

Name and Tutor group:



Year 8 Knowledge Organiser

Term 6

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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.

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.

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?

Meeting Your Work - Meeting Expectations

NYM

NOT YET MET = Yellow Dot

MT

MET = Green Dot

EX

EXCEEDING = Blue Dot



Keywords

Embellish

Surreal

Complementary Colours

Contour lines

To make beautiful with ornamentation

Bizarre unusual strange. Things combined in a strange, unreal and dreamlike way.

Two colours that are on opposite sides of the colour wheel. This combination provides a high contrast and high impact colour combination.

Following the edges of shapes.

[Video to Watch:](#)

[Hundertwasser and his Dreamscapes](#)

My Business - Knowledge Organiser

Types of logo

1. Strictly graphical symbol like the Nike "swish" or the McDonalds "Golden arch"



House style

House style means consistent use of font, logos, colour scheme, and layout on all your documents

Your theme park should have a recognisable style on your brochure, map, tickets, posters, etc

Businesses use consistent house style so you recognise their documents and advertising



2. A font based logo like Coca Cola, DELL, CNN, Sony or Nokia

3. Combination of font and graphics. This is the most common type of logo designed by and most often employed by small to mid size companies.



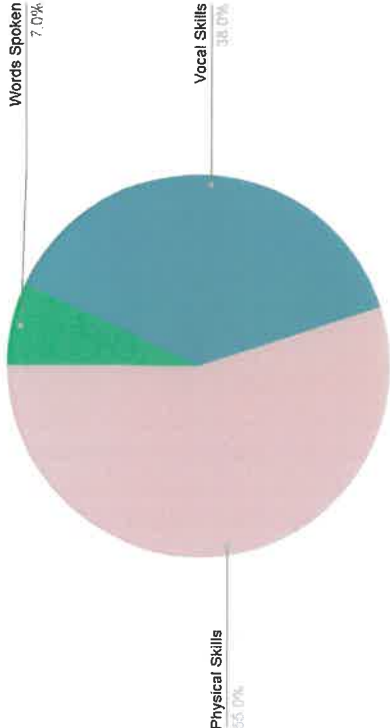
Colour palette

Colours help set a mood - for instance consider these colours:

- Orange: Expresses energy, warmth, attention grabbing
- Blue: Seriousness, stability, trust
- Black: Sophistication, technology, power
- Green: Spring, generosity, health

Technique	Definition
Seven Levels of Tension	Different levels of physical or emotional tension an actor can use, from relaxed to very intense, to show different feelings or actions
Clocking the Audience	Paying attention to how the audience is reacting or where they are looking during a performance.
Major Focus	The main thing the actor focuses on while performing in a mask, which drives the character's actions or emotions.
Minor Focus	Smaller details or secondary things the actor focuses on that support the main focus and add depth to the performance.
Suspension of Disbelief	The audience choosing to believe in the fictional world of a performance, even if it's unrealistic or fantastical.
Hot-seating	When an actor stays in character and answers questions from others to learn more about their character.

Communication



Year 8 – Term 6 - Mask



Rules of wearing mask

- ▶ Never speak through a full face Mask
- ▶ Always turn away from the audience when putting a mask on
- ▶ Always aim to face the audience when wearing a Mask
- ▶ Don't wear the Mask on your head like a hat
- ▶ Don't leave a Mask on the floor to be trod on.
- ▶ Only place the mask down face up.
- ▶ Do not touch the mask when wearing it



Identify which rules are about creating an illusion and which are health and safety?

14

Performance Skills		Techniques	Production Elements	Other
Vocal Skills	Physical Skills			
Tone Pitch Pace Projection Volume Emphasis Pause Accent Articulation/Diction	Body Language Gesture Facial Expressions Eye Contact Movement Posture	Major Focus Minor Focus Mime Freeze Frame Hot Seating	Staging	Rehearsal Performance Blocking Directing Devising Audience Awareness

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, seeds, 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. They 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	Anything from an animal, honey
	Vegetarian	Don't want to eat animals	Meat and fish products
	Pescatarian	- Ethical reasons - Cost of meat - Texture of meat	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

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

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

Mechanical Devices

Motion

LINEAR MOTION

ROTARY MOTION

RECIPROCATING MOTION

OSCILLATING MOTION

Linkages

Simple Motion Linkage

Parallel Motion Linkage

Bell Crank Linkage

Forces

compression

tension

bending

torsion

shear

Pulley

Cams

Types of cams

Different shaped cams are used for different tasks:

Eccentric cam

Pear cam

Small cam

Heart-shaped cam

What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Keywords

Research
Design
Evaluation
Wood joint
Mechanical
Pulley
Linkage
Lever
Motion
Force

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KS3 YEAR 8

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 / beetroots
- 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 Fibre

- Polyester
- Acrylic
- Nylon



Fabric Construction:

- Woven
- Knitted
- Bonded



What is

good

design?

- Clear ideas
- Annotations
- Measurements
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- Balance

Maths in DT:

- Multiplication
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Elements that make up Islamic Design:

- Calligraphy
- Floral
- Geometry

Keywords

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

DT TEXTILES

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 patterns

Fabric paint / pens



Paint / pens which can be applied to fabrics

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



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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?

