Year 9 Art and Design Spring Term Knowledge Organiser

Key Vocabulary:		
1	**The Formal Elements of Art**	The formal elements of art are used to make a piece of artwork. These are **line**, **tone**, **texture**, **shape**, **pattern** and **colour**. They are often used together, and how they are organised in a piece of art determines what the finished piece will look like.
2	**scale**	The scale of something is its size. To scale something is to enlarge it. To scale down is to do a smaller version and reduce it.
3	**horizon line**	The horizon line in a perspective drawing is a horizontal line drawn across the picture. It can be a temporary pencil line or morph into a permanent line where sky and land meet. It is always at eye level and its placement determines where we seem to be looking from, whether that is from a high place or from close to the ground.
4	**foreground**	The foreground refers to the area closest to the viewer, which will almost always be in the lower section of your picture.
5	**middleground**	The middleground is the space naturally occurring between the foreground and the background.
6	**background**	The background is the space naturally occurring in the distance and called the background.
7	**acrylic paint**	Paint that can be used thickly like oil paint and thinly for transparent watercolour style washes. Slightly glossy finish, and waterproof when dry.
8	**mono-print**	A printmaking process where paper is laid on an inked surface and drawn on. Each print is a one-off.
9	**mixed media**	Mixed media refers to a visual art form that combines a variety of media in a single piece of artwork.

Art Movements:		
10	**Romanticism**	A European art movement of the late eighteenth to mid-nineteenth century. J.M.W Turner painted landscapes with interest in light and colour.
11	**Impressionism**	A French art movement from around 1880. Mostly painted out of doors, impressionist artists aimed to capture the fleeting effects of colour in a moment of time. Claude Monet, Pierre-Auguste Renoir, and Camille Pissarro are some artists in the period.
12	**Post - Impressionism**	Originally this referred to a group of late nineteenth-century painters, including Paul Cezanne and Vincent Van Gogh. They took ideas of Impressionism further to explore colour.
14	**Pointillism**	Georges Seurat and Paul Signac painted scenes in the 1880s using tiny dabs of pure colour that appear to blend together and form different colours when looked at from a distance.
16	**Fauvism**	A style adopted by artists around 1905-10. Landscapes were painted with bright colours and loose brushstrokes. Andre Derain was a famous artist in this period.
16	**Abstract**	Art that is not representational or realistic. Where the formal elements of art are the subject rather than a representation of a person, object or scene. Helen Frankenthaler's artwork is an example of Abstract Expressionism.

Year 9 Computing Autumn Term Knowledge Organiser Business & Real World

Key Vocabulary:		
1	**Marketing**	Marketing is finding the needs of customers and demonstrating how a business fulfils those needs to increase sales
2	**Market Research**	The collection of data to help business decisions
3	**Primary Research**	Primary research is research you complete yourself (Questionnaire, focus group, interview)
4	**Secondary Research**	Secondary research is research that has already been completed by another person (using the internet to read a report, reading a newspaper, books.
5	**Market Segmentation**	Splitting the market into different groups.

Primary	**Pros**	**Cons**
Questionnaire	Cheaper than interviews Easily target certain people	Difficult to predict how many will be completed People may not understand the questions
Interviews	Questions can be explained Customers can easily be targeted	Expensive Customers may feel uncomfortable
Trial	Save money before making products widely available.	Costly to set up
Focus Group	Data is accurate to the target market	Only small groups that take part so expensive
Secondary Research	**Pros**	**Cons**
	Cheap and already available to use	Not exactly what you need Could be out of date Could be unreliable

Key Calculations	
Revenue	Selling Price X Number Sold
Total Cost	Fixed Costs + (Variable Cost for 1 X Number Sold
Profit or Loss	Revenue – Total Cost (It's a loss if the answer is negative)
Break Even	$\frac{\text{Fixed Costs}}{\text{Selling Price – Variable Cost per Unit}}$ (Answer in units not pounds)

Year 9 Computing Autumn Term Knowledge Organiser Graphics & Cyber Security

KEY VOCABULARY

1	**Bitmap**	Bitmap graphics are made up of pixels. Each pixel is stored on the computer as a series of 1s and 0s. When you take a photo with your smart phone it stores the digital image as a bitmap.	2	**Vector**	Vector graphics do not have any pixels. Instead they are made up of lines and shapes. When a vector is enlarged the lines and shapes are redrawn; making them great for resizing.

FILES TYPES

3	**JPG**	A system used to express numbers
4	**PNG**	Bitmap format that does not compress digital images (bigger file size than JPG). Supports transparent background.
5	**GIF**	Bitmap format that compresses digital images. Supports transparent background, animation and web safe colours
6	**TIFF**	Bitmap format that does not compress digital images (file sizes tend to be bigger). Great for printing good quality images.
7	**SVG**	Vector format; not widely supported. SWF files can be viewed using a web browser, such as Internet Explorer.

KEY VOCABULARY

8	**ADWARE**	adverts for products a user may be interested in, based on internet history
9	**AUTHENTICATION**	verifying the identity of a user or process
10	**AUTO UPDATE**	updating software to remove vulnerabilities automatically
11	**BIOMETRICS**	'password' created from the user fingerprint, iris, retina, facial, voice
12	**BLAGGING**	inventing a scenario to obtaining personal information
13	**MALWARE**	a variety of forms of hostile or intrusive software
14	**PENETRATION TESTING**	testing a network/program for vulnerabilities
15	**PHARMING**	redirecting web traffic to fake websites designed to gain personal information
16	**PHISHING**	messages designed to steal personal details/money/identity
17	**RANSOMWARE**	virus which locks a computer and encrypts files until a "ransom" is paid

Data Protection Act 2018:
All organisations and people using and storing personal data must abide by the DPA principles . It states how data should be stored/accessed and what rights a data subject has for the protection of their data.

KEY VOCABULARY

18	**CAPTCHA**	Completely Automated Public Turing Test To Tell Computers and Humans Apart
19	**DOS/DDOS**	Denial of Service attack/Distributed Denial of Service
20	**ENCRYPTION**	mathematically converts data into a form that is unreadable without a key
21	**FIREWALL**	checks incoming and outgoing network traffic for threats
22	**HACKING**	gaining **unauthorised** access to or control of a computer system'
23	**SCRIPT KIDDIES**	hackers with no technical hacking knowledge using downloaded software
24	**SHOULDERING**	directly observing someone enter personal details e.g. PIN number, password.

Year 9 Drama Spring Term Knowledge Organiser

Key Vocabulary:

1	Stage Levels	To show power, status or just different locations for the scenes.
2	Staging	Where actors and set are in the space.
3	Genre	How the performance makes you feel: Comedy? Thriller? Science Fiction?
4	Monologue	A character speaks directly to the audience about their feelings
5	Theme	The topic of the performance e.g. Supernatural.
6	Stylised	How performance is presented non naturalistically.
7	Analysing	Realising how a performance is made up of theatrical skills.

Blood Brothers Rehearsals

8 Key Themes in Blood Brothers

Social Class – This is explored through Mickey and Eddie and how Eddie has a lot more allowances and opportunities in the play because of who he is and who his parents are

Education – Edward goes to a boarding school, Mickey goes to a comp school. Mickey's class is overcrowded and the teacher has no interest. Eddie's education allows him to go to university and then get a good job.

Money – Mickey and Mrs Johnstone live without money their whole lives and struggle to make ends meet. Eddie and his family are never without money and the benefits it brings. As a result Eddie doesn't understand Mickey's frustrations and anxieties.

Nature V's Nurture - In the play the two main characters are twins and it looks at how even though they both started in the same place, how different their lives turned out because of the way they had been brought up 'nurture'

Fate/ Destiny/ Superstition – Throughout the play Mrs Johnstone makes comments about being superstitious 'shoes upon the table' and the musical questions whether these brothers were always destined to die, or whether it was because of 'class' and the society they were in.

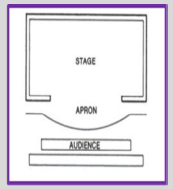
Blood Brothers Performance

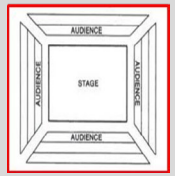
13 Line Learning

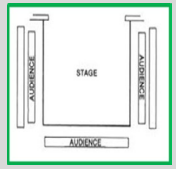
When learning a script, it is important for a performer to also learn their cues . For example, a character's first line may follow a lighting change at the start of the play and even if they are on stage prior to the lighting change they must not speak until they have seen or heard their cue

14 Staging Configurations

Proscenium Arch	The original staging for Blood Brothers. The audience sits in front of the stage. The audience views the stage as though they were peeing through a picture frame or an invisible '4 th wall'
Theatre in the Round	A style of performance where the acting space has audience all the way around it in a circle shape. Often a number of entrances. Directors have to think carefully about use of furniture and scenery as audience sightlines can easily be blocked
Thrust	Rectangular in shape. The audience directly faces the stage from all three sides







15 Conventions of a Play Text

Character list – a list of names.
Scene title – usually the setting, a theme or even just a number.
Stage Directions – descriptions of action placed in brackets during dialogue or in italics elsewhere.
Character Names – written in the left hand margin, often in capitals or before a colon
Dialogue – speech between characters
Scene – a moment of continuous action
Act – a grouping of scenes within a play

Year 9 Spanish Spring Term 3 Knowledge Organiser Logic

Llevo una dieta sana.
I have a healthy diet.

Me gusta (bastante)
I (quite) like bread

No me gusta(n) nada…
I really don't like…

el arroz/el pan
rice/bread

el pollo/el pescado
chicken/fish

la carne/la ensalada
meat/salad

la pasta/la pizza
pasta/pizza

los caramelos/los huevos
sweets/eggs

las galletas/las verduras
biscuits/vegetables

Lo / La / Los / Las como…
I eat them…

tres veces al día
three times a day

cada día/todos los días
every day

dos veces a la semana
two times a week

los fines de semana
at weekends

una vez al mes
once a month

muy a menudo
very often

a veces
sometimes

de vez en cuandio
from time to time

(Casi)nunca lo / la / los / las como
I (nearly) never eat them.

