will run out. This is also called a finite resource. e.g. copper, oil, gas

The Ogallala

The Ogallala is an aquifer in the USA..

An aquifer is an underground rock that stores water This can happen if the rock is permeable.

What an aquifer can do	What is the problem
The Ogallala provides enough water to grow the crops needed to feed America. It is huge and covers 8 US states.	The USA has been using the aquifer for a century as a result the water levels in the aquifer are dangerously low. When this water runs out USA will not be able to grow all the crops it grows today.

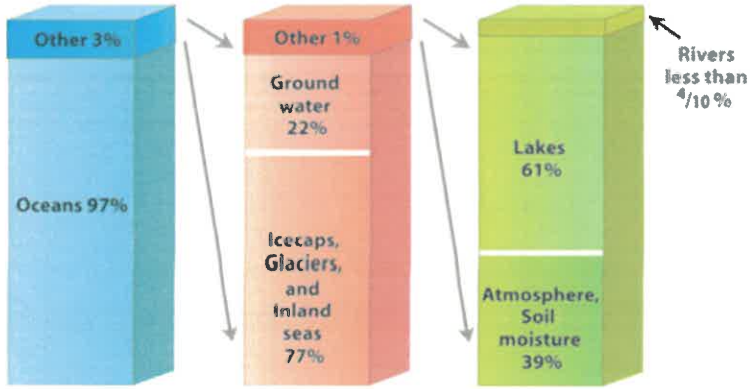


Tackling water stress

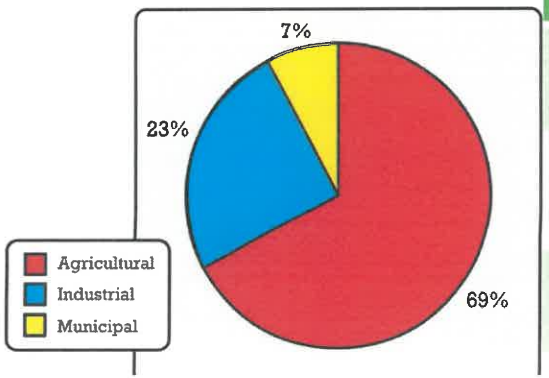
Stop wasting it	In 2020 in the UK, 3 billion litres of water was wasted. Fixing leaks can reduce this. Farming wastes a lot of water but by using "drip irrigation", farmers can be efficient with the water they use.
Recycle it	In the UK, the waste water is cleaned then returned to rivers. In some countries the waste water is cleaned then used for crops. In some cities the waste water is super cleaned and used for drinking. 90% of water in Israel is recycled.
Move it	We can transfer water from areas that have a lot to areas that don't. In China they have built canals that move water from the wet south to the dry north. This reduces water insecurity.
Take it from the sea	Desalination is the process of turning salt water into drinking water. This in theory is great as there is an infinite supply of water however this is very expensive and uses a lot of electricity.

Yr8 Geog: Can we provide resources for 9 billion people?

Distribution of Water on Earth



Global Water Use



Global water use

Globally we use most of our water for farming. However, the more developed we are the more water we will use at home. This is because we need more water for appliances such as washing machines

The Earth has a vast amount of water but 97% of it is unusable as it is in the sea. OF the 3% of fresh water 70% is locked away in glaciers and ice caps so we can't access it.

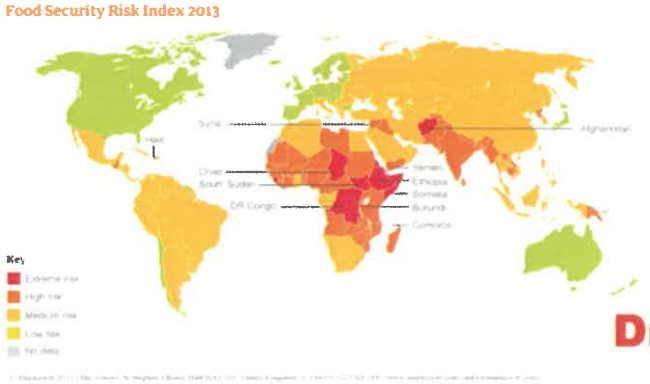
Water stress is where a country doesn't have enough water to meet its needs. This can happen to either a lack of fresh water or too many people in the country.

Yr8 Geog: Can we provide resources for 9 billion people?

What is food insecurity?

Food security is where a country provides enough food to healthily feed their entire population. Currently 2 billion people are not food secure, these countries are mostly found in Africa.

Physical causes of food insecurity	Human causes of food insecurity
• Pests and disease destroys crops • Not enough rainfall to grow crops • Climate change reduces rainfall	• Conflict in the country means food can't be transported. • Poverty means food can't be transported. • Poverty means they can't buy enough food.



IS the UK food secure?

The UK has a high level of food security. However, many families struggle with food insecurity.

Reasons why the UK does not have full food security

Population growth	Our population is growing and we are becoming more developed so we want a wider range of food. Plus we create a lot of food waste.
Politics	Government make trade deals for trading food..A lot of trade is taxed (tariffs) If countries increase their tariffs, food becomes more expensive and so families may not be able to afford the food they want. Currently we import 30% of our food from the EU
Climate change	Other countries are going to have less food to sell us. British farmers will struggle with heatwaves and floods.

Drought Resistant Crops

Reducing food waste

Food miles explain how far food has travelled to get to your plate. The more developed a country is the greater the food miles and the more impact on the planet. More food miles means that you carbon footprint has been increased.

Eating produce in season	IF we can eat produce that is grown locally in season it will reduce the amount of food miles. This will reduce your own carbon footprint.
Eating up left oever.	Eating left overs means that less food gets sent to landfill sites will in turn reduce the amount of methane being

Tackling food insecurity

Aid and charity work	By providing help to local farmers in LIDCs, (seeds and fertiliser). More crops can be grown and local families can become food secure.
Technology	Mobile phones are now all over the world. Local people in LIDCs can apply for food vouchers on their mobile phones.
Drought resistant crops	Technology has meant that we can now develop crops which can be grown with minimal water – perfect for countries that get a lot of drought.

Enquiry: How much has democracy changed?

Outline: During the 19th century, many people began to realise that they were not listened to by the government because they didn't have the right to vote. This led to many pressure groups being set up to try and gain equality for all though everyone having the vote. However, this was not easily achieved.

Date	Event	Description
1819	Peterloo massacre	18 people were killed and 400-700 were injured during a demonstration of 60,000 in Manchester. Protesters had been asking for the right to vote.
1832	Great Reform Act	More people given the right to vote from the middle class, but still now working class people
1882	Women's Property Act	Women were now allowed to keep their property when they married.
1903	WSPU set up	The Pankhurst family set up a pressure group to campaign for the right to vote for women as they believed that progress was too slow.
1913	Death of Emily Davison	Davison was killed by the king's horse during a race called the Epsom Derby. She was carrying a suffragette flag when she was hit.
1918	Representation of the People Act.	All men over 21 and women over the age of 30 who owned property were given the vote. It wasn't until 1928 that all women over 21 had the vote.

Furthering learning
Want to find out more about the fight for democracy in the UK?

Prior learning?
Democracy
Patriarchy
Revolution

History – Year 8
Knowledge Organiser
Topic 4


The Six Points of the PEOPLE'S CHARTER.

Key individuals

Samuel Bamford. He was an eye witness to the Peterloo Massacre. His written account gained sympathy for those who were killed or injured.

William Cuffay. Born in the West Indies, Cuffay worked as a leading Chartist, campaigning for the right to vote. He became President of the London Chartists.