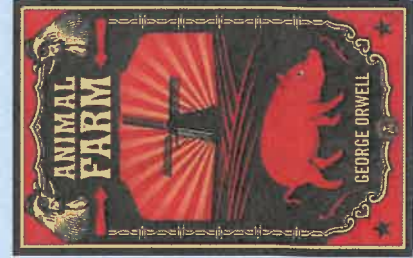
LOOK AT THE TEXT AND TECHNIQUES
EVIDENCE

WHY?

MEANS? SUGGESTS?
ANALYSIS

MAKE DEVELOPMENTS
LINKS

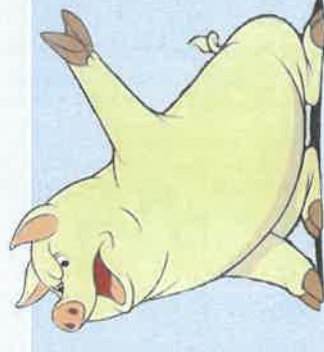
KEY TECHNIQUES		
Narrative voice	Semantic field	Imagery
Sibilance	Tension	Verb
Pathetic fallacy	Alliteration	Adjective
Contrast	Figurative	Personification
Juxtaposition	Symbolism	Motif



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

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 Joneses' 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	The 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.

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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

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Tackling water stress 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.	Stop wasting it
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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.

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Take it from the sea
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Global Water Use

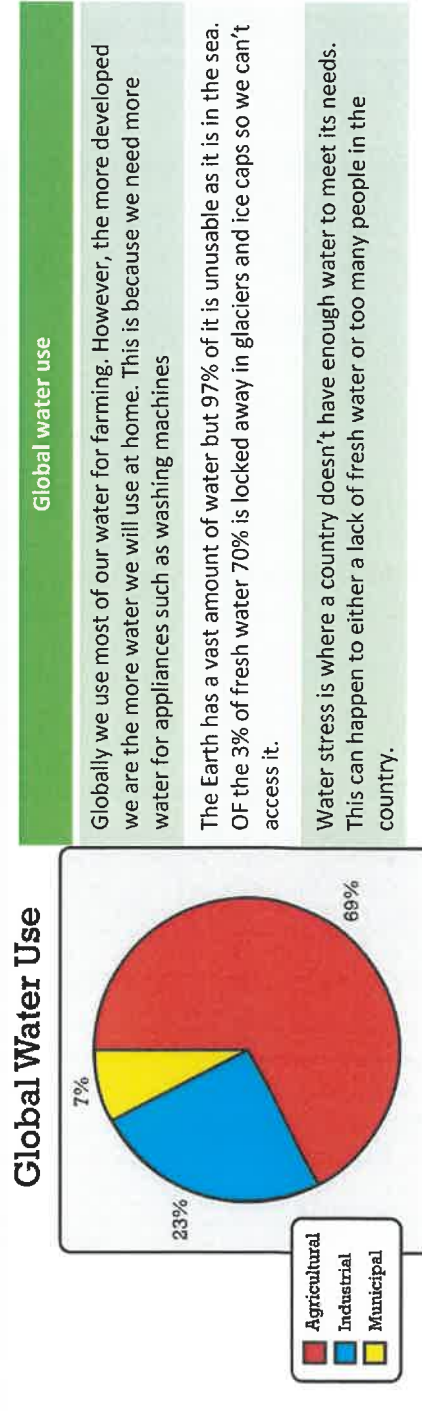
Category	Percentage
Agricultural	69%
Industrial	23%
Municipal	7%

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.



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The Ogallala

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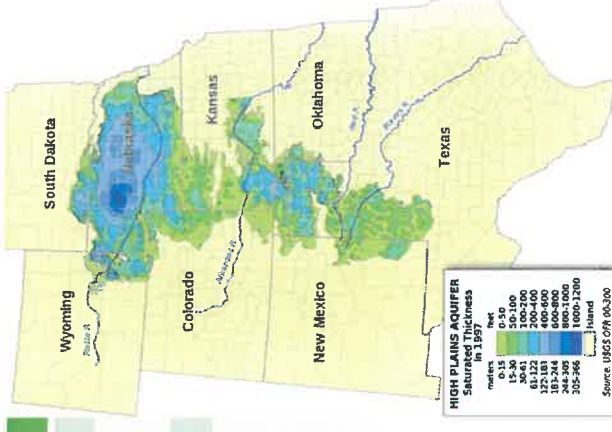
An aquifer is an underground rock that stores water This can happen if the rock is permeable.

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.