Me gusta mucho hacer deportes
I really like doing sports

Hago…
I do…

atletismo
athletics

footing
jogging

gimnasia
gymnastics

natación
swimming

Juego…
I play…

al baloncesto
basketball

al ping-pong
table tennis

al voleibol
volleyball

a la pelota vasca
pelota (a Basque ball game)

en el parque/gimnasio
in the park/gym

Voy al polideportivo
I go to the sports centre

Soy miembro de un club
I'm a member of a club

Voy a clases de baile
I go to dance classes

Prefiero jugar al fútbol
I prefer to play football

Es mi deporte favorito
It's my favourite sport

Empecé (a jugar)
I started (to play)

a los diez años
at 10 years old

Voy a empexar a (hacer)
I'm going to start (doing)

Para estar en forma…
To stay in shape..

Se debe…
You/One must…

beber agua frecuentemente
drink water frequently

comer más fruta y verduras
eat more fruit and vegetables

comer menos chocolate/caramleos
eat less chocolate/sweets

dormir ocho horas al día
sleep 8 hours a day

entrenar una hora al día
train for an hour a day

No se debe…
You/One mustn't…

beber alcohol
drink alcohol

beber muchos refrescos
drink lots of soft drinks

comer comida basura
eat junk food

fumar
smoke

Soy adicto/a al / a la / a los / a las
I'm addicted to…

A partir de ahora, voy a…
From now on I'm going to…

¿Qué te duele?
What hurts?

¿Te duele al estómago?
Does your stomach hurt?

Me duele el brazo / el estómago / el pie
My arm / stomach / foot hurts

Me duele la cabeza / la espalda / la garganta
My head / back / throat hurts

Tengo catarro
I have a cold

Tengo náuseas
I feel sick

Tengo quemaduras del sol
I have sunburn

Tengo tos
I have a cough

Me despierto (muy temprano / a las seis)
I get up (very early / at 6am)

Me levanto (enseguida)
I get up (straight away)

Me lavo los dientes
I brush my teeth

Me ducho
I shower

Me visto
I get dressed

Desayuno
I have breakfast

Ceno (…)
I have (…) for dinner

Salgo a correr
I go for a run

Corro veinte kilómetros
I run 20km

Entreno
I train

YEAR 9 HALF TERM 3 – EXPLORING RESOURCES

Vocab	Definition
Resource	Resources such as food, energy and was are what is needed for basic human development.
Renewable	A source of energy that does not run out and can be used again.
Non-Renewable	A source of energy that is going to run out and can not be used again.
Infrastructure	The physical structures that are in place to support a country, e.g. the road network and the power supply.
Water Scarcity	When there is not enough water to meet demand in a given area.
Drought	A prolonged shortage of water such as when it has not rained for a ling time.
Food security	the state of having reliable access to a sufficient quantity of affordable, **nutritious** food.
Genetically Modified Food	Foods derived from organisms whose genetic material (DNA) has been modified in a way that does not occur naturally.
Yield	A measurement of the amount of agricultural production harvested per unit of land area.
Pesticide	A substance used for destroying insects or other organisms harmful to cultivated plants or to animals.
Reservoirs	A large man made lake that used as a source of water supply.
Fossil Fuels	Sources of energy are made from decomposing plants and animals.
Food Bank	A place where food is supplied to people free of charge,

1. Demand outstripping supply

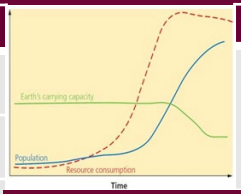
The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources varies dramatically in different locations.

Population Growth

- Currently the global population is 7.3 billion.
- Global population has risen exponentially this century.
- Global population is expected to reach 9 billion by 2050.
- With more people, the demand for food, water, energy, jobs and space will increase.

Economic Development

- As LIDCs and EDCs develop further, they require more energy for industry.
- LIDCs and EDCs want similar lifestyles to ACs, therefore they will need to consume more resources.
- Development means more water is required for food production as diets improve.



2. Dangers of demand outstripping supply.

Consumption – The act of using up resources or purchasing goods and produce.
Carry Capacity – A maximum number of species that can be supported.
Resource consumption exceeds Earth's ability to provide!

3. Energy Supply – Renewable and Non-renewable

	Advantages	Disadvantages
Solar	Renewable, no pollution, very reliable at certain points in the year and warmer countries.	Lots of energy to build, only works during the day, cannot increase power if needed.
Wind	Renewable, no pollution, no lasting damage to the environments, minimal running costs.	Not as reliable, do not work when there is no wind, can not increase supply when needed.
Hydroelectric	Renewable, no pollution, can increase power supply if needed.	A big impact on the environment from building, animals and plants may lose habitat.
Fossil Fuels	Reliable, enough to meet the current demand for energy, can produce more energy when the demand is higher, infrastructure is already in place.	Running out, releases carbon dioxide, leading to global warming, and also releases sulphur dioxide which causes acid rain.

4. Reasons for water scarcity.

There are three main factors that cause water scarcity: overuse, pollution and climate change.
- Water pollution caused 1.8 million deaths in 2015 and makes 1 billion people ill every year.
- 2 million tonnes of sewage, industrial and agricultural waste goes into the world's water every day.
- More than 2 billion people live in areas of water stress, this will increase due to increases in population and climate change.
- 160 million children live in areas at risk of drought.

5. Solutions for water scarcity.

	Methods	Impacts
Reservoirs	Increasing storage to hold more water and constructing more dams to control river flow can provide a reliable source of water.	• Can flood a large area of land and damage habitats and natural landscapes. • Dams can be a barrier for certain species to migrate upstream. • Natural flow of sediment is disrupted, which then reduces fertility of land further down.
Water Transfer	Constructing pipes and canals to divert water surplus to areas in need of a water supply.	• Large-scale engineering works can damage ecosystems along the route. • Lots of energy is required to pump water over long distances.

6. Food Availability in the UK

The UK population is around 65 million and enjoys a high level of food security.
- The UK produces 68% of its own food but this is steadily decreasing.
- The UK has to import the rest, especially seasonal food such as fruit and vegetables.
- Food production in the UK has increased by intensifying agriculture.

7. Global food inequality.

- This shows how many people are suffering from hunger or illness caused by lack of food.
- The index gives a value for each country from 0 (no hunger) to 100 (extreme hunger).

8. Solutions to food security in the UK.

Food Banks
- This is food that is donated by the public.
- They help people with a sudden loss of income.
- It is estimated that 1 million people rely on food banks for their own food security.

Urban Gardens
- These are large projects where groups work together to grow food and promote healthy living.
- This can involve planting crops in urban environments such as roundabouts.

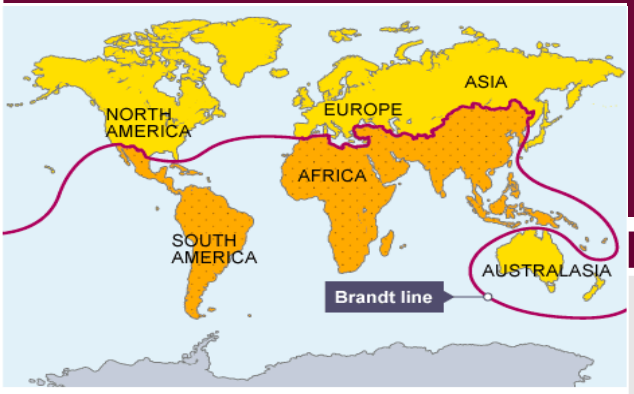
9. Global food security solutions.

Genetically Modified	Involves changing the DNA of foods to enhance their productivity and properties. Crops can be better protected from disease and drought, but also made larger or include more health benefits.
Allotments	This is an area of land that is divided into plots and rented to individuals to grow their own fruit and vegetables. Allows people in urban areas to produce their own cheap & healthily food close to home.
Intensive Farming	Makes the most of the land and allows for higher yields. This can make growing food more productive and therefore cheaper to produce. Chemical fertilisers, pesticides and herbicides can pollute the environment and harm people, animals and insects.

YEAR 9 HALF TERM4 – EXPLORING INEQUALITY

Vocab	Definition
Globalisation	
TNC	
Interconnected	
Westernisation	
Development Indicator	
Industrialisation	
Deindustrialisation	

1. The development gap



2. Development Indicators.

	Definition	High or Low in AC
GDP	Total value of goods and service produced per year.	↑
Life Expectancy	Average age a person lives to.	↑
Infant Mortality Rate	Number of babies who die under one year old, per 1000 live births.	↓
Calorie Intake	Average calories eaten per day.	↑
Energy Consumption	Average amount of energy used per person (indication of level of industry)	↑
Urban Population	Percentage of people living in towns or cities.	↑
Literacy Rate	Percentage of adults who can read or write.	↑
People per Doctor	The number of people per doctor, an indication of access to healthcare.	↓

3. Issues with development indicators.

1) Different indicators develop at different rates and all figures are averages – no measurement should be used on it own.
2) Information can be outdated or inaccurate – some countries can't or won't measure it.

4. Industrialisation and deindustrialisation in the UK.

From 1750 Britain went through a process of change in a number of key areas: **Agriculture – Industry – Transport and Communications – Technology.** There were also many scientific discoveries and technological inventions that changed society and industry

The UK has experienced **deindustrialisation**. There has been a decrease in the amount of manufacturing taking place in the country and a growth in the **tertiary** and **quaternary** sectors. Traditional industries, such as ship building and textiles, have declined.