Millicent Fawcett. Led a pressure group called the NUWSS who campaigned peacefully for the vote for women. Her famous quote was "Courage calls to courage everywhere"

Emmeline Pankhurst. Set up the WSPU which was a more militant pressure group aiming at gaining the vote for women. Her famous quote was "Deeds, not words."

Key vocabulary:

Act: a law passed by parliament.
Chartists: a pressure group who fought for the right to vote for working class men. They were famous for their People's Charter.
Constituency: an area of a country which is represented in parliament by an elected MP
Democracy: a system where people have the right to choose the government through elections.
Direct action: acts which a pressure group uses to gain attention for a cause, like boycotts or marches.
Disenfranchised: when you are unable to vote because you are banned from doing so.
Franchise: the right to vote.
Massacre: the killing of several people at once, whether deliberately or by accident.
Militant: using confrontational or violent methods to achieve your aims for a cause.
Parliament: where laws are made . MPs in the House of Commons and peers in the House of Lords vote to pass these laws.
Pressure group: an organisation which aims to improve lives, like the Chartists, the WSPU or the NUWSS.
Reform: a change that intends to improve something.
Suffrage: the right to vote.
Suffragette: nickname given to those in the WSPU. They tended to use more militant tactics to achieve their goals.
Suffragist: nickname given to those in the NUWSS. They tended to use more peaceful methods to achieve their goals.
Terrorism: violent actions which hurt and scare people; often the aim is to achieve political goals.

Enquiry: How much has democracy changed?

Historical skill focus: change & continuity

- How have people's lives changed over time?
- How have people's lives stayed the same over time?

Remember to mention:	Areas you could mention include:	Starting sentences
Changes AND Continuities	Votes for middle class Votes for working class Votes for women	During the 19th and 20th centuries, there were many changes in how much power people had such as... However, some aspects of power did stay the same such as...

Point = A key change was...
Evidence = The important parts of this change included...
Explain = This was an important change because...

History – Year 8
Knowledge Organiser
Topic 4

Section A: Can you explain change and continuity?
Answer the question below: You could **write one or two paragraphs** to explain fully.
How far did the right to vote change during the 19th and 20th centuries?

Developing	Secure	Exceeding
I can identify key changes and key areas of continuity. I can describe key changes and areas of continuity.	I can explain the key changes/continuity areas in a PEE paragraph I can begin to think about the extent of change. I can use some historical knowledge to support my answer.	I can explain the key changes/continuity areas in a PEEL paragraph I can use detailed historical knowledge to support my answer. I can begin to use factors that affect change/continuity such as the economy, politics, religion...

YEAR 8 - DEVELOPING GEOMETRY...

@whisto_maths

Angles in parallel lines and polygons

What do I need to be able to do?

By the end of this unit you should be able to:

- Identify alternate angles
- Identify corresponding angles
- Identify co-interior angles
- Find the sum of interior angles in polygons
- Find the sum of exterior angles in polygons
- Find interior angles in regular polygons

Keywords

Parallel: Straight lines that never meet
Angle: The figure formed by two straight lines meeting (measured in degrees)
Transversal: A line that cuts across two or more other (normally parallel) lines
Isosceles: Two equal size lines and equal size angles (in a triangle or trapezium)
Polygon: A 2D shape made with straight lines
Sum: Addition (total of all the interior angles added together)
Regular polygon: All the sides have equal length; all the interior angles have equal size.

Basic angle rules and notation (R)

Acute Angles
0° < angle < 90°

Right Angles
90°

Right angle notation

Obtuse
90° < angle < 180°

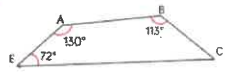
Reflex
180° < angle < 360°

Straight Line
180°

Vertically opposite angles
Equal

Angles around a point
360°

The letter in the middle is the angle
The arc represents the part of the angle



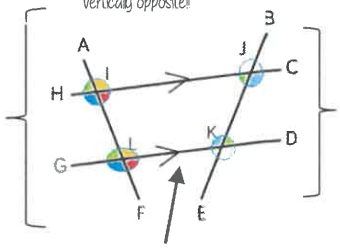
Angle Notation: three letters ABC
This is the angle at B = 113°
Line Notation: two letters EC
The line that joins E to C

Parallel lines

Still remember to look for angles on straight lines, around a point and vertically opposite!

Lines QF and BE are **transversals** (lines that bisect the parallel lines)

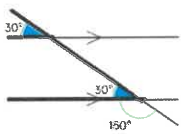
Corresponding angles often identified by their **"F shape"** in position



Alternate angles often identified by their **"Z shape"** in position

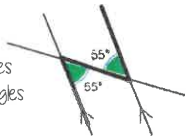
This notation identifies parallel lines

Alternate/ Corresponding angles

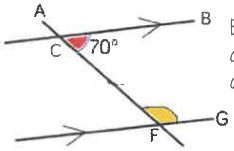


Because alternate angles are equal the highlighted angles are the same size

Because corresponding angles are equal the highlighted angles are the same size



Co-interior angles



Because co-interior angles have a sum of 180° the highlighted angle is 110°

As angles on a line add up to 180° co-interior angles can also be calculated from applying alternate/ corresponding rules first

Triangles & Quadrilaterals

Link to steps (R)

Side, Angle, Angle

Side, Angle, Side

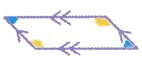
Side, Side, Side

Properties of Quadrilaterals

Square
All sides equal size
All angles 90°
Opposite sides are parallel

Rectangle
All angles 90°
Opposite sides are parallel

Rhombus
All sides equal size
Opposite angles are equal



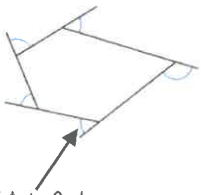
Parallelogram
Opposite sides are parallel
Opposite angles are equal
Co-interior angles

Trapezium
One pair of parallel lines

Kite
No parallel lines
Equal lengths on top sides
Equal lengths on bottom sides
One pair of equal angles

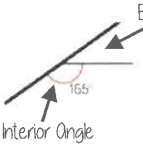
Sum of exterior angles

Exterior angles all add up to 360°



Exterior Angles
Are the angle formed from the straight-line extension at the side of the shape

Using exterior angles



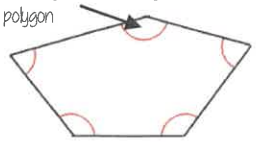
Interior angle + Exterior angle = straight line = 180°
Exterior angle = 180 − 165 = 15°

Number of sides = 360° ÷ exterior angle
Number of sides = 360 ÷ 15 = 24 sides

Sum of interior angles

(number of sides − 2) x 180

Interior Angles
The angles enclosed by the polygon



This is an **irregular** polygon – the sides and angles are different sizes

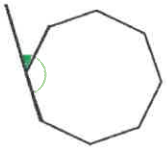
Sum of the interior angles = (5 − 2) x 180

This shape can be made from three triangles
Each triangle has 180°

Sum of the interior angles = 3 x 180
= 540°

Remember this is **all** of the interior angles added together

Missing angles in regular polygons



Exterior angle = 360 ÷ 8 = 45°

Interior angle = $\frac{(8-2) \times 180}{8} = \frac{6 \times 180}{8} = 135°$

Exterior angles in regular polygons = 360° ÷ number of sides

Interior angles in regular polygons = $\frac{(\text{number of sides} - 2) \times 180}{\text{number of sides}}$

YEAR 8 - DEVELOPING GEOMETRY...

Area of trapezia and Circles

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Recall area of basic 2D shapes
- Find the area of a trapezium
- Find the area of a circle
- Find the area of compound shapes
- Find the perimeter of compound shapes

Keywords

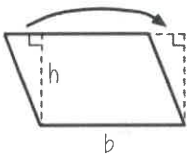
Congruent: The same
Area: Space inside a 2D object
Perimeter: Length around the outside of a 2D object
Pi (π): The ratio of a circle's circumference to its diameter.
Perpendicular: At an angle of 90° to a given surface
Formula: A mathematical relationship/ rule given in symbols. E.g. b x h = area of rectangle/ square
Infinity (∞): A number without a given ending (too great to count to the end of the number) – never ends
Sector: A part of the circle enclosed by two radii and an arc.