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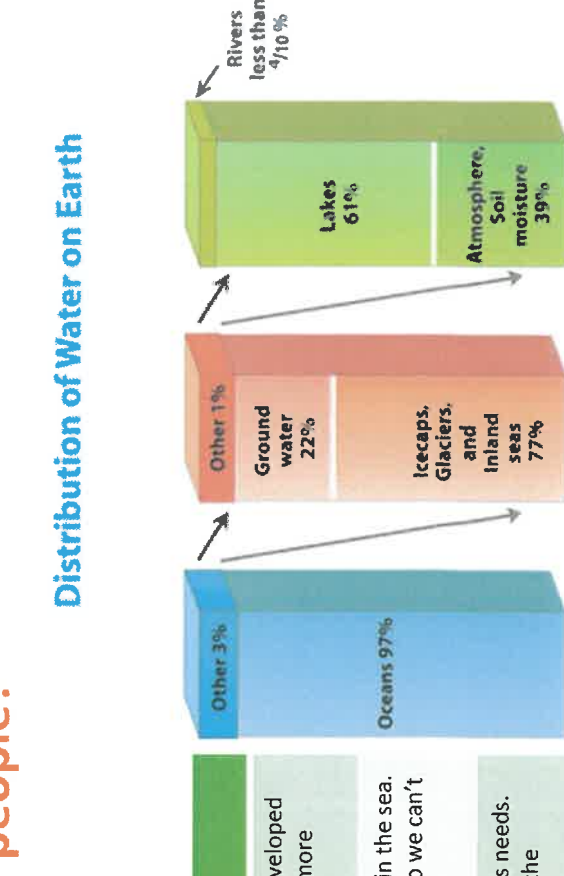
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Yr8 Geog: Can we provide resources for 9 billion people?

Distribution of Water on Earth



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.

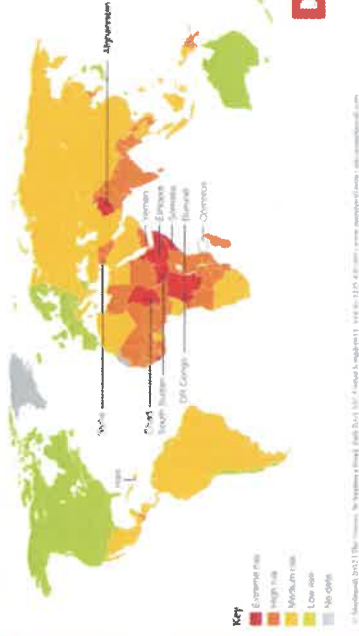
Physical causes of food insecurity

- Pests and disease destroys crops
- Not enough rainfall to grow crops
- Climate change reduces rainfall

Human causes of food insecurity

- 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.

Food Security Risk Index 2013



Drought Resistant Crops

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



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.

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 over.

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

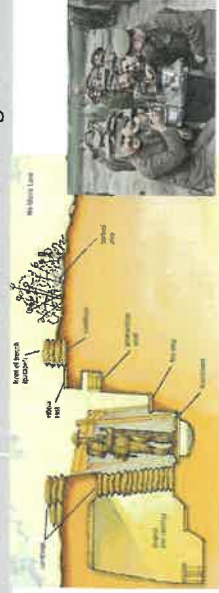
Technology has meant that we can now develop crops which can be grown with minimal water – perfect for countries that get a lot of drought.



Enquiry: Why was WW1 called 'The Great War'?

Outline: When war broke out between two alliances in Europe in 1914, the conflict became a world war due to the empires that the countries owned around the world. Millions of people were affected by a war which has been called the first industrialised war due to the new technology developed to win.

Date	Events	Description
1882 and 1907	Triple Alliance and Triple Entente	Germany, Austro-Hungary and Italy formed the Triple Alliance in 1882 and France, Russia and Britain formed the Triple Entente in 1907. These were defensive to protect each other from war.
1914	WW1 began	Archduke Franz Ferdinand from Austria was assassinated by a Serbian in Sarajevo. This became the excuse used to launch the war in August.
1916	Battle of the Somme and Battle of Jutland	The Somme was a catastrophic battle for Britain. Jutland saw a naval stalemate between Germany and Britain.
1917	Battle of Passchendaele	Huge loss of life, mainly due to crucial tactical errors in the battle.
	Russia left the war and the USA joined.	Russia's revolution led to them making peace with Germany but the USA joined on the Triple Entente side which was crucial to their victory.
1918	WW1 ended	Germany and its allies surrendered in November 1918 and an armistice was signed.



History – Year 8 Knowledge Organiser Topic 5

Key individuals



Walter Tull. First Black person to be made a British army officer. He played football for Tottenham before the war. Tull died in the war in 1918.



Edith Cavell Worked as a nurse who helped soldiers from both sides. Was arrested by Germany and executed in 1915.



Wilfred Owen. A soldier who was famous for his poetry about the war. Owen attended a hospital to treat his PTSD. He died in the war in 1918.



The Red Baron. A German fighter pilot who was respected by British pilots. He had over 80 air victories but died in 1918.



Furthering learning
Want to find out more about the First World War?



Key vocabulary:

Alliance system: groups of countries who supported each other in case there was a war.

Arms race: competition between countries to have the most weapons.

Assassination: murder of an important political person.

Conscientious objector: someone who is allowed to avoid fighting and undertakes non-violent work.

Conscription: being forced to join the armed forces.