5. Divers of globalisation.

1. Improvements in transport – containerization and jest aircraft.
2. Free – trade agreements – easy to buy and sell internationally.
3. Communication improvement – Internet and phone, access to news, TV shows and social media.

6. Impacts of globalisation.

Access to new technologies that can improve levels of development in a country.
Helps provide new services for people in EDCs and LIDCs.
Governments have been able to improve economic growth and advance infrastructure.
Improved access to resources as countries trade with one another.
Higher paying job opportunities.
Countries rely n each other and are more likely to work together.
Ideas and skills are shared between countries which can lead to greater progress.

Deindustrialisation in AC's have led to job losses.
Some resources have been over exploited which means that they may run out and they can be taken from local people.
Local people in less developed countries are likely to be exploited with poor working conditions, low pay and unfair expectations.
It can create cultures that are all the same and countries can lose their individuality.
Large amounts of pollution created by air travel and the movement of goods on ships and lorries.
Diseases such as Covid-19 can spread from one country to another far easier with so many people and goods moving around the world.

7. Fast Fashion

- The world uses an estimated 80 billion pieces of clothing every year, a 400 percent increase from two decades ago.
- Textile production contributes more to climate change than international aviation and shipping combined.
- Buying just one white cotton shirt produces the same amount of emissions as driving 35 miles in a car.
- By 2030, global apparel consumption is projected to rise by 63%, from 62 million tons today to 102 million tons—equivalent to more than 500 billion additional T-shirts
- 75% of consumers believe that sustainability is important and one-third are willing to choose brands that help environmental and social improvement.
- The fashion industry is responsible for 10% of annual global carbon emissions.
- Around 300,000 tonnes of textile waste ends up in household black bins every year, sent to landfill or incinerators. Less than 1% of material used to produce clothing is recycled into new clothing at the end of its life
- Clothing companies create more than 1 million garments every day.
- Fast fashion emissions will grow by 50% by 2030, if current growth continues. Extending the life of clothes by just 9 months of active use would reduce carbon, water and waste footprints by 20-30% each.

Topic 3
Distinctive Landscapes

What is a landscape?

A landscape has visible features that make up the surface of the land. Landscapes can be broken down into four 'elements'.

Landscape Elements

Physical
- Mountains
- Coastlines
- Rivers

Biological
- Vegetation
- Habitats
- Wildlife

Human
- Buildings
- Infrastructure
- Structures

Variable
- Weather
- Smells
- Sounds/Sights

Relief of the UK

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

Key

Lowlands

Uplands

Areas +600m: Peaks and ridges cold, misty and snow common. i.e. Scotland

Areas -200m: Flat or rolling hills. Warmer weather. i.e. Fens

Erosion

The break down and transport of rocks – smooth, round and sorted.

Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolved rocks.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.

Transportation

A natural process by which eroded material is carried/transported.

Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.

Glaciation in the UK

Over many thousands of years, glaciation has made an impression on the UK's landscape. Today, much of upland Britain is covered in u-shaped valleys and eroded steep mountain peaks.

During the ice age

Ice covered areas eroded and weathered landscapes to create dramatic mountain scenery.

After the ice age

Deep valleys and deposition of sediment revealed

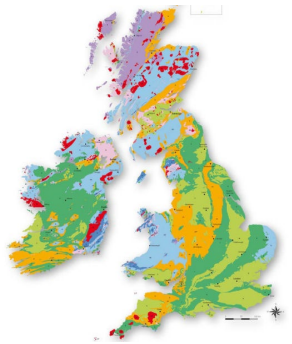
Geology of the UK

The UK is made from a variation of different rock types. The varied resistance of these rocks influences the landscape above.

Igneous Rock
Volcanic/molten rock brought up to the Earth's surface and cooled into solid rock.

Sedimentary Rock
Made from broken fragments of rock worn down by weathering on Earth's surface.

Metamorphic Rock
Rock that is folded and distorted by heat and pressure.



Soil & Landscape

- Soils are created from weathered rocks, organic material and water. Rock types have influence over fertility of soil.
- Low-laying areas such as the Cambridgeshire Fens have deep soil whereas uplands have thin soil.
- Deep soil is more often associated with deciduous woodland rather than coniferous woodlands.

Human activity on Landscape

Farming has changed the vegetation which grows there.	**Much of the rural landscape has been replaced by urban sprawls.**	**Infrastructure such as roads and pylons cover most of the UK.**
Over thousands of years, much of the UK's woodlands have gone.	**Increasing population of the UK means more houses are needed.**	**UK's marshes and moorlands are heavily managed by people.**

Climate and Weather in the UK

The variations of climate and weather means there are different influences on the UK's landscape.

Climate

The rainfall map of the UK shows variations in average rain.
- **Less** precipitation occurs in low land areas. East England
- **Most** precipitation occurs in upland areas. Scotland.

These differences mean...
Uplands experience more weathering, erosion and mass movement.

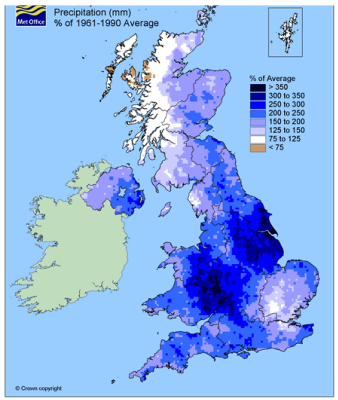
Weathering

Mechanical
Caused by the physical action of rain, frost and wind.

Chemical
Action of chemicals within rain dissolving the rock.

Biological
Rocks that have been broken down by living organisms.

Average rainfall in the UK

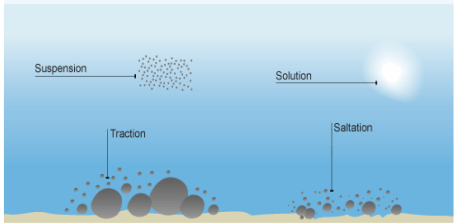


Freeze-thaw weathering

Stage One
Water seeps into cracks and fractures in the rock.

Stage Two
When the water freezes, it expands about 9%. This wedges apart the rock.

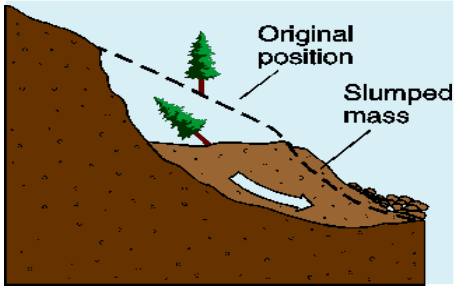
Stage Three
With repeated freeze-thaw cycles, the rock breaks off.



Mass Movement

A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.

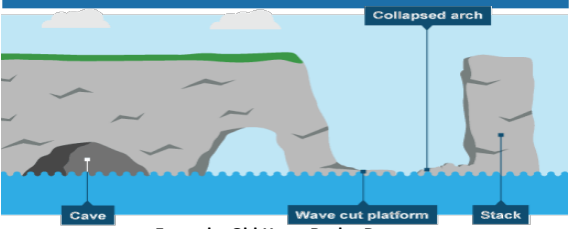
1	Rain saturates the permeable rock above the impermeable rock making it heavy.
2	Waves or a river will erode the base of the slope making it unstable.
3	Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
4	The debris at the base of the cliff is then removed and transported by waves or river.



Deposition

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

Formation of Coastal Stack



Example: Old Harry Rocks, Dorset

1) Hydraulic action widens cracks in the cliff face over time.
2) Abrasion forms a wave cut notch between HT and LT.
3) Further abrasion widens the wave cut notch to from a cave.
4) Caves from both sides of the headland break through to form an arch.
5) Weather above/erosion below –arch collapses leaving stack.
6) Further weathering and erosion eaves a stump.

Coastal Defences

Hard Engineering Defences

Groynes	Wood barriers prevent longshore drift, so the beach can build up.	✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave . Has a lip to stop waves going over.	✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Gabions or Rip Rap	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

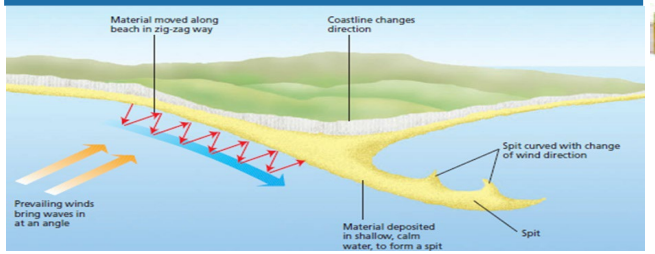
Soft Engineering Defences

Beach Nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing. ✗ Offshore dredging damages seabed.
Managed Retreat	Low value areas of the coast are left to flood and erode naturally.	✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.

Formation of Bays and Headlands

1) Waves attack the coastline.
2) Softer rock is eroded by the sea quicker forming a bay, calm area cases deposition.
3) More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

Formation of Coastal Spits - Deposition



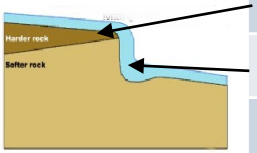
Example: Spurn Head, Holderness Coast

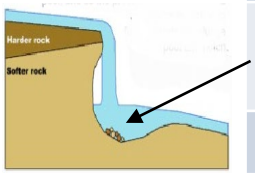
1) Swash moves up the beach at the angle of the prevailing wind.
2) Backwash moves down the beach at 90° to coastline, due to gravity.
3) Zigzag movement (Longshore Drift) transports material along beach.
4) Deposition causes beach to extend, until reaching a river estuary.
5) Change in prevailing wind direction forms a hook.
6) Sheltered area behind spit encourages deposition, salt marsh forms.