Area – rectangles, triangles, parallelograms

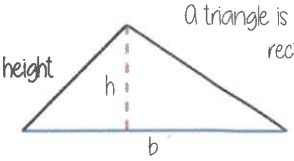
R

Rectangle
Base x Height

Parallelogram/ Rhombus
Base x Perpendicular height



Triangle
½ x Base x Perpendicular height

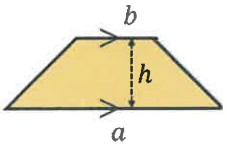


A triangle is half the size of the rectangle it would fit in

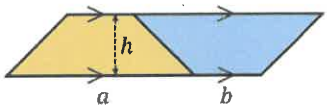
Area of a trapezium

Area of a trapezium

$$\frac{(a+b)\times h}{2}$$



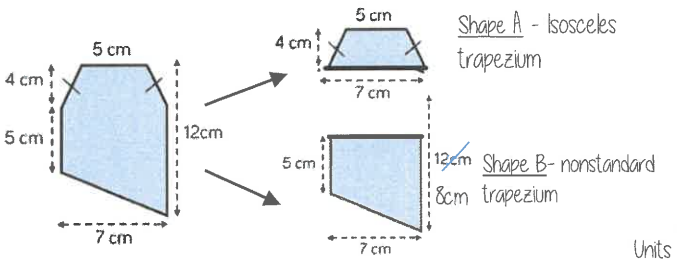
Why?



- Two congruent trapeziums make a parallelogram
- New length (a + b) x height
- Divide by 2 to find area of one

Compound shapes

To find the area compound shapes often need splitting into more manageable shapes first. Identify the shapes and missing sides etc. first



Shape A - Isosceles trapezium

Shape B - nonstandard trapezium

Units

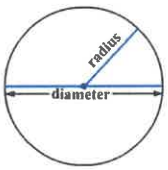
Shape A + Shape B = total area

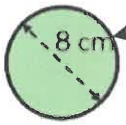
$\frac{(5+7)\times 4}{2}$ + $\frac{(5+8)\times 7}{2}$ = 24 + 45.5 = 69.5cm²

Area of a circle (Non-Calculator)

Read the question – leave in terms of π or if $\pi \approx 3$ (provides an estimate for answers)

Area of a circle
π x radius²





Diameter = 8cm
∴ Radius = 4cm

π x radius²
= π x 4²
= π x 16
= 16π cm²

Find the area of one quarter of the circle

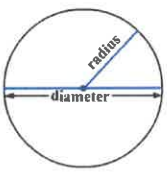
Radius = 4cm

Circle Area = 16π cm²
Quarter = 4π cm²

Area of a circle (Calculator)

SHIFT ×10^x

Area of a circle
π x radius²



How to get π symbol on the calculator

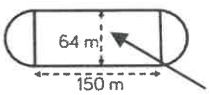
It is important to round your answer suitably – to significant figures or decimal places. This will give you a decimal solution that will go on forever!

Compound shapes including circles

Circumference
π x diameter

Compound shapes are not always area questions. For Perimeter you will need to use the circumference

Spotting diameters and radii



This dimension is also the diameter of the semi circles.

Arc lengths = π x 64
= 64 π

Don't need to halve this because there are 2 ends which make the whole circle

Arc lengths + Straight lengths = total perimeter

= 64 π + 150 + 150
= (300 + 64 π) m
OR = 501.1 m

Still remember to split up the compound shape into smaller more manageable individual shapes first

YEAR 8 - DEVELOPING GEOMETRY...

Line symmetry and reflection

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

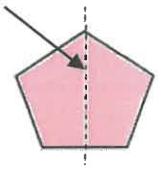
- Recognise line symmetry
- Reflect in a horizontal line
- Reflect in a vertical line
- Reflect in a diagonal line

Keywords

Mirror line: a line that passes through the center of a shape with a mirror image on either side of the line
Line of symmetry: same definition as the mirror line
Reflect: mapping of one object from one position to another of equal distance from a given line.
Vertex: a point where two or more-line segments meet.
Perpendicular: lines that cross at 90°
Horizontal: a straight line from left to right (parallel to the x axis)
Vertical: a straight line from top to bottom (parallel to the y axis)

Lines of symmetry

Mirror line (line of reflection)

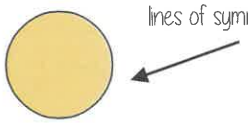


Shapes can have more than one line of symmetry.... This regular polygon (a regular pentagon has 5 lines of symmetry)

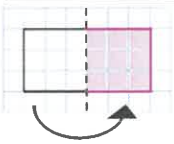
Rhombus
two lines of symmetry

Parallelogram
No lines of symmetry

A circle has an infinite amount of lines of symmetry

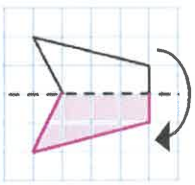


Reflect horizontally/ vertically (1)



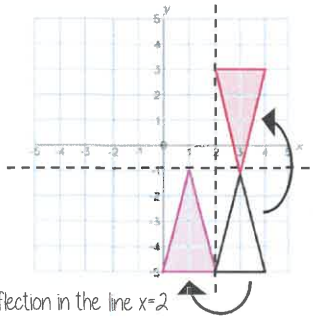
Note: a reflection doubles the area of the original shape

Reflection in a vertical line



Reflection in a horizontal line

Reflection on an axis grid

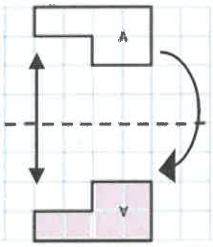


Reflection in the line y=-2

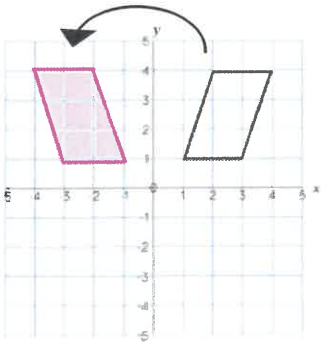
Reflection in the line x=2

Reflect horizontally/ vertically (2)

All points need to be the same distance away from the line of reflection



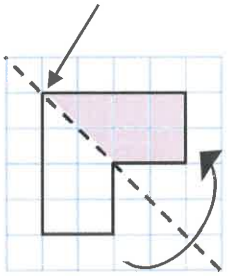
Reflection in the line y axis – this is also a reflection in the line x=0



Lines parallel to the x and y axis
REMEMBER
Lines parallel to the x-axis are y = ____
Lines parallel to the y-axis are x = ____

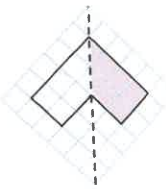
Reflect Diagonally (1)

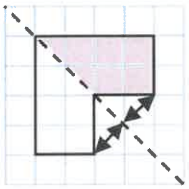
Points on the mirror line don't change position



Fold along the line of symmetry to check the direction of the reflection

Turn your image
If you turn your image it becomes a vertical/ horizontal reflection (also good to check your answer this way)



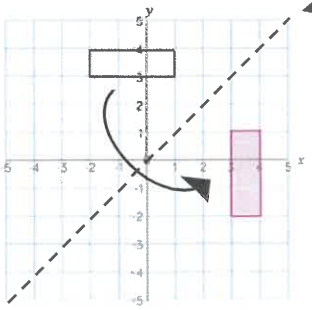


Drawing perpendicular lines

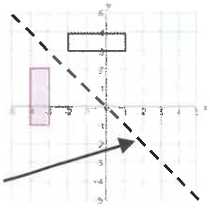
Perpendicular lines to and from the mirror line can help you to plot diagonal reflections