Empire: territories which are controlled by another more powerful country.

Encirclement: The Triple Alliance feared being surrounded by its enemies in the Triple Entente.

Escalation: before the war broke out, the situation was becoming intense and tension was growing.

Nationalism: a strong attachment to your country where you actively dislike other countries.

No man's land: land between the two side's trenches. Very dangerous to cross.

Recruitment: campaign to encourage men to join the army which often used propaganda.

Remembrance: the act of remembering the past so that it is not forgotten.

Shell shock: the name given to PTSD which was caused by trench warfare,

Stalemate: when neither side is winning

Tank: invented during the war to try and solve the problem of crossing no man's land.

Trench foot: medical problem where constant wet feet led to infection.

Trench warfare: where soldiers dig trenches and attack from these.



Prior learning?

Medieval – 19th century warfare
Role of technology in war

Enquiry: Why was WW1 called 'The Great War'?

Historical skill focus: using evidence

- What is the nature, origin and purpose of a source?
- What makes a source useful?

What to focus on

What is the **NATURE** of the source? Does this make it useful?

What is the **ORIGIN** of the source? Does this make it useful?

What is the **PURPOSE** of the source? Does this make it useful?

Starting sentences

Source A is useful because...

This is shown by...

The source is also useful due to its purpose which was to...



Point = One way the source is useful is...

Evidence = This is shown by the nature of the source...

Explain = This is useful because...

History – Year 8

Knowledge Organiser
Topic 5

British
government
poster made
in 1915

Section B: using evidence

Write at least two paragraphs to answer this question:

How useful is Source A to tell a historian about recruitment for the First World War?



Developing

I can make inferences using a source.

I can ask questions about sources such as who made the source or when it was made

Secure

I can explain how a source can be useful/not useful in a PEE paragraph.

I am starting to think about the nature, origin and purpose of the source and what its impact could be.

Exceeding

I can explain how useful a source is and then make a judgement based on this information. I can write this in a PEEL paragraph.
I can accurately comment on the purpose of a source.

Europe in 1914



Nature = type of source like a painting or letter
Origin = date made and who made it
Purpose = why it was made = motivate/justify/persuade

Summative assessment - preparation

History – Year 8 Knowledge Organiser Topic 5

Historical skill focus: significance

- What makes a person/event significant?
- How can we judge significance?



Section B: Can you explain significance?

You could **write one or two paragraphs** to explain.

- How significant was the trade in enslaved people?

What to focus on:

One or two reasons why an event was significant.

Think about what makes it important; what happened? Who did it impact?

Think about the impact on them and the impact on others.

Starting sentences

One reason why this were significant was...

This makes it significant because...



Developing

I can explain a reason for the significance of individuals in a PEE paragraph.

Secure

I can explain more than one reason for the significance of individuals in a PEE paragraph.

I am beginning to compare different types of significance.

Exceeding

I can explain and compare several reasons for significance in a PEE paragraph

I am beginning to categorise for short and long term significance.

I am beginning to judge on which is most significant area.

Point = One reason for the slave trade's significance is...
Evidence = This is shown by when they...
Explain = This is significant because...

Preparation for a summative assessment

Historical skill focus: interpretations

- What does an interpretation tell us
- How convincing is the interpretation?



History – Year 8
Knowledge
Organiser
Topic 5

Section B: Using interpretations

How convincing is Interpretation A to a historian studying the actions of the suffragettes?

Make sure you use your own knowledge to show why the Interpretation is or isn't convincing. You can also consider the historian who has written the interpretation.

Starting sentences

What to focus on:

What does the interpretation show? Does this fit your own knowledge?
What is the historian's opinion? Is he/she right?
When was the historian writing – what does this tell us?

Do any of the above make the interpretation convincing?

Interpretation A is convincing because...
This is shown by...
The interpretation is also convincing due to its purpose which was to...



Point = This interpretation is convincing because...
Evidence = This is shown by...
Explain = This is convincing because...

Professor Simon Schama. History of Britain. 2000

One of the most militant of the suffragettes, Emily Wilding Davison was constantly coming up with new tactics to take the woman's guerrilla war into the heartland of the respectable classes. First she was caught standing by the Parliament Square postbox holding a paraffin-soaked piece of linen, about to light it. After a spell in prison she then organized an attack on Lloyd George's new house at Walton-on-the-Hill in Surrey which succeeded in destroying half of it, although she was not caught in the act. And, finally, and most famously, Emily achieved her evident wish for martyrdom by throwing herself under the first horse to come into sight at the Epsom Derby in 1913. It just so happened that it was the king's horse that was in the lead when she launched herself from the rails.

Developing

I can identify interpretations.
I can understand historians' methods.
I can use an interpretation to understand and describe an event or individual

Secure

I can decide whether an interpretation is convincing with some evidence.
I can write a PEE paragraph.
I can begin to explain the purpose of an interpretation.

Exceeding

I can decide whether an interpretation is convincing with detailed evidence.
I can write a PEE paragraph.
I can explain the purpose of an interpretation.
I can begin to think about why interpretations change.