Upper Course of a River

Near the source, the river is flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall



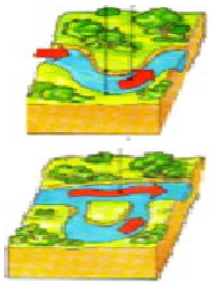


1) River flows over alternative types of rocks.
2) River erodes soft rock faster creating a step.
3) Further hydraulic action and abrasion form a plunge pool beneath.
4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
5) Waterfall retreats leaving steep sided gorge.

Middle Course of a River

Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

Formation of Ox-bow Lakes



Step 1

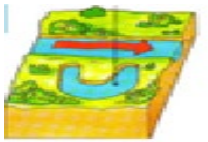
Erosion of outer bank forms river cliff. Deposition inner bank forms slip off slope.

Step 2

Further hydraulic action and abrasion of outer banks, neck gets smaller.

Step 3

Erosion breaks through neck, so river takes the fastest route, redirecting flow



Step 4

Evaporation and deposition cuts off main channel leaving an oxbow lake.

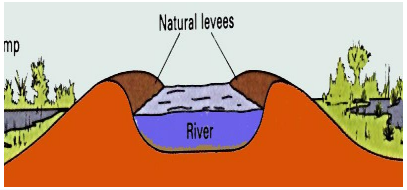
Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

Formation of Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.

✓ Nutrient rich soil makes it ideal for farming.
✓ Flat land for building houses.



River Management Schemes

Soft Engineering

Afforestation – plant trees to soak up rainwater, reduces flood risk.
Demountable Flood Barriers put in place when warning raised.
Managed Flooding – naturally let areas flood, protect settlements.

Hard Engineering

Straightening Channel – increases velocity to remove flood water.
Artificial Levees – heightens river so flood water is contained.
Deepening or widening river to increase capacity for a flood.

Case Study: The Holderness Coast

Location and Background
Located along the North-East coast in the county of Yorkshire. The coast extends 50km from Flamborough Head to Spurn Head.

Geomorphic Processes
-Flamborough Head is made from more resistant chalk. Features: wave-cut platforms, caves and stacks
-South from Flamborough Head the less resistant boulder clay is dominate. This coasts erodes 1.8m per year and is the fastest in Europe. Cliff slumping can be evident.
-Further south, Spurn Head is a coastal spit created by continual deposition from LSD that extents out to sea.

Management
-Rapid erosion means there are a number of different management schemes from soft to hard engineering.
-High population centres such as Withersea and Horsea are protected by 'hold the line' defence measures such as sea walls, groynes & heavy beach nourishment.
-Underpopulated & economic centres, such as farmland, are under 'managed retreat' schemes.

Case Study: The River Tees

Location and Background
Located in the North of England flows 137km from the Pennines to the North Sea at Red Car.

Geomorphic Processes
Upper – Features include V-Shaped valley, rapids and waterfalls. Highforce Waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.
Middle – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.
Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.

Management
-Towns such as Yarm and Middleborough are economically and socially important due to houses and jobs that are located there.
-Dams and reservoirs in the upper course, controls river's flow during high & low rainfall.
- Better flood warning systems, more flood zoning and river dredging reduce impact from flooding.

Year 9 History Spring Term Knowledge Organiser

Key Vocabulary:

1	Appeasement	Giving in to someone's demands as far as is reasonably possible to avoid conflict.
2	Evacuation	the policy or removing children and pregnant women from cities in case of bombing by the enemy
3	Allies	The alliance of the UK, the USA and France in World War Two.
4	Axis	The alliance of Germany, Italy and Japan in World War Two.
5	Diktat	This is what the Germans called the Treaty of Versailles as they saw it as a very harsh settlement forced on them by the allies.
6	Armistice	The agreement to end World War One
7	Anschluss	The union of Germany and Austria when Hitler marched his soldiers into Austria in 1938.

Treaty of Versailles and how Hitler destroyed it

8 What is it?

This is a treaty that Germany was forced to sign after the armistice at the end of World War One. Germans felt that they were treated unfairly and it was a 'diktat' something they were forced to do but didn't agree to and didn't think was fair.

9 What parts of the Treaty did the Germans dislike?

Guilt – Clause 231: Germany accepted blame for the war
Army – army/ 100,00 men only/ no submarines / no aeroplanes / 6 battleships / Rhineland demilitarized
Reparations - £6.6 million for damage
Germany Lost Land – Saar, Sudetenland, Danzig, Loss of Colonies
League of Nations set up
Extra Point – Forbade Anschluss

10 How Hitler destroyed the Treaty of Versailles:

Year	Event
1936	Hitler starts to rearm Germany, reintroduces conscription, enters demilitarised Rhineland
April 1938	Anschluss with Austria as 99% of Austria vote in favour of a union between Germany and Austria
Sept 1938	The Sudentenland is given to Germany at the Munich Conference
Mar 1939	Hitler marches into Czechoslovakia and seizes control of the rest of the nation.
Aug 1939	Germany and the USSR agree to the Nazi-Soviet Pact
Sep 1939	Hitler invades Poland and seizes control

11. Why Britain followed a policy of appeasement:

(1) Some British people approved of Hitler's policies
(2) The British people hoped that a strong Germany would stop the growth of Russian Communism
(3) Many people felt that events in Europe were not Britain's business
(4) Many people felt Britain was too weak and far away to help anyway.
(5) Many British people wanted peace
(6) Many British people agreed with Hitler that the Treaty of Versailles was unfair

Events in World War Two

12 Dunkirk

The evacuation of Allied soldiers during World War II from Dunkirk, between 26 May and 4 June 1940. This was due to large numbers of Belgian, British, and French troops being cut off and surrounded by Germans during the Battle of France.

14 Leningrad

Nazi Germany invaded Russia in June 1941 and advanced until they reached the city of Leningrad. The Germans laid siege to the city for 3 years which killed 650,000 Russians in 1942 alone, mostly from starvation, exposure, disease, and shelling. A million children, sick and elderly were evacuated.

15 Pearl Harbor

Pearl Harbor is a U.S. naval base in Hawaii, that was the scene of a devastating surprise attack by Japanese forces on December 7, 1941. This attack brought America into the war

16 Burma:

Japan invaded Burma in 1942, then part of the British Empire. This war was fought in some of the most challenging terrain in the world, in a tropical climate that claimed many men before they had a chance to fight. It wasn't until Japan surrendered in 1945 after the dropping of the Atomic Bomb that the war in Burma was over

17 Battle of Midway

One of the most important naval battles win which the Japanese hoped to lure the Americans into a trap in the Pacific Ocean but American codebreakers found out the plan so the Americans were able to defend themselves and ended up destroying most of the Japanese navy. 3-6th June 1942

17 El Alamein

(1–27 July 1942, 23 October—11 November 1942), The Allies wanted to control the North Africa desert so they could carry supplies through the Suez Canal. The British used 300 Sherman tanks against the Germans and the Germans surrender in May 1943.

18. How did Commonwealth countries help Britain?

1. I million men and women (90% of the British Army in this area of the world) fought for Britain in the Far East in places like Burma. These soldiers came from India, Pakistan, and Bangladesh and 3% came from places in Africa.
2. 500,000 Australian and New Zealand soldiers fought in the Pacific with the Americans

Year 9 Science Autumn Term Knowledge Organiser – Human Interaction

Key Vocabulary:

1	Biodiversity	The variety of different species in an ecosystem
2	Sampling	Techniques used to measure populations of living organisms.
3	Quadrat	1 meter wooden square used to estimate populations of living organisms.
4	Abundance	A measure of a population.
5	Stable ecosystem	Where species in an ecosystem do not depend on each other.
6	Peat	Peat from peat bogs is used for compost for gardens and farms, destroying habitats
7	Greenhouse gases	Carbon dioxide, methane and water vapour. Released from combustion of fossil fuels and farming.
8	Global warming	
9	Pollution	Substance released from human waste that damage ecosystems. E.g. Water, air and land pollution.
10	Biomass	Total quantity or weight of biological matter.
11	Trophic level	Level or position in a food chain.
12	Fusarium fungus	Fusarium fungus is used to produce mycoprotein (Quorn), a protein-rich food suitable for vegetarians.
13	GM (Genetic modification)	GM crops, such as golden rice, can be used to provide increased nutritional value in areas where it is lacking
14	Sustainable	Able to be maintained at a certain rate or level.

Human Interactions

15 Sampling

a) Techniques used to measure populations of living organisms.

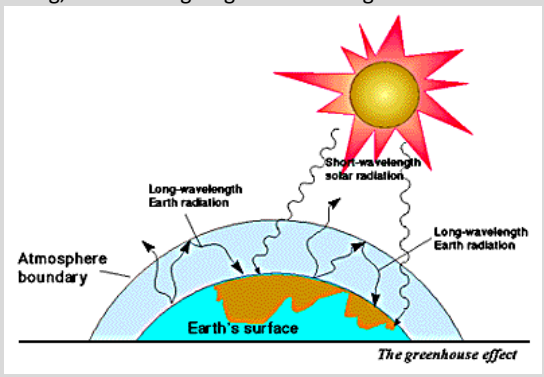
b) Random sampling - Used to measure the abundance of a living organism in a habitat using random coordinates.

c) Systematic sampling - Used to measure the effect of a factor on the distribution of a species, using a transect.

d) Quadrat

16 Greenhouse Effect

Levels of carbon dioxide and methane in the atmosphere are increasing, contributing to global warming



17 Consequences of Global Warming

There are many biological consequences to global warming including:

a) Melting polar ice caps
b) Rising sea levels
c) Extreme weather patterns
d) Flooding
e) Loss of habitats

18 Reducing Human Impact

How humans can reduce their impact on Biodiversity by:

a) Protecting rare habitats
b) Maintaining nature reserves
c) Breeding programmes for endangered species
d) Recycling resources to reduce landfill waste
e) Reducing deforestation
f) Growing hedgerows on farms to allow more crops to grow

Increasing Human Population

19 Increasing Human Population

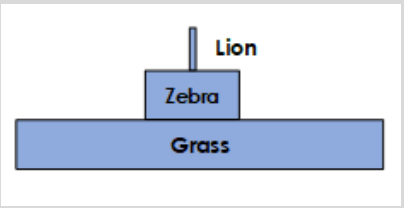
The increasing human population means that more resources are required and more waste is produced. More waste is also produced through the improved standard of living.