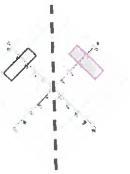
Reflect Diagonally (2)

This is the line **y = x** (every y coordinate is the same as the x coordinate along this line)



This is the line **y = - x**
The x and y coordinate have the same value but opposite sign





Turn your image
If you turn your image it becomes a vertical/ horizontal reflection (also good to check your answer this way)

Exploring Instruments of the Orchestra

A. Key Words, Terms and Facts about the Orchestra

ORCHESTRA – A large **ENSEMBLE** (group of musicians) of performers on various musical instruments who play music together. No set numbers of performers although a **SYMPHONY ORCHESTRA** (a large orchestra) can have between **80-100+** performers. Famous orchestras include: **THE LONDON SYMPHONY ORCHESTRA, THE BBC SYMPHONY ORCHESTRA** and the **HALLÉ ORCHESTRA** (Manchester).

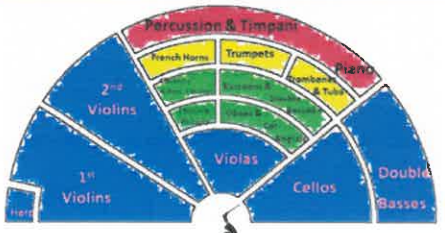
CONDUCTOR – Leads the orchestra with a **BATON** (white 'stick') and hand signals. Stands at the front so they can be seen my all performers. Sets the **TEMPO** and **BEATS TIME.** Brings different instruments 'in and out' when it is their turn to play. Keeps the performers together. Takes charge in rehearsals. In ultimate control of the performance of the music, adjusting **DYNAMICS, TEMPO,** and mood.

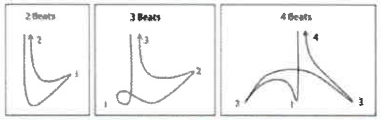
FAMILIES/SECTIONS – Instruments of the orchestra can be divided into 4 families or sections: **STRINGS, WOODWIND, BRASS** and **PERCUSSION.**

TUNING UP – Before the orchestra rehearses or plays, all instruments need to be **IN TUNE** with each other. The **OBOE** always sounds the note **'A'** which all other instruments **TUNE** to.

SONORITY (also called **TIMBRE**) – Describes the **UNIQUE SOUND OR TONE QUALITY** of different instruments and the way we can identify orchestral instruments as being distinct from each other –Sonority can be described by many different words including – ***velvety, screechy, throaty, rattling, mellow, chirpy, brassy, sharp, heavy, buzzing, crisp, metallic, wooden etc.***

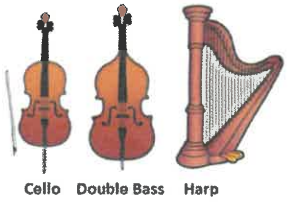
PITCH - The **HIGHNESS** or **LOWNESS** of a sound, a musical instrument or musical note (***high/low, getting higher/lower, step/leap***).





C. Strings Section/Family

Largest section of the orchestra who sit at the front, directly in front of the conductor. Usually played with a **BOW (ARCO)**, (not the **HARP**) but can be **PLUCKED (PIZZICATO)**. **VIOLINS** split into two groups: **1st VIOLINS** (often have the main **MELODY** of the piece of music) and **2nd VIOLINS**.



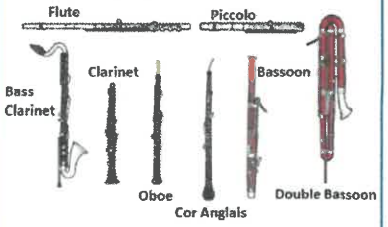
D. Woodwind Section/Family

Originally (and some still are) made from wood (some now metal and plastic). All are **BLOWN**.

FLUTES: Flute and Piccolo – air blown over hole.

SINGLE REED (small piece of bamboo in the mouthpiece): Clarinet, Bass Clarinet & Saxophone (not traditionally in the orchestra, but some modern composers have used it)

DOUBLE REED (two reeds in the mouthpiece): Oboe, Cor Anglais, Bassoon, Double Bassoon.



E. Brass Section/Family

Four types of brass instruments in an orchestra, all made from metal – usually brass and **BLOWN** by the player 'buzzing their lips' into a **MOUTHPIECE** *(shown right)*.

The Trumpet, French Horn and Tuba all have three **VALVES** which, along with altering the players mouth positions, adjust the length of the tubing allowing for different notes to be played. The Trombone has a **SLIDE** which adjusts the length of the tubing. Brass instruments (along with Percussion) have often been used to play **FANFARES**: a short, lively, loud piece of music usually warlike or victorious in character used to mark the arrival of someone important, give a signal *e.g., in battles*, of the opening of something *e.g., a sporting event or ceremony*.

Fanfares often use notes of the **HARMONIC SERIES** – a limited range of notes played by **BUGLES** (smaller trumpets with no valves) and valveless trumpets.

F. Percussion Section/Family

Always located at the very back of the orchestra (due to their very loud sounds!). Large number of instruments which produce their sound then ***hit, struck, scraped, or shaken.***

TUNED PERCUSSION (able to play different pitches/notes)

Piano Xylophone Glockenspiel Timpani Celesta Tubular Bells

UNTUNED PERCUSSION (only able to produce 'sounds').

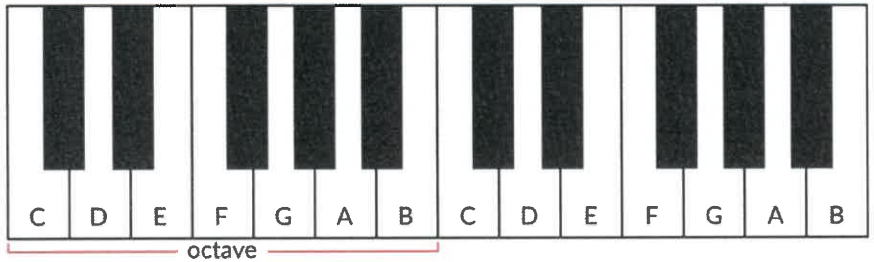
Bass Drum Snare Drum Cymbals Woodblock Guiro

Triangle Gong Tambourine Cabasa Maracas

Keyboard Skills

Exploring Treble Clef Reading and Notation

A. Layout of a Keyboard/Piano

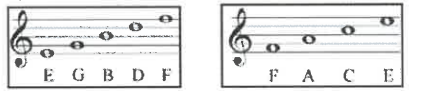


A piano or keyboard is laid out with **WHITE KEYS** and Black Keys (see section G). C is to the left of the two Black Keys and the notes continue to G then they go back to A again. Notes with the same letter name/pitch are said to be an **OCTAVE** apart. **MIDDLE C** is normally in the centre of a piano keyboard.

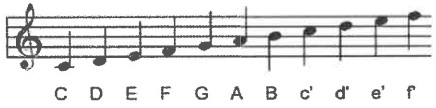
B. Treble Clef & Treble Clef Notation

A **STAVE** or **STAFF** is the name given to the five lines where musical notes are written. The position of notes on the stave or staff shows their **PITCH** (how high or low a note is). The **TREBLE CLEF** is a symbol used to show high-pitched notes on the stave and is *usually* used for the right hand on a piano or keyboard to play the **MELODY** and also used by high pitched instruments such as the flute and violin. The stave or staff is made up of 5 **LINES** and 4 **SPACES**.