YEAR 8 - REASONING WITH DATA...

The data handling cycle

@whisto_maths

What do I need to be able to do?

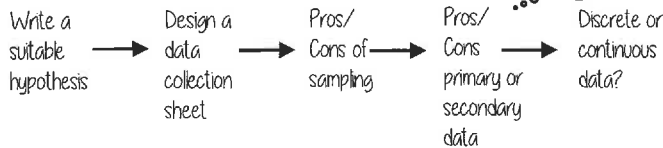
By the end of this unit you should be able to:

- Set up a statistical enquiry
- Design and criticise questionnaires
- Draw and interpret multiple bar charts
- Draw and interpret line graphs
- Represent and interpret grouped quantitative data
- Find and interpret the range
- Compare distributions

Keywords

- Hypothesis:** an idea or question you want to test
Sampling: the group of things you want to use to check your hypothesis
Primary Data: data you collect yourself
Secondary Data: data you source from elsewhere e.g. the internet/ newspapers/ local statistics
Discrete Data: numerical data that can only take set values
Continuous Data: numerical data that has an infinite number of values (often seen with height, distance, time)
Spread: the distance/ how spread out/ variation of data
Average: a measure of central tendency – or the typical value of all the data together
Proportion: numerical relationship that compares two things

Set up a statistical enquiry



Features of a data collection sheet

Data Title	Tally	Frequency
Grouped or ungrouped categories		Total number of that group observed

Design and criticise a questionnaire

The Question - be clear with the question - don't be too leading/ judgemental

e.g. How much pocket money do you get a week?

Responses - do you want closed or open responses? - do any options overlap? - Have you an option for all responses?

Zero option → ☐ £0 ☐ £0.01 - £2 ☐ £2.01 - £4 ☐ more than £4 → More option

NOTE: For responses about continuous data include inequalities $< x \leq$

Pictograms, bar and line charts

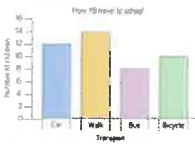
Pictogram

Language	Frequency
French	4
Spanish	3
German	1

● = 4 people

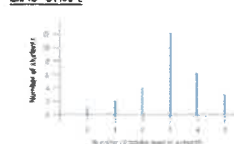
- Need to remember a key
- Visually able to identify mode

Bar Chart



- Gaps between the bars
- Clearly labelled axes
- Scale for the axes
- Title for the bar chart
- Discrete Data

Line Chart



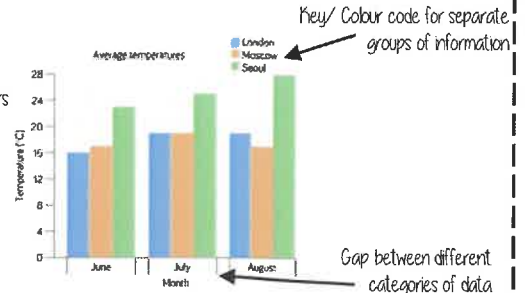
- Gaps between the lines
- Clearly labelled axes
- Scale for the axes
- Discrete Data

Represents quantitative data

Multiple Bar chart

Compares multiple groups of data

- Clearly labelled axes
- Scale for axes
- Comparable data bars drawn next to each other



Gap between different categories of data

Draw and interpret Pie Charts

Remember a circle has 360°

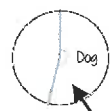
Type of pet	Dog	Cat	Hamster
Frequency	32	25	3

There were 60 people asked in this survey (Total frequency)

$\frac{32}{60}$ "32 out of 60 people had a dog"

This fraction of the 360 degrees represents dogs

$\frac{32}{60} \times 360 = 192^\circ$



Use a protractor to draw This is 192°

Multiple method
 As 60 goes into 360 - 6 times
 Each frequency can be multiplied by 6 to find the degrees (proportion of 360)

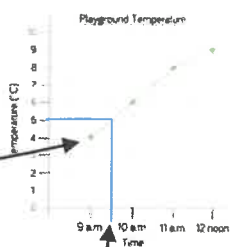
Represents quantitative, discrete data

Draw and interpret line graphs

- Commonly used to show changing over time
- The points are the recorded information and the lines join the points

Line graphs do not need to start from 0

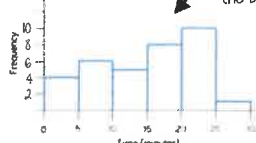
More than one piece of data can be plotted on the same graph to compare data



It is possible to make estimates from the line e.g. temperature at 9.30 am is 5°C

Grouped quantitative data

Time (minutes)	Frequency
$0 \leq t < 5$	4
$5 \leq t < 10$	6
$10 \leq t < 15$	5
$15 \leq t < 20$	8
$20 \leq t < 25$	10
$25 \leq t < 30$	1



This is a frequency diagram There are no gaps between the bars

Grouping the data is useful if there is a large spread of data to begin with

"More than or equal to 25 and less than 30 minutes"

The use of inequalities shows that this will be a frequency diagram

Find and interpret the range

The range is a measure of spread

A smaller range means there is less variation in the results - it is more consistent data

A range of 0 means all the data is the same value

Shop 1 has the smallest range - this indicates it has a more consistent flow of customers each week

Difference between the biggest and smallest values



Range of customers = $25 - 22 = 3$ (Shop 1)

YEAR 8 - REASONING WITH DATA...