If waste is not treated properly it results in pollution:

a) **Water pollution** is caused by poor sewage treatment and leaching of fertilisers
b) **Air pollution** is caused by smoke and acidic gases
c) **Land pollution** is caused by landfill and toxic chemical waste

20 Pyramids of Biomass

- Biomass is lost between trophic levels in a food chain
- Biomass is lost through waste (faeces, urine, sweat, gas) and through life processes such as movement and thermoregulation



21 Farming

a) Efficiency of food production can be improved by restricting energy transfer from food animals to the environment.
b) This includes intensive farming methods where movement of animals is limited and the temperature of their surroundings is controlled.
c) Fish stocks in oceans are declining because of overfishing

22 Food Security

Food security is having enough food to feed a population. Many factors can threaten food security:

a) Increasing birth rate.
b) Changing diets in developed countries means that scarce food resources are being transported across the world
c) New pests and pathogens are affecting farming
d) Environmental changes, including droughts, which can lead to famines
e) Political instability and conflicts in some parts of the world threaten access to food and water

Year 9 Science Spring Term – Introduction to Quantitative Chemistry

Key Vocabulary:

1	**Atom**	The smallest part of an element that can exist independently.
2	**Atomic Number**	The number of protons in an atom of an element. This is he smallest number of the two numbers provided for each element on the periodic table.
3	**Chemical Formula**	A series of chemical symbols showing the number of atoms of each element in a compound.
4	**Compound**	A substance made up of two or more different elements chemically bonded together.
5	**Concentration**	The mass of solute dissolved in a given volume of solvent.
6	**Conservation of Mass**	The law of conservation of mass states that the total mass of reactants in any chemical reaction equals the total mass of product.
7	**Element**	A substance made of only one type of atom.
8	**Mass Number**	The total number of protons and neutrons in the nucleus of an atom. It is the larger of the two numbers beside each element in the periodic table.
9	**Mixture**	A material consisting of two or more different substances that are not chemically combined.
10	**Molecule**	A small group of non-metal atoms chemically bonded together.
11	**Relative Atomic Mass**	The relative atomic mass of an element is the relative mass of its atoms compared to the mass of a carbon-12 atom. The relative atomic masses for each element are given in the Periodic Table.
12	**Relative Formula Mass**	The relative formula mass of a substance is the sum of the relative atomic masses of its atoms, in the numbers shown in it's chemical formula.

13 Chemical Reactions

Chemical reactions always involve the formation of one or more new substances.

- Chemical reactions often involve a temperature change.
- Formulae are used to show the elements bonded together in a compound e.g. H_2O contains 2 hydrogen atoms and one oxygen atom.
- Compounds can only be separated into their elements by a chemical reaction e.g. $2H_2O \rightarrow 2H_2 + O_2$
- In chemical equations the three states of matter are shown as: solid = (s); liquid = (l) and gas = (g) aqueous solutions are shown as (aq)
    - e.g. $2Na(s) + 2H_2O(l) \rightarrow 2NaOH(aq) + H_2(g)$
- An aqueous solution is a substance dissolved in water.

14 Relative Formula Mass

- The relative atomic mass (A_r) is the average mass of the atoms of an element compared to the mass of carbon-12.
- The relative formula mass (Mr) of s substance is the sum of the A_r of all the atoms in the formula.
- e.g. What is the M_r of water (H_2O)?
    - (A_r H = 1.0; O = 16.0)
- There are 2 x H and 1 x O in the formula
    - (2 x 1.0) + (1 x 16.0) = 18.0
- A_r and M_r have no units as they are relative masses.
- In a balanced chemical equation:
- sum M_r reactants = sum M_r products
    - e.g. $2H_2O_2 \rightarrow 2H_2O + O_2$
- Mr reactants = 2 x 34 = 68
- Mr products = (2 x 18) + 32 = 68
- The percentage mass of an element in a compound can be calculated using the relative atomic mass and the relative formula mass.

15 Conservation of Mass & Balancing Equations

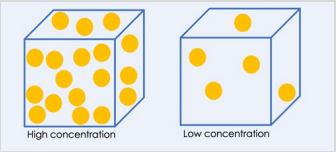
- No atoms are lost or made during a chemical reaction.
- mass of products = mass of reactants
- Chemical reactions can be represented by symbol equations which are balanced.
- This means the number of atoms of each element is balanced e.g. $2Mg + O_2 \rightarrow 2MgO$
- there are 2 magnesium atoms on each side of the equation.
- During the reaction hydrogen gas is produced. If the gas is free to leave the reaction container then the measured mass will decrease.
- Some reactions may appear to involve a change in mass, but this is normally because a reactant or a product is a gas e.g. $Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$

16 Uncertainty

- Scientific uncertainty means there is a range of possible values within which the true value of a measurement lies.
- Whenever a measurement is made, there is always some uncertainty about the result obtained.

17 Concentration

- Many chemical reactions take place in solutions.



- The more concentrated a solution the more particles it contains in a given volume.
- The concentration of a solution can be measured in mass per given volume of solution e.g. grams per dm^3 (g/dm^3).
    - $\frac{\text{mass of solute}}{\text{volume of solution}}$ = concentration
- Volumes need to be in dm^3
- 1 dm^3 = 1000 cm^3

18 Making Soluble Salts

- Soluble substances dissolve in a solvent.
- Insoluble substances cannot dissolve in a solvent.
- Neutralisation reaction general equation is acid + base → salt + water
- Metal + acid → salt + hydrogen
- Metal oxide + acid → salt + water
- Metal hydroxide + acid → salt + water
- Metal carbonate + acid → salt + water + carbon dioxide
- Soluble salts can be made from acids by reacting them with solid insoluble substances, such as metals, metal oxides, hydroxides, or carbonates.
- The solid is added to the acid until no more reacts and the excess solid I filtered off to produce a solution of the salt.
- Salt solutions can be crystallised to produce solid salts.
- Copper oxide reacts with sulfuric acid solution to produce copper sulfate and water.
- This reaction can be represented with the equation CuO(s) + H2SO4(aq) → CuSO4(aq) + H2O(l)
- Copper sulfate solution is a blue liquid.
- Copper sulfate crystals are blue.

Year 9 Spanish Spring Term 4 Knowledge Organiser Logic

Tengo derecho… I have the right…	*al amor y a la familiar* to love and to family *al juego* to play *a la educación* to education *a la libertad de expresión* to freedom of expression *a un media ambiente sano* to a healthy enviroinment *a vivr en armonía* to live in harmony	*No puedo…* I can't…	*dar mi opinión* give my opinion *jugar con mis hermanos* play with my brothers and sisters *salir solo/a* go out alone *dormir* sleep *ir al insti(tuto)* go to school *respirar* breathe	*porque…* because…
Para proteger el medio ambiente… In order to protect the environment… *Se debería* You/We should…	*ahorrar energía en casa* save energy at home *apagar la luz* turn off the light *cerrar el grifo* turn off the tap *conservar el agua* save water	*ducharse en vez de bañarse* shower instead of bathing *ir en bici(cleta)* go on bike *reciclar el papel / el plástico ./ el vidrio* recycle paper / plastic / glass *usar transporte público* use public transport	*No se debería….* You/We shouldn't…	*malgastar el agua* waste water *tirar la basura al suelo* throw rubbish on the floor *usar bolsas de plástico* use plastic bags
¿Cómo era tu ciudad antes? What was your town/city like before? *Antes...* Before…	*era (bastante) aburrida* It used to be (quite) boring *era (muy) peligrosa* It used to be (very) dangerous *estaba sucia* It used to be dirty *había mucha basura* there used to be lots of litter	*había mucha contaminación* there used to be lots of pollution *había mucha violencia* there used to be a lot of violence *no había transporte público* there wasn't public transport *no había nada para los jóvenes* there wasn;'t anything for young people	*¿Cómo es ahora?* What's it like now? *Ahora…* Now…	*está limpia* it's clean *hay menos basura/contaminación* there's less rubbish/pollution *hay parques y espacios públicos muy bonitos* there are very nice parks and public spaces *hay muchas cosas para los jóvenes* there's lots for young people
Soy boliviano/.a I am Bolivian *Soy colombiano/a* I am Colombian *Soy mexicano/a* I am Mexican *Soy norteamericano/a* I am American	*Soy inglés/inglesa* I am English *Soy español(a)* I am Spanish *Soy paquistani* I am Pakistani	*Tiene (diez) años* He/She is (ten) years old *Vive con so familia / en una plantación* He/She lives with their family / on a plantation *Trabaja/Trabajan…* He/She works / They work… *(catorce) horas al día* (14) hours a day	*(seis) días a la semana* (6) days a week *para un patrón* for an employer *para una cooperativa* for a cooperative *Gana/Ganan (treinta) euros al mes* He/She earns / They earn (30) euros a month	

Year 9 Design and Technology Spring Term Knowledge Organiser

Key Vocabulary:

1	CAD	Computer-aided design is the use of computers to aid in the creation, modification, analysis, or optimization of a design. This software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing.
2	CAM	Computer Aided Manufacturing is the use of software and computer-controlled machinery to automate a manufacturing process.
3	Automation	Automation describes a wide range of technologies that reduce human intervention in processes.
4	Crowd Funding	A scale model is a physical model which is geometrically similar to an object (known as the prototype). Scale models are generally smaller than large prototypes such as vehicles, buildings. Models built to the same scale as the prototype are called mock-ups.
5	Virtual Marketing	Viral marketing or viral advertising is a business strategy that uses existing social networks to promote a product mainly on various social media platforms.
6	Planned Obsolescence	In economics and industrial design, planned obsolescence is a policy of planning or designing a product with an artificially limited useful life or a purposely frail design, so that it becomes obsolete after a certain pre-determined period of time .