Every Green Bus Drives Fast. Notes in the SPACES spell "FACE"



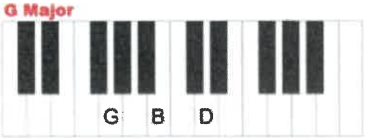
Notes from **MIDDLE C** going up in pitch (all of the white notes) are called a **SCALE**.



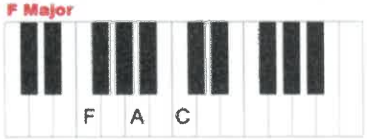
C. Keyboard Chords

C Major

G Major



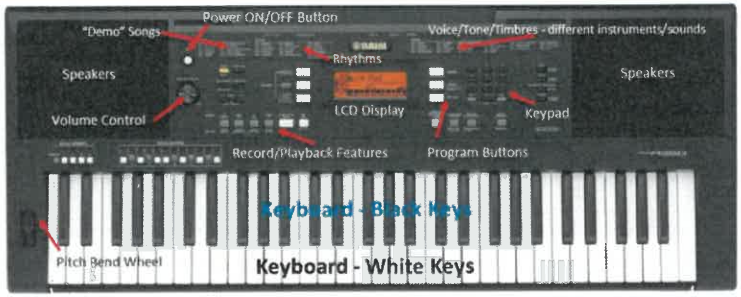
F Major



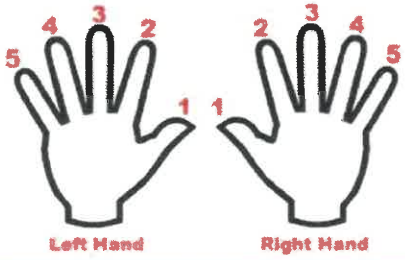
A Minor

Play one – Miss one – play one – miss one – play one

D. Keyboard Functions

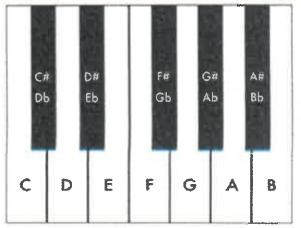


E. Left Hand/Right Hand (1-5)



F. Black Keys and Sharps and Flats

There are five different black notes or keys on a piano or keyboard. They occur in groups of two and three right up the keyboard in different pitches. Each one can be a **SHARP** or a **FLAT**. The # symbol means a **SHARP** which raises the pitch by a semitone *(e.g. C# is higher in pitch (to the right) than C)*. The *b* symbol means a **FLAT** which lowers the pitch by a semitone *(e.g. Bb is lower in pitch (to the left) than B)*. Each black key has 2 names – C# is the same as Db – there's just two different ways of looking at it! Remember, black notes or keys that are to the RIGHT of a white note are called SHARPS and black notes to the LEFT of a white note are called FLATS.



Key Terms

Ageism, – discrimination on the grounds of being old, middle age or young

Discrimination – putting prejudiced thoughts into action

Equality – where everyone has the same value and importance

Harmony – to live peacefully with understanding and respect

Homophobia – discrimination on the grounds of sexuality (gay and lesbian people)

Justice – to treat people fairly according to the law

Positive discrimination – benefits given to those who usually face negative discrimination in order to make up for it, .i.e. all women shortlists for gov't

Prejudice – pre judging someone, (usually negatively) without evidence

Racism – Discrimination on the grounds of skin colour (race)

Religious prejudice – Prejudice on the grounds of faith or belief which can lead to discrimination.

Choose from the following options:

a) Easy – Green

b) Medium - Green & Orange

c) Difficult - Green & Orange & Purple

Develop	Extend	Challenge
Prejudice	Stereotype	Human rights
Discrimination	Justice	Pacifism
Racism	Tolerance	Segregation
Sexism	Harmony	The value of the individual
Ageism	Equality	Liberalism

SANCTITY OF LIFE - All life is sacred and special to God, (but human's more special as made in IMAGE of God) therefore WE ARE ALL EQUAL.

Christians should **actively fight** against discrimination e.g. Dr Martin Luther King, a black Christian minister who fought in a non-violent way against racism in America.

Traditionally, women were seen as **EQUAL but DIFFERENT ROLES. Roman Catholics** and others don't allow women to be priests as they are representing Jesus (a man). **Others** see all as having equal opportunity as all the **SAME in God's eyes.**

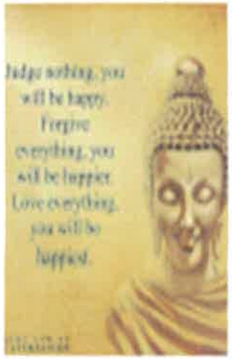
There are a **range of views on homosexuality** in Christianity but most would **not agree with persecuting them** or making them suffer.

"There is neither Jew nor Gentile, slave or free man, male or female. We are all one in Christ" (NT)

Jesus also said *'Love your neighbour as you love yourself'*

When people discriminate, their behaviour reflects an ignorant attitude towards other people. Buddhists believe that ignorance and craving cause people to suffer – known as dukkha.

Although they recognise that suffering is a part of life, they also believe that it is important to do what they can to avoid unnecessary suffering through their own actions. Another key belief that they draw on is karuna, compassion – so they try to reduce the suffering of others.



When people discriminate, their behaviour reflects an ignorant attitude towards other people. Buddhists believe that ignorance and craving cause people to suffer.

1.Can you explain what MLK did? [3]
2.What did they give up because of their beliefs? [4
3.What would of happe|ned if they hadn't given these things up (level 5)
4.What does they all have in common with the oth ers? (Level 6)
5.Who do you think gave up the most for their beliefs? Why? (Level 7)
6. Would you be prepared to do the same? (level 8
7. What changes would you make in society (law/ education/families/media) to end prejudice?

P2 Chapter 3: Energy
Knowledge organiser

Activate
Question • Progress • Succeed

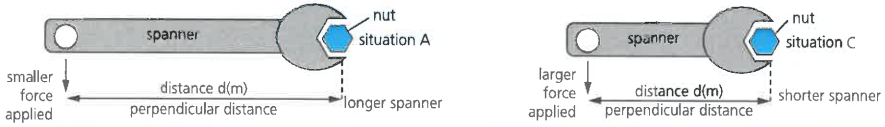
Work

- In physics, **work done** is the energy transferred when a force is used to move an object a certain distance
- Like energy, work is measured in **Joules** (J)
- Work can be done in a a range of situations e.g. lifting a book work is done against gravity, when you slide a book along a table work is done against friction
- We calculate work with the equation:

work done (J) = force (N) × distance moved (m)

- A **simple machine** makes it easier to lift things, they reduce the force needed
- A **force multiplier** uses a smaller **input force** (what you apply) to to generate a larger **output force** (what is created)
- If you increase the distance from the pivot, less input force is needed to be used for the same output force as before
- A **lever** is an example of a force multiplier, a longer lever will require a less input force than a shorter lever to produce the same output force

The physics of unscrewing a tight nut with a spanner



Radiation

- **Radiation** is a method of transferring energy without the need for particles
- An example of radiation is thermal energy being transferred from the Sun to us through space (where there are no particles)
- This type of radiation is known as **infrared radiation**, it is a type of wave just like light
- The hotter an object is the more infrared radiation it will emit (give out)
- The amount of radiation emitted and absorbed depends on the surface of the object:
  - Darker matte surfaces absorb and emit more infrared radiation
  - Shiny and smooth surfaces absorb and emit less infrared radiation, instead reflecting this
  - The amount of infrared radiation being emitted can be viewed on a **thermal imaging camera**