Measures of location

@whisto_maths

What do I need to be able to do?

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

- Understand and use mean, median and mode
- Choose the most appropriate average
- Identify outliers
- Compare distributions using averages and range

Keywords

Spread: the distance/ how spread out/ variation of data

Average: a measure of central tendency – or the typical value of all the data together

Total: all the data added together

Frequency: the number of times the data values occur

Represent: something that shows the value of another

Outlier: a value that stands apart from the data set

Consistent: a set of data that is similar and doesn't change very much

Mean, Median, Mode

The Mean

A measure of average to find the central tendency... a typical value that represents the data

24, 8, 4, 11, 8

Find the sum of the data (add the values) 55

Divide the overall total by how many pieces of data you have $55 \div 5$

Mean = 11

The Median

The value in the center (in the middle) of the data

24, 8, 4, 11, 8

Put the data in order

4, 8, 8, 11, 24

Find the value in the middle

4, 8, 8, 11, 24

Median = 8

NOTE: If there is no single middle value find the mean of the two numbers left

The Mode (The modal value)

This is the number OR the item that occurs the most (it does not have to be numerical)

24, 8, 4, 11, 8

This can still be easier if the data is ordered first

4, 8, 8, 11, 24

Mode = 8

Choosing the appropriate average

The average should be a representative of the data set – so it should be compared to the set as a whole – to check if it is an appropriate average

Here are the weekly wages of a small firm

£240	£240	£240	£240	£240
£260	£260	£300	£350	£700

Which average best represents the weekly wage?

The Mean = £307

The Median = £250

The Mode = £240

Put the data back into context

Mean/Median – too high (most of this company earn £240)

Mode is the best average that represents this wage

It is likely that the salaries above £240 are more senior staff members – their salary doesn't represent the average weekly wage of the majority of employers

Identify outliers

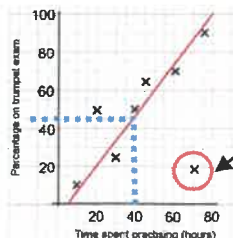
Outliers are values that stand well apart from the rest of the data

Outliers can have a big impact on range and mean. They have less impact on the median and the mode

Sometimes it is best to not use an outlier in calculations

Height in cm
152 150 142 158 182 151 153 149 156 160 151 144

Where an outlier is identified try to give it some context. This is likely to be a taller member of the group. Could be an older student or a teacher?



Outliers can also be identified graphically e.g. on scatter graphs

Comparing distributions

Comparisons should include a statement of average and central tendency, as well as a statement about spread and consistency

Here are the number of runs scored last month by Lucy and James in cricket matches

Lucy: 45, 32, 37, 41, 48, 35

James: 60, 90, 41, 23, 14, 23

Lucy

Mean: 39.6 (1dp), Median: 38, Mode: no mode, Range: 16

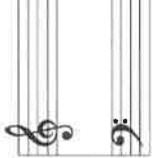
James

Mean: 41.8 (1dp), Median: 32, Mode: 23, Range: 76

James has two extreme values that have a big impact on the range

"James is less consistent than Lucy because his scores have a greater range. Lucy performed better on average because her scores have a similar mean and a higher median"

1. Rhythm	
Writing music down so players can easily read the pitch and duration of the notes they are supposed to play.	
1	 Crotchet = 1 Beat
2	 Quaver = ½ Beat
3	 Minim = 2 Beats
4	 Semibreve = 4 Beats
5	 Rest = Rest for 1 beat (Crotchet rest)
6	 Rest = Rest ½ beat (Quaver rest)

2. Staves	
1	 Stave/ Staff = The Staff is the five lines which the notes are written on. Between these five lines there are four spaces. There are two Staves (known as The Grand Staff) one above the other. They are sometimes also referred to as the Staff, depending on where you are in the world!
4	 Treble Clef = A symbol that is placed on every line of music to show the notes which will be sung or played by voices and instruments that can achieve higher notes.
5	 Bass Clef = Signifies low to medium pitches being read on the staff.

3. DR SMITH	
In music we use DR SMITH to help us remember terms of music.	
1	D ynamics How loud or quiet you play the music.
2	R hythm Is a pattern on sounds of different lengths and what makes music move and flow.
3	S tructure Gives shape and balance to music.
4	M elody The main tune of the piece.
5	I nstrumentation  A combination of instruments used to perform a piece of music. - Strings (bowed) - Woodwind - Brass - Percussion - Keyboard - Guitar - Voice
6	T exture Layers of sound in a piece of music.
7	T empo How fast or slow the music is.
8	T onality Major or minor scale.
9	H armony A multiple of pitches being played at the same time.

<https://www.youtube.com/watch?v=bHTstUefUq0>
Practise your rhythms with this link.