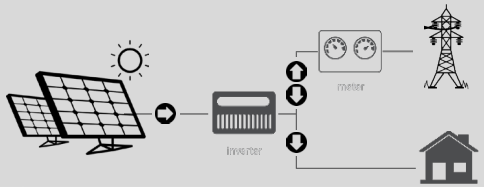
Pewter Casting

7	Natural	Existing in or derived from nature; not made or caused by humankind. For example, gold is naturally occurring but a gold bar or gold ring is man-made.
8	Environment	The natural environment or natural world encompasses all living and non-living things occurring naturally, meaning in this case not artificial. The term is most often applied to the Earth or some parts of Earth.
9	Sustainability	A societal goal with three dimensions: the environmental, economic and social dimension. Environmental sustainability occurs when natural resources are preserved.
10	Renewable Energy	Renewable energy is energy that is collected from renewable resources that are naturally replenished on a human timescale. It includes sources such as sunlight, wind, rain, tides, waves, and geothermal heat.
11	Fossil Fuels	A fossil fuel is a hydrocarbon-containing material formed naturally in the earth's crust from the remains of dead plants and animals that is extracted and burned as a fuel. The main fossil fuels are coal, crude oil and natural gas.
12	Nuclear Power	the use of nuclear reactions to produce electricity. Nuclear power can be obtained from nuclear fission, nuclear decay and nuclear fusion reactions. Presently, the vast majority of electricity from nuclear power is produced by nuclear fission of uranium and plutonium in nuclear power plants.

3D Design

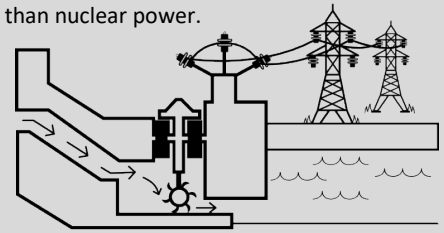
13 Solar Panel - What is it?

A solar cell panel, solar electric panel, photo-voltaic module or solar panel is an assembly of photo-voltaic cells mounted in a framework for installation. Solar panels use sunlight as a source of energy to generate direct current electricity.



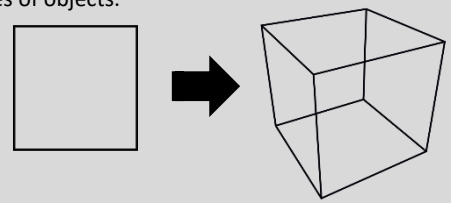
14 Hydroelectric - What is it?

Hydroelectricity, or hydroelectric power, is electricity produced from hydropower. In 2020 hydropower generated one sixth of the world's electricity, almost 4500 TWh, which was more than all other renewables combined and also more than nuclear power.



15 Perspective Projection

It is a simple type of technical drawing of graphical projection used for producing three-dimensional (3D) images of objects.



16 Evaluation

Designers evaluate their finished products to test whether they work well and if design can be corrected or improved. It is important to evaluate your work constantly during the project to see if it is on track and so that improvements can be built-in throughout the design process, not just at the end.

Year 9 Music Spring Term 2 Knowledge Organiser

Key Vocabulary:

1	Tone Row	All 12 notes (CDEFGAB and C#, D#, F# G# and A#) played in a pattern – each used only once before repeating
2	Phasing	Musical melodies or rhythms that when the parts of music repeat, one part moves "out of time" by adding a rest or extra note
3	Layering	Having multiple instruments playing the same thing at different times
4	Diminution	Making the notes shorter so the music speeds up
5	Augmentation	Making the notes longer so the music slows down
6	Polyrhythm	Layers of different rhythms played at once – normally in African/world music
7	Harmony	Using notes of other notes added underneath the melody
8	Retrograde	Composing a melody and using it backwards as well as forwards – example CDEFG = GFEDC
9	Inversion	Where you compose some music and turn it upside down

Music Theory

10 Minimalism

Minimalist music is a form of Western art music that developed during the 1960s and 1970s. Minimalist composers took the music back to its basics of pitch and rhythm. They focused on slow and gradual changes over the course of the music.

Minimalist composers constructed their music from simple rhythmic or note patterns referred to as cells. These cells are repeated continuously and are only subject to occasional changes over time.

Features include:

- layers of ostinato – repeated rhythms and melodies
- constantly repeated patterns that are subjected to gradual changes.
- layered textures.
- interlocking repeated phrases and rhythms.
- diatonic harmony.

11 Steve Reich

Steve Reich is an American composer, born in 1936.
He is best known for his music composed in the "Minimalistic" style.

He developed the style. Many of the music he wrote is **diatonic** and the patterns are layered on top of each other to create harmony.

Some music in this style is based solely on rhythm cells, such as *Clapping Music*.

Minimalist composers often experimented with music technology in order to produce repeating cells called **loops**.

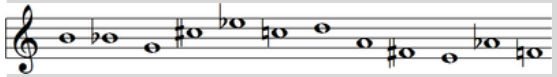
Music Theory

12 Clapping music – phase shifting

Clapping Music was composed in 1972. There are 2 parts of music. Each part begins by clapping the main rhythm in unison. The music is in bars – each bar repeats 12 times. The first part clapping the main rhythm never changes. The second part moves its rhythm after each repeated bar. This technique is called **phrase shifting**. As the phrases move out of sync with one another, a **polyrhythmic** texture is created. The process continues until both performers are synchronised once more clapping the same rhythm in **unison**

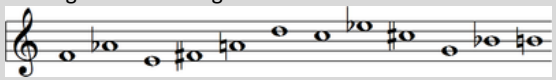
13 Tone Row - Schoenberg

Suppose the original row is:



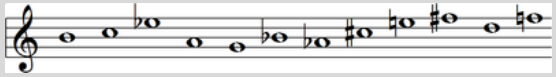
B, B♭, G, C♯, E♭, C, D, A, F♯, E, A♭, F

Retrograde is the original row in reverse order:



F, A♭, E, F♯, A, D, C, E♭, C♯, G, B♭, B

The inversion is the original but with the # and b different:



B, C, E♭, A, G, B♭, A♭, C♯, E, F♯, D, F

Tone row or serialism and minimalism use these techniques in the music

Arnold Schoenberg or Schönberg was an Austrian-American composer, music theorist, teacher, writer, and painter. He is widely considered one of the most influential composers of the 20th century. He was associated with the expressionist movement and Serialism in Germany
Born: 13 September 1874, Died 13 July 1951 - LA

Year 9 Music Spring Term 1 Knowledge Organiser

Key Vocabulary:

1	Ensemble	A group of people playing instruments – including voices
2	Pentatonic	A pattern of only 5 notes – used in the music of Asia and other world musics
3	World Music	Traditional music from countries around the world Each country has it's own musical identity and style
4	Syncopation	Music and rhythms played "off" the beat
5	Call and response	A musical way of the "leader" starting a musical conversation – the leader makes the musical call and the ensemble responds in music to it
6	Polyrhythm	Layers of different rhythms played at once – normally in African/world music
7	Fusion music	Where traditional music of a country is influenced and mixed with western musical styles
8	Bollywood	The biggest and most profitable movie style in the world – over 10,000 films have been made and watched over the past 50 years
9	Rag and Taal	Indian music scales and instructions – all music has a time and meaning

Music Knowledge

10 Music of China

Music began in China 1000's of years ago as evidenced by excavations in Henan uncovering bone flutes dating back 8,000 years, and clay music instruments in Xi'an dating back 6,000 years.

The Zhou Dynasty established a formal system of court and ceremonial music which the music links to the idea of yin and yang.

12 Music of Indonesia

Gamelan is a type of instrumental ensemble music that originates from Indonesia.

Gamelan comes from the Javanese word 'gamel', which means 'to strike' = Most of the instruments in the ensemble are percussion instruments – such as metallophones (instruments comprising bronze bars of different pitches) and gongs.

The Kendang drives the rhythm and leads the ensemble into the different structures and time in the music.

The melodic instruments play the melody in various layers to the ensemble. Each instrument plays the melody at a different speed.

Music Knowledge

14 Music of Africa

The music of Africa differs depending on the area of Africa you are. In the north the music is influenced by the Mediterranean countries – melodic but with driving rhythms. The music of the middle countries are far more rhythmic – using drums and xylophones. The music of the South are a combination of driving rhythms and melodies with syncopation.

The main features are

Music made with percussion instruments

Polyrhythms

Call and response singing

A pentatonic pitch system, and bending/sliding pitches

15 Music of Samba

The music is played with different drums - surdo drum, used for keeping a steady beat, snare drums, a whistle called an apito or solo drummer, used for beginning and ending sections of music, other types of untuned percussion, and different varieties of bells.
Other sections are when the apito or solo drummer blasts one rhythm, and all other instruments respond using another named a call and response section; and a Samba piece can have instrument solos, when one instrument is playing an exciting rhythm.