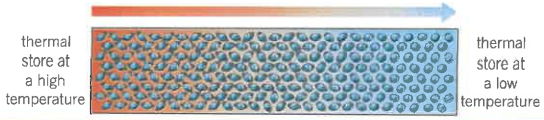
Energy and temperature

- The **temperature** of a substance is a measure of how hot or cold it is
- Temperature is measured with a **thermometer**, it has the units of degrees Celsius (°C)

- The **thermal energy** of a substance depends on the individual energy of all of the particles, it is measures in Joules (J)
- As all particles are taken into account, a bath of water at 30 °C would have more thermal energy than a cup of tea at 90 °C as there are many more particles
- The faster the particles are moving, the more thermal energy they will have
- When particles are heated they begin to move more quickly
- The energy needed to increase the temperature of a substance depends on:
  - the mass of the substance
  - what the substance is made of
  - how much you want to increase the temperature by

Conduction

- **Conduction** is the transfer of thermal energy by the vibration of particles, it cannot happen without particles
- This means that every time particles collide they transfer thermal energy
- Conduction happens effectively in solids as their particles are close together and can collide often as they vibrate around a fixed point
- Metals are also good **thermal conductors** as they contain electrons which are free to move
- In conduction the thermal energy will be transferred from an area which has a high **thermal energy store** (high temperature) to an area where there is a low thermal energy store (low temperature)
- Gases and liquids are poor conductors as their particles are spread out and so do not collide often, we call these **insulators**



Convection

- **Convection** is the transfer of thermal energy in a liquid or a gas, it cannot happen without particles
- As the particles near the heat source are heated they spread out and become less dense, this means that they will rise
- More dense particles will take their place at the bottom nearest the heat source creating a constant flow of particles
- This is known as a **convection current**
- Convection cannot happen in a solid as the particles cannot flow, they can only move around a fixed point

Key terms Make sure you can write definitions for these key terms.

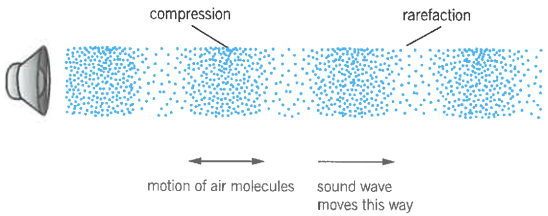
conduction convection convection current force multiplier input force insulator infrared radiation lever output force simple machine temperature thermometer thermal conductor thermal energy store thermal imaging camera work done

P2 Chapter 4: Waves
Knowledge organiser

Activate
Question • Progress • Succeed

Sound waves

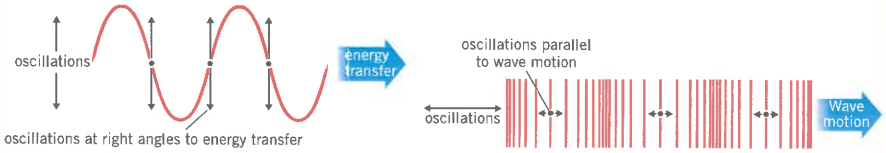
- Any **wave** transfers energy from one place to another
- Sound waves cause particles to vibrate backwards and forwards in the direction of the wave, this produces areas of high pressure (**compression**) and low pressure (**rarefaction**)
- As there are areas where the air pressure is different in a sound wave, we can call sound waves a type of **pressure wave**



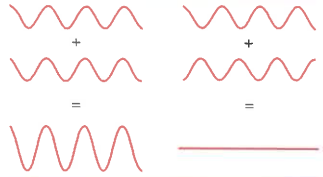
- Sound can be detected with a **microphone**, the microphone will change air pressure into a changing potential difference
- Sound can be produced with a **loudspeaker**, the changing potential difference causes changes in air pressure
- Changes in air pressure will be caused by the diaphragm of the loudspeaker vibrating and causing the movement of the air particles

Types of waves

- **Transverse waves** vibrate at 90° to the direction at which they are travelling, they move up and down as well as forward
- **Longitudinal waves** vibrate in the direction in which they are travelling



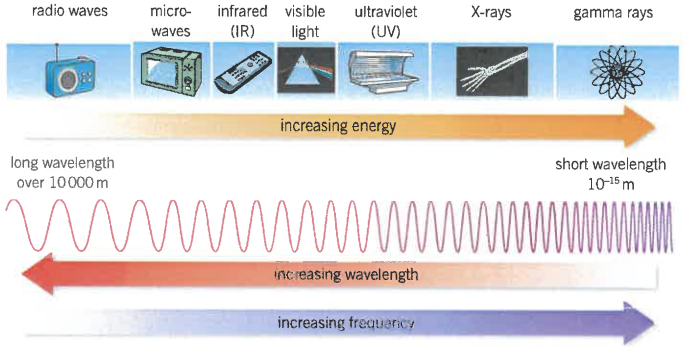
- When waves are put together they **superpose**, this means they will either add together or cancel each other out
- When the waves are in line with one another they add together, increasing the amplitude of the wave
- When the waves are not in line, they will cancel each other out, decreasing the amplitude of the wave



Ultrasound

- Humans can hear sounds with a frequency between 20–20 000 Hz.
- **ultrasound** is any sound with a frequency of higher than 20 000 Hz
- As ultrasound has a high frequency it causes the particles it interacts with to vibrate more quickly, this means that it can be used in:
  - Ultrasonic cleaning – dirt particles are 'shaken' off of objects
  - Physiotherapy – the ultrasound waves causes liquid particles in the body to move more quickly and hence get warmer

Electromagnetic spectrum

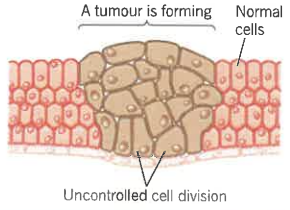


Uses of the electromagnetic spectrum

Radio waves	TV signals
Microwaves	Mobile phones
Infrared	Heating and cooking
Visible light	Photography
Ultraviolet waves	Detecting forgeries, sunbeds
X-rays	Imaging broken bones
Gamma rays	Killing cancer cells

Ionisation

- The higher the frequency of the wave, the higher the energy
- High energy waves can lead to **ionisation**, where electrons are knocked off of atoms in cells
- This can cause mutations in cells if the DNA is affected and this can lead to cancerous tumours forming
- The ionising waves in the electromagnetic spectrum are gamma, X-rays and ultraviolet rays



Key terms Make sure you can write definitions for these key terms.

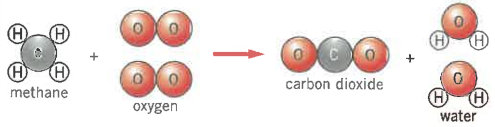
compression · electromagnetic spectrum · gamma rays · infrared · ionisation · longitudinal wave · loudspeaker · microphone · microwaves · pressure wave · radio waves · rarefaction · superpose · transverse wave · ultrasound · ultraviolet · visible light · wave · X-rays

C2 Chapter 6: Reactions
Knowledge organiser

Activate
Question • Progress • Succeed

Chemical reactions

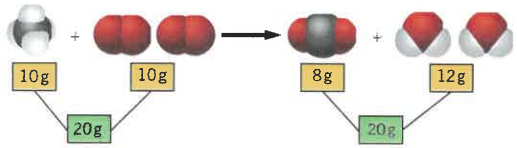
- Word equations can represent a **chemical reaction:**



- The **reactants** are on the left side of the arrow and the **products** are on the right side of the arrow
- We use an arrow instead of an equals sign as it represents that the reactants are changing into a new substance
- In a reaction, the amount of each type of atom stays the same, however they are rearranged to form a new product

Conservation of mass

- In a reaction the mass will be **conserved**, this means that the total mass of the reactants will be equal to the total mass of the products
- If it appears that some of the mass has been lost, this means that a gas has been produced and escaped, accounting for the lost mass