3. Dynamics	
Dynamics can make the listener feel different emotions. In music you would use Italian words to describe the dynamics.	
1	<i>pp</i> Pianissimo = Very soft & very quiet
2	<i>p</i> Piano = Soft & Quiet
3	<i>mp</i> Mezzo Piano = Medium soft & quiet
4	<i>mf</i> Mezzo Forte = Medium loud
5	<i>f</i> Forte = Loud
6	<i>ff</i> Fortissimo – Very loud
Key Vocabulary	
1	Pulse The heartbeat of the rhythm/music that you hear.
2	Composition An original piece or work of music.
3	Unison Two or more people play or sing the same pitch or in octaves at the same time.
4	Polyrhythm When two or more rhythms with different pulses are heard together.
5	Graphic score  Representation of music through the use of visual symbols.
6	Call and Response The leader sings a line (the call) and is answered by a chorus (the response).
7	Solo An individual performance.

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:

- Easy – **Green**
- Medium – **Green & Orange**
- 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 yourself'



you love

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 happened if they hadn't given the things up (level 5)
4. What does they all have in common with the others? (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

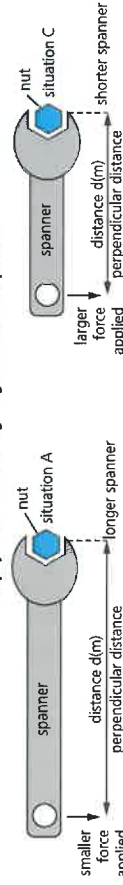
Work

- 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 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:

$$\text{work done (J)} = \text{force (N)} \times \text{distance moved (m)}$$

- 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 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



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 ($^{\circ}\text{C}$)
- The **thermal energy** of a substance depends on the individual energy of all of the particles, it is measured 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

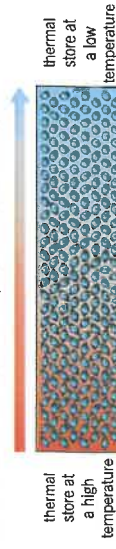
Radiation

- 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**



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				

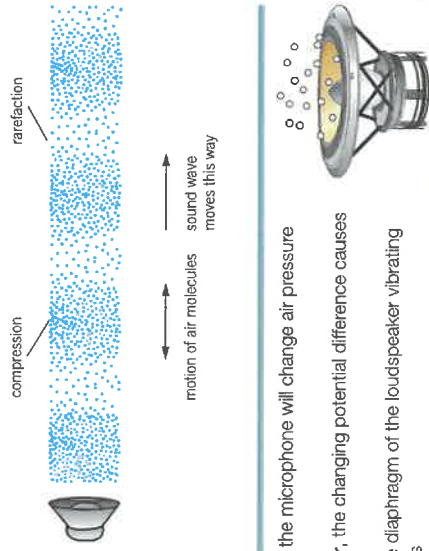
P2 Chapter 4: Waves

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

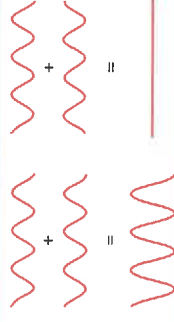


Types of waves

- 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



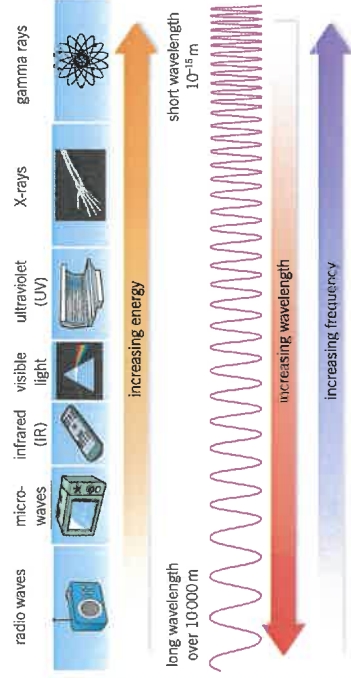
- When waves are put together they **superpose**, this means they will either add together or cancel each other out
- When the waves are in line with one another they add together, increasing the amplitude of the wave
- When the waves are not in line, they will cancel each other out, decreasing the amplitude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

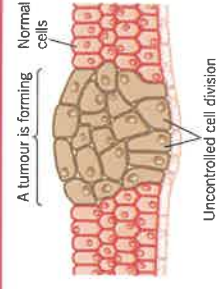


Uses of the electromagnetic spectrum

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 pressure wave electromagnetic spectrum radio waves rarefaction superpose transverse wave ionisation longitudinal wave loudspeaker microphone wave X-rays microwaves

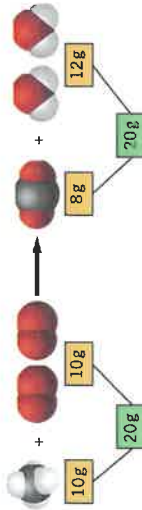
Chemical reactions

- 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

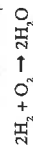
Conservation of mass

- 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

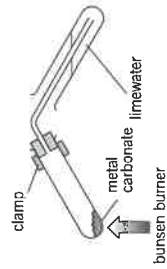


Combustion

- 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 $\rightarrow$ 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 $\rightarrow$ water