It is usually played as street music for carnivals and celebrations

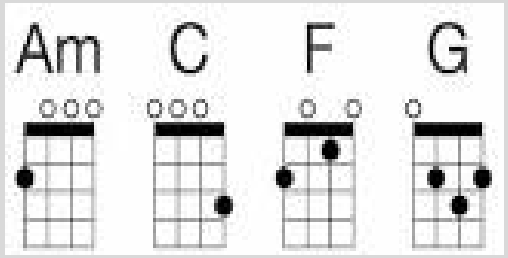
Year 9 Music Spring Term Knowledge Organiser

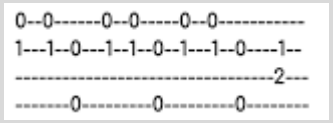
Key Vocabulary:

1	Melody	The main tune or musical theme
2	Articulation	How the notes are played – smooth (legato) or short (staccato)
3	Ukulele	Small 4 stringed member of the string family – is linked to Hawaii
4	Plectrum	The disk used to help with playing the guitar or ukulele – often called a "pick"
5	Strumming	Using your right hand in a down and up motion playing all 4 strings of the ukulele to play chords
6	Finger picking	Using one finger of the right hand to pluck the ukulele strings to play one note at a time – like for a melody line
7	Chords	2 or more notes played together at the same time, example - CEG
8	Major key	Major keys are happy sounding – for the chords we use C = CEG, F = FAC and G= GBD are all major chords
9	Minor key	Minor keys are more sullen (sad) in sound – for the chords we use Am – ACE is the minor chord

Music Context

10 4 Chords and tab





On the ukulele tab music 0= open string a number or dot shows which fret to place your finger

11 The 4 chord trick

The 4 chord trick has been used in Pop songs for many years. It is a formula created after the 1950's, where the 12 Bar Blues 3 chords were still used.

The chords are played C, G, Am, F

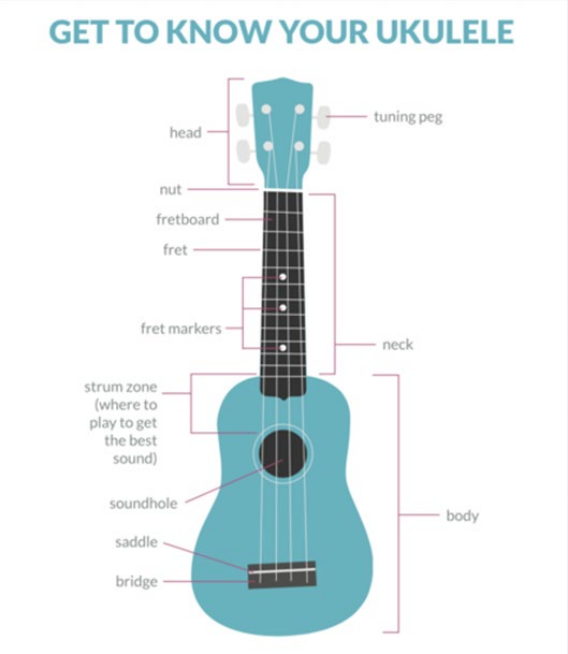
There are over 150 songs that use the exact same pattern – different speeds and genres

12 The 4 chords

In music the chords are written in Roman numerals like this I-V-vi-IV
To the player it looks like this = C – G – Am - F

This progression is called "the most popular progression" for a reason. It's been used in just about every genre imaginable, from post-punk to country and western music.

13 The ukulele



14 Ukulele facts

The word 'ukulele' is the Hawaiian word for 'jumping flea'.

Ukuleles most commonly have four strings but some are paired and have as many as eight strings. The tuning of a four string ukulele is G, C, E, A.

Year 9 Religious Studies Spring Term Knowledge Organiser – Ethical Issues

Key Vocabulary:

1	Contraception	Methods used to prevent pregnancy and the transmission of STIs.
2	Homosexuality	Being attracted to people of the same sex.
3	Abortion	The termination of a pregnancy.
4	Euthanasia	The painless killing of a patient suffering from an incurable and painful disease or in an irreversible coma.
5	Corporal Punishment	Punishment used on the body, for example whipping or flogging.
6	Capital Punishment	The death penalty.
7	Forgiveness	The action or process of forgiving or being forgiven after having done wrong.

Relationships and Families

8 Sex Before Marriage

Many religious traditions teach that people should wait until they are married to have sex. Nearly 70% of UK couples aged between 16-29 are cohabiting, rather than being married or in a civil partnership.

9 Contraception

Catholic Christianity teaches that the use of contraception, or methods to prevent pregnancy, goes against God's command for humans to 'be fruitful and increase in number'.

10 Homosexuality

There are contradictory teachings on homosexuality amongst religious groups. Islam teaches that Allah made 'wives for [men]' and that it is God's plan for men and women to get married.

In the Old Testament, it teaches Christians that God 'made mankind in [His] image', which some Christians believe means that homosexuality is part of God's creation.

11 Abortion

Abortion was legalized in the UK in 1967. It is estimated that 1 in 3 women will have an abortion in their lifetime.

Catholic Christianity teaches that life begins at conception, so abortion is the equivalent to murder.

12 Euthanasia

Islam and Christianity both teach that God gave us life, and that it is a sacred (holy/special) gift. Therefore, ending someone's life, even with good intention, is the same as murder and is not permitted.

Some Christians believe that ending someone's suffering is 'doing the most loving thing'.

Crime and Punishment

13 Corporal Punishment

The Qur'an teaches Muslims that some crimes should be punished by using bodily harm, for example 'flog them each with a hundred stripes'. However, Prophet Muhammad (pbuh) said 'do not [use corporal punishment] to urge your family to fear Allah'.

14 Capital Punishment

Many Christians disagree on the use of the death penalty. All life is sacred and belongs to God, so many Christians believe we should never take a life – even as a punishment.

However the Old Testament teaches 'a life for a life' so some believe it is an acceptable punishment.

15 Forgiveness

Jesus told his disciples to forgive 'not seven times, but seventy seven'. He believed that nobody was perfect and so we shouldn't stand in judgement of other people. Instead, we should forgive because ultimately we want God to forgive us.

16 Status of Women

Both Christianity and Islam have different views on the status of women.

Both teach that God created all lives, and so many religious people believe that women should be treated equally. However, this doesn't necessarily mean that men and women should have the same roles or jobs.

Catholics believe that women cannot be priests, because Jesus and his disciples were men. Islam teaches that women should not have authority over men in worship, and so women are not permitted to become imams.

However both religions have important female figures, like Mary in Christianity, and Khadjiah in Islam.

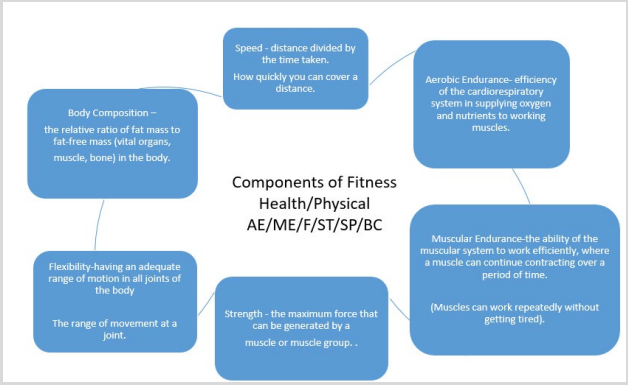
Year 9 Physical Education Spring Term Knowledge Organiser

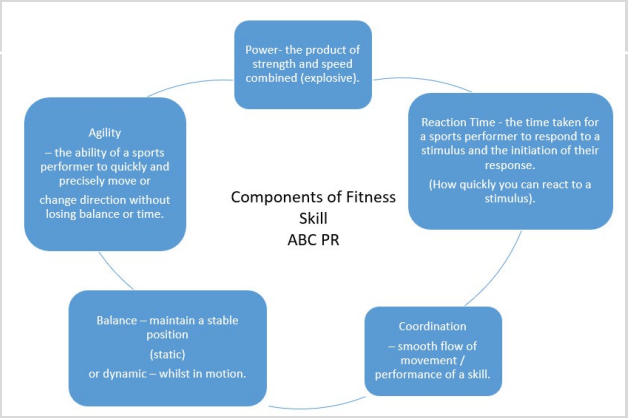
Key Vocabulary:

1	Methods of training	Different ways you can exercise the body to improve you health and well-being
2	Muscular system	The muscular system is an organ system consisting of skeletal, smooth, and cardiac muscle
3	Principles	Principles of training means exercising regularly to improve skills and fitness.
4	Cardio-respiratory system	The parts of the body that allow us to breathe and circulate oxygen.
5	Acceleration	Acceleration describes how quickly you can increase your velocity towards maximum speed.
6	Reps and sets	**Rep** = repetition of an exercise. E.G. perform 6 repetitions of an exercise before resting. **Set** = a group of repetitions (or reps) of that exercise
7	Body composition	Body composition is a method of describing what the body is made up of. Ratio of fat and fat free mass (bone / muscle).

Physiology - The human body

8 Muscular system





9 Principles of training

F – Frequency - How often your train

I - Intensity – how hard you train

T - Type – the method of training you use

T - Time – How long you train for

Body components

10 Methods of training

Aerobic Endurance Training
Continuous - a steady pace, moderate intensity 30mins+
Interval – periods of higher and lower intensity
Fartlek - form of continuous training where intensity is changed by running at different speeds or different terrains.

Circuit Training - circuit training involves a series of different activities performed at stations.

Speed Training
Interval - Work high intensity and rest
Hollow - Fast slow fast
Acceleration - Increase speed through zones

Weight Training – using free weights or resistance machines. It involves using ratios (high, medium or low) of weights, reps and sets to improve either strength, endurance or power.