Balanced symbol equations show the amounts of all of the individual atoms in a reaction

- The symbols used are from the Periodic Table
- They also show:
  - Formulae of reactants and products
  - How the atoms are rearranged
  - Relative amounts of reactants and products

$$2H_2 + O_2 \rightarrow 2H_2O$$

Combustion

- **Combustion** is the burning of a **fuel** in oxygen
- A fuel is a substance which stores energy in a chemical store
- Examples of fuels include petrol, diesel, coal and hydrogen
- When a carbon based fuel undergoes combustion, it will produce water and carbon dioxide

methane + oxygen → carbon dioxide + water

- Hydrogen can also be used as a fuel, this is much better than traditional fossil fuels as it does not produce carbon dioxide:

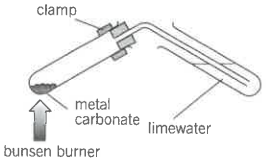
hydrogen + oxygen → water

Thermal decomposition

- A **thermal decomposition** reaction is one where the reactants are broken down (decomposition) using heat (thermal energy)
- An example of this is with metal carbonates:

zinc carbonate → zinc oxide + carbon dioxide

- We can test for this carbon dioxide by bubbling the gas through limewater, if the limewater turns cloudy, the gas is carbon dioxide



Exothermic and endothermic reactions

Exothermic reactions involve a transfer of energy from the reactants to the surroundings

- As energy is transferred to the surroundings this will show an increase in temperature
- Examples of exothermic reactions include combustion, freezing, and condensing

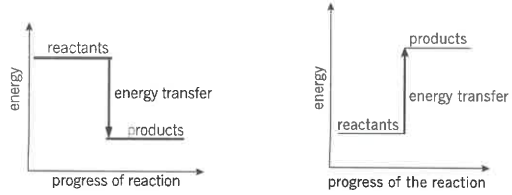
Endothermic reactions involve a transfer of energy from the surroundings to the reactants

- As energy is taken into the reactants a decrease in temperature will be shown
- Examples of endothermic reactions include thermal decomposition, melting, and boiling

Energy level diagrams

Energy level diagrams show the values of energy between the reactants and the products in a reaction

- If the energy is greater in the reactants than the products then the reaction is exothermic as energy has been given out to the surroundings
- If the energy is lower in the reactants than the products then the reaction is endothermic as energy has been taken in from the surroundings



Bond energies

- Energy must be used to break **chemical bonds**, meaning that this reaction is endothermic
- Energy is given out when chemical bonds are made, meaning that this reaction is exothermic
- To see if a reaction is endothermic or exothermic, you must find the difference in the energy needed to break and to make the bonds in the reaction
- If the energy needed to break the bonds is less than the energy given out when making the bonds, the reaction is exothermic
- If the energy needed to break the bonds is more than the energy released when making the bonds, the reaction is endothermic

Key terms Make sure you can write definitions for these key terms.

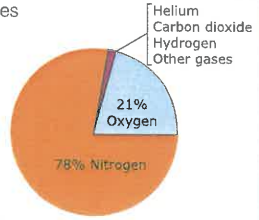
balanced symbol equation · chemical bond · chemical reaction · combustion · conserved · conservation of mass · decomposition · fuel · endothermic · energy level diagram · exothermic · products · reactants · thermal decomposition

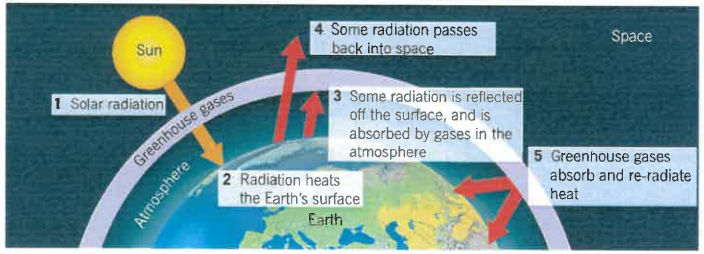
P2 Chapter 7: Earth
Knowledge organiser

Activate
Question • Progress • Succeed

The atmosphere

- The air around us all of the time is known as the **atmosphere**, it is made up of a mixture of gases
- When the Sun heats the Earth's surface, some of the radiation is absorbed and some is reflected back into space
- Some of the gases in the atmosphere absorb radiation that is about to be reflected into space, this keeps the Earth at a warmer temperature than it would be without the atmosphere, this is needed as otherwise it would be too cold for life
- The gases in the atmosphere which absorb and trap this radiation are known as **greenhouse gases**, the most commonly known greenhouse gases are carbon dioxide and methane



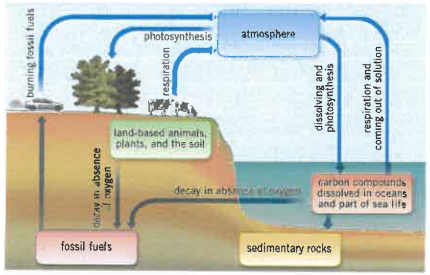


Global warming

- **Global warming** is the gradual increase in temperature of the Earth
- This is closely linked to the rise in carbon dioxide levels in the atmosphere

The carbon cycle

- The **carbon cycle** is the processes by which carbon is naturally transferred to different stores through a range of natural processes
- Carbon is released into the atmosphere through **combustion** of **fossil fuels**, and animal **respiration**
- It is then reabsorbed by plants during **photosynthesis**



Climate change

- Long term changes to weather patterns are known as **climate change**
- This can cause the ice caps to melt, leading to sea levels rising and flooding of low level land
- Graphs alone cannot confirm that humans are the cause, but the majority of scientists now believe that human activity is a very likely cause
- We can help to prevent climate change by:
  - Using renewable energy resources
  - Using cars less
  - Buying and wasting less resources

Extracting metals

- Metals are a **natural resource**, with most being found joined with other elements in compounds
- Naturally occurring metals and their compounds are known as **minerals**
- An **ore** is a naturally occurring rock which contains enough of a mineral to be worth extracting
- An example of an ore is Bauxite, which contains aluminium hydroxide

- When metals are extracted they first have to be separated from other minerals in the ore, then they need to undergo a chemical reaction to separate them from the other element that they are joined to in a compound
- If a metal is below carbon in the reactivity series, it can be extracted by reacting it with carbon in a displacement reaction
- As carbon is more reactive it will take the place of the metal in the compound, leaving the metal on its own:

  carbon + metal oxide → metal + carbon dioxide
  carbon + copper oxide → copper + carbon dioxide
- If the metal is above carbon in the reactivity series, **electrolysis** can be used, this involves separating the metal by using electricity

Reactivity series
magnesium
aluminium
carbon
zinc
iron
lead
copper

Recycling

- **Recycling** is the collecting and processing of materials that have been used so that the resources can be used again
- Recycling can have both advantages and disadvantages:

Advantages	Disadvantages
• Resources will last longer • It uses less energy than extracting new materials • It reduces waste and pollution	• Separating rubbish can be seen as a nuisance • The lorries collecting recycling produce pollution • Some materials are easier to recycle than others

Key terms Make sure you can write definitions for these key terms.

atmosphere carbon cycle climate change combustion electrolysis fossil fuel global warming greenhouse gas mineral natural resource ore photosynthesis recycling respiration

B2 Chapter 9: Ecosystems
Knowledge organiser

Activate – Question • Progress • Succeed

Respiration

- Respiration is the process in which energy is released from the molecules of food which you eat
- Respiration happens in the mitochondria of the cell
- **Aerobic respiration** involves oxygen, it is more efficient as all of the food is broken down to release energy

glucose + oxygen → carbon dioxide + water

- The glucose is transported to the cells in the blood **plasma**
- The oxygen is transported to the cells in **red blood cells**, by binding with **haemoglobin**
- Carbon dioxide is a waste product and is transported from the cells to the lungs to be exhaled