Thermal decomposition

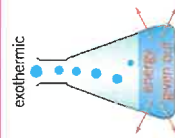
- A **thermal decomposition** reaction is one where the reactants are broken down (decomposition) using heat (thermal energy)
- An example of this is with metal carbonates:
 zinc carbonate $\rightarrow$ zinc oxide + carbon dioxide
- We can test for this carbon dioxide by bubbling the gas through limewater, if the limewater turns cloudy, the gas is carbon dioxide



Exothermic and endothermic reactions

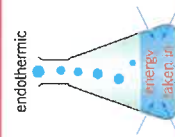
Exothermic reactions involve a transfer of energy from the reactants to the surroundings

- 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

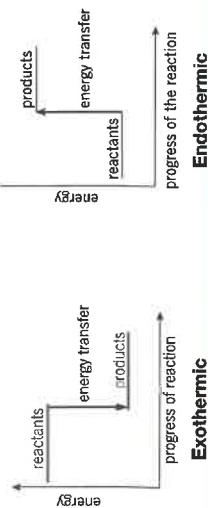
- As energy is taken into the reactants a decrease in temperature will be shown
- Examples of endothermic reactions include thermal decomposition, melting, and boiling



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 reaction chemical bond energy level diagram exothermic combustion conserved reactants products conservation of mass decomposition fuel endothermic 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

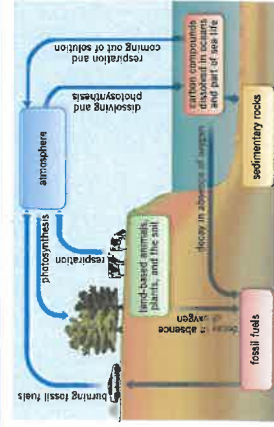


Global warming

- 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**



Key terms

Make sure you can write definitions for these key terms.

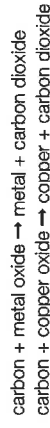
atmosphere carbon cycle carbon dioxide climate change combustion fossil fuels greenhouse gas global warming mineral natural resource ore photosynthesis recycling respiration

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:



- 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

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

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
- 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



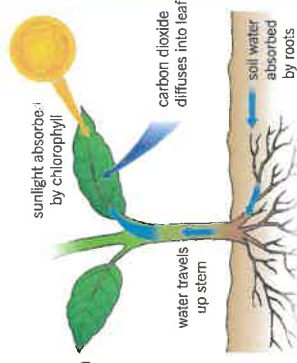
Make sure you can write definitions for these key terms.

aerobic respiration algae anaerobic respiration chlorophyll mineral deficiency photosynthesis plasma fermentation fertiliser haemoglobin lactic acid magnesium

nitrites oxygen debt phosphates photosynthesis photosynthesis producer red blood cells

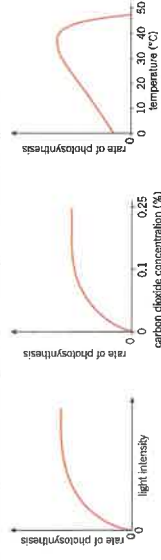
Photosynthesis

- 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**



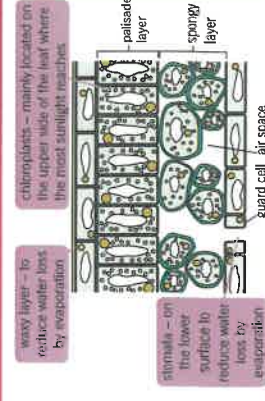
The rate of photosynthesis can be affected by:

- 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



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 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

Punnett squares

Possible alleles from father

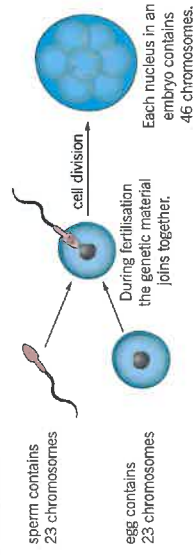
Possible alleles from mother	B (dominant allele for brown eyes)	b (recessive allele for blue eyes)
B (dominant allele for brown eyes)	BB Offspring will have brown eyes as B is dominant	Bb Offspring will have brown eyes as B is dominant
b (recessive allele for blue eyes)	Bb Offspring will have brown eyes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

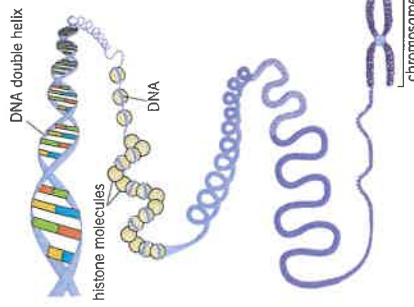
- Characteristics** are passed along from parents to their offspring
- Half of the genetic information comes from each parent, this is passed on through the sex cells in the process of fertilisation



- 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 **Punnett 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 inheritance mutation natural selection population Punnett square recessive