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- **Anaerobic respiration** is a type of respiration which does not use oxygen, it is used when the body cannot supply the cells with enough oxygen for aerobic respiration
- Anaerobic respiration releases less energy than aerobic respiration

glucose → lactic acid

- The **lactic acid** produced through anaerobic respiration can cause muscle cramps
- Lactic acid will build up if there is not enough oxygen present in the blood supply to break it down. This is known as an **oxygen debt**

Fermentation

- **Fermentation** is a type of anaerobic respiration which occurs in yeast
- Instead of producing lactic acid, yeast produces ethanol, which is a type of alcohol

glucose → ethanol + carbon dioxide

- This process can be used to form alcohol to drink or to allow bread and cakes to rise

Plant minerals

Plants need minerals for healthy growth, if they do not have enough of these minerals this is known as a **mineral deficiency**

Mineral	What is it used for?	What happens if there is not enough?
nitrates (contain nitrogen)	healthy growth	poor growth and older leaves yellow
phosphates (contain phosphorus)	healthy roots	poor growth, younger leaves look purple
potassium	healthy leaves and flowers	yellow leaves with deadpatches
magnesium	making chlorophyll	leaves will turn yellow

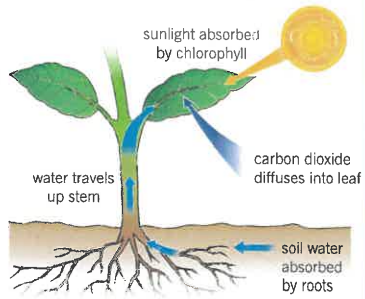
Fertilisers can be used to stop plants from suffering with mineral deficiencies

Photosynthesis

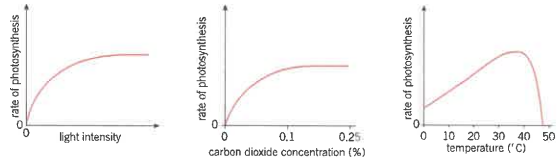
- **Photosynthesis** is the process which occurs in the chloroplasts to produce glucose using sunlight

water + carbon dioxide + sunlight → glucose + oxygen

- Any organism that can use photosynthesis to produce its own food is known as a **producer**, these are not just limited to plants but can include other organisms such as **algae**

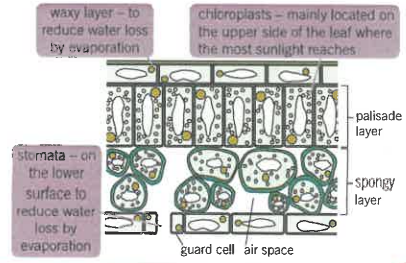


- The rate of photosynthesis can be affected by:
  - Light intensity – the higher the light intensity the higher the rate of photosynthesis up to a point
  - Carbon dioxide concentration – the higher the carbon dioxide concentration the higher the rate of photosynthesis up to a point
  - Temperature – the optimum temperature is the temperature at which photosynthesis occurs at the highest rate, before and after this the rate will be less



Leaves

- To best adapt for photosynthesis leaves have a number of adaptations
- They are thin to allow the most light through
- There is a lot of **chlorophyll** to absorb light
- They have a large surface area to absorb as much light as possible



Key terms

Make sure you can write definitions for these key terms.

aerobic respiration · algae · anaerobic respiration · chlorophyll · mineral deficiency · fermentation · fertiliser · haemoglobin · lactic acid · magnesium · nitrates · oxygen debt · phosphates · photosynthesis · plasma · potassium · producer · red blood cells

B2 Chapter 10: Genes
Knowledge organiser

Activate
Question > Progress > Succeed

Natural selection

- Scientists believe that the organisms which we see on Earth today have gradually developed over millions of years, this is known as **evolution**
- Charles Darwin came up with the concept of **natural selection**, he said that only the best adapted animals will survive to pass on their **genes**, weaker animals will die out

Organisms show variation in characteristics caused by their genes → Organisms with the best adaptations survive and reproduce, weaker organisms die out and do not pass on their genes → Genes from the successful organisms are passed onto the next generation, passing on their successful characteristics → Over a long period of time the best adaptations continue to be passed on which can lead to a new species being formed

- One example of natural selection can be seen in giraffes, only the giraffes with the longest necks would be able to eat from trees, the ones with shorter necks would not be able to eat and die out
- This would mean that only the gene for long necks would be passed on, leading to all giraffes having long necks

Extinction

- A species will become **extinct** when all of a species die out
- The **fossil record** shows us that animals have existed in the past which have now become extinct
- Extinction can be caused by:
  - Changes to the environment
  - Destruction of habitat
  - New diseases
  - Introduction of new predators
  - Increased **competition**
- When a species becomes extinct, the variety of species within an ecosystem is reduced, this is also known as a reduction in **biodiversity**
- The more diverse a **population** is, the more likely they are to survive environmental changes

Punnet squares

Possible alleles from father

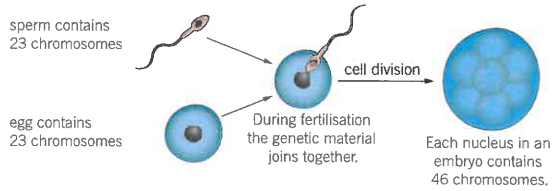
Possible alleles from mother	B (dominant allele for browneyes)	b (recessive allele for blue eyes)
b (recessive allele for blue eyes)	Bb Offspring will have brown eyes as B is dominant	bb Offspring will have blue eyes as both alleles are recessive
b (recessive allele for blue eyes)	Bb Offspring will have brown eyes as B is dominant	bb Offspring will have blue eyes as both alleles are recessive

Genetic modification

- **Genetic modification** is the process which scientists can use in order to alter the genes of an organism
- Examples of this include altering cotton to produce higher yields, altering bacteria genes to produce medicines and altering crops to produce their own insecticides

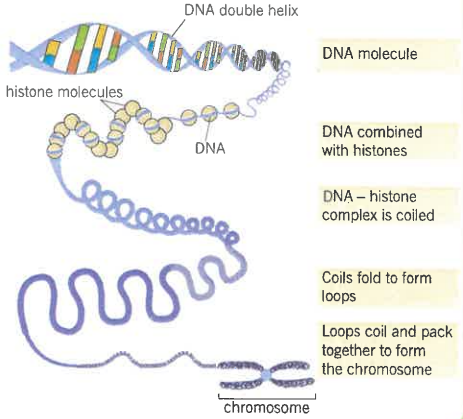
Inheritance

- **Characteristics** are passed along from parents to their offspring
- Half of the genetic information comes from each parent, this is passed on through the sex cells in the process of fertilisation



- **DNA** is the material which contains all of this genetic information

DNA – in the shape of a double helix
↓
Genes – a section of DNA which hold the information for a particular characteristic
↓
Chromosomes – long strands of DNA which hold many genes, humans have 46 of these in the nucleus of cells



Genetics

- For every characteristic an organism will have two **alleles**, this is two different genes which can code for the same characteristic, one is inherited from each parent
- **Dominant** alleles will cause the characteristic to be displayed even if they are with another allele, this is represented by a capital letter
- **Recessive** alleles will not be displayed as characteristics unless there are two of the same allele, they are the characteristic least likely to be shown, this is represented by a small letter
- We can predict the inheritance of characteristics using a **Punnet square**

Key terms Make sure you can write definitions for these key terms.

allele biodiversity characteristics chromosome competition DNA dominant evolution extinct fossil record gene genetic modification mutation natural selection population punnet square Punnet square recessive