Flexibility Training
Static stretches – no movement and active or passive
Dynamic – involve movement (e.g. heel flicks)

Plyometrics – exercises performed quickly to improve power

11 School……

RESPECT – BE polite and considerate
Shaking hands after the game

RESILIENCE – Positivity
Trying that skill again even though its difficult

ASPIRATION – belief in our self
What can I do to improve my performance

Year 9 Julius Caesar Knowledge Organiser

Key Vocabulary:

1	Tragedy	a play dealing with tragic events and having an unhappy ending, especially one concerning the downfall of the main character.
2	Hubris	excessive pride or self-confidence; arrogance.
3	Hamartia	a fatal flaw leading to the downfall of a tragic hero or heroine.
4	Ambition	a strong desire to do or achieve something.
5	Foreshadowing	a warning, clue or indication of (a future event).
6	Conspiracy	a secret plan by a group to do something unlawful or harmful.
7	Soliloquy	an act of speaking one's thoughts aloud when by oneself or regardless of any hearers, especially by a character in a play.
8	Wrath	extreme anger.
9	Foil	In any narrative, a foil is a character who contrasts with another character.

Key Events:

Act One	The tribunes of Rome, Marullus and Flavius, break up a gathering of citizens who want to celebrate Julius Caesar's triumphant return from war. On his way to the arena, Caesar is stopped by a stranger who warns him that he should 'Beware the Ides [15th] of March.' Fellow senators, Caius Cassius and Marcus Brutus, are suspicious of Caesar's reactions to the power he holds in the Republic. They fear he will accept offers to become Emperor. He has been gaining a lot of power recently and people treat him like a god. Cassius, a successful general himself, is jealous of Caesar. Brutus has a more balanced view of the political position. The **conspirator** Casca enters and works with Cassius to try and conspire against Caesar.
Act Two	Cassius, Casca, and their allies plant false documents to manipulate Brutus to join their cause to remove Caesar. After doing so, they visit Brutus at night in his home to persuade him of their views. There they plan Caesar's death. Brutus is troubled but refuses to confide in his devoted wife, Portia. On 15 March, Caesar's wife, Calpurnia, urges him not to go to the Senate. She has had visionary dreams and fears the portents of the overnight storms.
Act Three	Caesar is nevertheless persuaded by flattery to go to the Capitol. At the Capitol, he is stabbed by each conspirator in turn. Against Cassius's advice, Brutus allows Mark Antony to speak a funeral oration for Caesar in the market place. He is allowed under the condition that first Brutus must address the people to explain the conspirators' reasons and their fears for Caesar's ambition. After Brutus speaks, the crowd becomes calm and supports his cause. However, Antony, in his speech, questions the motives of the conspirators and reminds the crowd of Caesar's benevolent actions and of his refusal to accept the crown.
Act Four	Brutus and Cassius gather an army in Northern Greece and prepare to fight the forces led by Mark Antony. Antony has joined with Caesar's great-nephew, Octavius, and with a man called Lepidus. Away from Rome, Brutus and Cassius are filled with doubts about the future and quarrel over funds for their soldiers' pay. After making amends, they prepare to engage Antony's army at Philippi, despite Cassius' misgivings about the site. Brutus stoically receives news of his wife's suicide in Rome. He then sees Caesar's ghost as he tries to rest and is unable to sleep on the eve of the conflict.
Act Five	n the battle, the Republicans (led by Brutus) appear to be winning at first. But when Cassius' messenger's horse eems to be overtaken by the enemy, Cassius fears the worst and gets his servant to help him to a quick death. After finding Cassius's body, Brutus commits suicide. He believes this to be the only honourable option left to him. Antony, triumphant on the battlefield, praises Brutus as 'the noblest Roman of them all' and orders a formal funeral before he and Octavius return to rule in Rome.

Year 9 Food Technology Spring Term Knowledge Organiser

Key Vocabulary: The Eatwell Guide		
1	The Eatwell Guide	5 main food groups and Is suitable for most people over 2 years of age. Shows the proportions in which different groups of foods are needed in order to have a well-balanced and healthy diet. Shows proportions representative of food eaten over a day or more.
2	Hydration	Aim to drink 6-8 glasses of fluid every day. Water, lower fat milk and sugar-free drinks including tea and coffee all count. Fruit juice and smoothies also count but should be limited to no more than a combined total of 150ml per day.
3	Fibre	Dietary fibre is a type of carbohydrate found in plant foods. Food examples include wholegrain cereals and cereal products; oats; beans; lentils; fruit; vegetables; nuts; and, seeds. Dietary fibre helps to: reduce the risk of heart disease, diabetes and some cancers; help weight control; bulk up stools; prevent constipation; improve gut health. The recommended average intake for dietary fibre is 30g per day for adults.
4	Energy	
5	A balanced diet	A balanced diet is based on the Eatwell Guide. An unbalanced diet can lead to dietary related diseases.
6	Dietary fibre	A type of carbohydrate found in plant foods.
7	Composite or combination food	Much of the food people eat is in the form of dishes or meals with more than one kind of food component in them. For example, pizzas, casseroles and sandwiches are all made with ingredients from more than one food group. These are often called ‘combination’ or ‘composite’ foods.
8	Food Miles and Carbon Footprint	Food miles and where our food comes from. Carbon footprint and environmental impact.
9	Food Waste and Packaging	• Uses of packaging • Packaging and the environment • Reducing the environmental impact
10	Food Provenance	**Grown food** • Intensive farming • Organic farming • GM crops **Reared Food** • Factory farm • Free-range **Caught food** • Fishing methods • Sustainable fishing
11	• Cross Contamination and Food Safety • Bacteria and Food Poisoning	Bacteria are single-celled micro-organisms. They can be divided into 3 groups Harmless bacteria, pathogenic bacteria and food spoilage bacteria. Pathogenic means food poisoning. Bacteria does not like acids or alkaline foods and prefer pH neutral foods. Foods high in moisture and protein are perfect for bacteria.
12	Cooking Processes	Cooking processes are the different ways that we heat food before it is eaten. • Baking: to cook food in a heated oven. Make sure that you select the right temperature • Grilling: to cook food by putting it under a hot grill (like a radiator in a cooker)

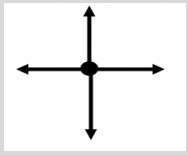
Year 9 Science Knowledge Organiser – Acceleration

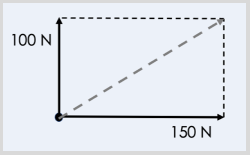
Key Vocabulary:

1	**Acceleration**	The rate of change of velocity.
2	**Action**	A description of a change in a physical system.
3	**Balanced**	Equal in size and opposite in direction.
4	**Component**	The horizontal or vertical part that makes up a diagonal vector.
5	**Constant Velocity**	When an object travels at the same speed in the same direction.
6	**Contact Force**	Is a force that acts when objects are physically touching each other.
7	**Curve**	A continuous and smooth flowing line without any sharp turns.
8	**Deceleration**	Slowing down, also known as negative acceleration.
9	**Distance**	The length of a path or length between two points.
10	**Displacement**	The change in position of an object.
11	**Gradient**	The slope of a graph.
12	**Initial Velocity**	A vector quantity that describes the velocity of an object before an acceleration.
13	**Mass**	Mass is a measurement of how much matter is in an object.
14	**Non-contact Force**	A force which acts on an object over a distance.
15	**Resultant**	The sum of two or more vectors: the result of adding two or more vectors together.
16	**Scalar**	Quantities that have magnitude (size) only.
17	**Speed**	The distance covered per unit time.
18	**Tangent**	A straight line touching a curve at a single point without crossing the line.
19	**Unbalanced**	Forces that are not equal and opposite, a non-zero resultant force.
20	**Vector**	Quantities that have both magnitude (size) and direction.
21	**Velocity**	The speed of an object in a given direction.
22	**Vertical**	Perpendicular to an x-axis (an up or down line).

23 Scalars & Vectors

1. Scalars are quantities which only have size (magnitude), such as distance, speed, mass and energy.
2. Vectors are quantities with size and direction, such as displacement, velocity, acceleration, force and weight.
3. Resultant force is a vector quantity
4. Forces acting in the same direction can be added together
5. Forces acting in opposite directions can be subtracted
6. Resultant forces can be resolved into their horizontal and vertical components





24 Acceleration

1. Acceleration is the rate of change of velocity
2. Change in velocity is calculated using final velocity minus initial velocity
3. Acceleration happens when there is change in velocity (speeding up, slowing down or a change in direction)
4. Negative acceleration (slowing down) can be called deceleration
5. The SI unit for acceleration is m/s^2
6. An object moving in a circle is accelerating because it is constantly changing direction
7. Objects near Earth's surface experience gravitational acceleration of 9.8 m/s^2
8. Air resistance/drag increases with speed

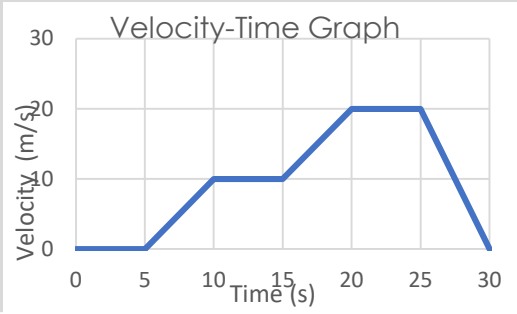
$$Acceleration = \frac{Change\ in\ velocity}{Time}$$

25 Newtons Laws

1. Newton's Third Law states that every action has an equal and opposite reaction
2. Newton's First Law states than an object's motion will not change unless acted upon by an unbalanced force
3. If the resultant force is 0 N a stationary object will remain stationary
4. If the resultant force is 0 N an object in motion will continue moving at the same velocity
5. If the resultant force is not 0 N a stationary object will accelerate in the direction of the resultant force
6. If the resultant force is not 0 N an object in motion will accelerate in the direction of the resultant force

26 Velocity-Time Graphs

1. Velocity-time graphs can be used to describe motion
2. A horizontal line shows a constant velocity
3. A straight line with a positive gradient (slope) shows that an object has a positive acceleration (speeding up)
4. A straight line with a negative gradient (slope) shows that an object has a negative acceleration/deceleration (slowing down)
5. Acceleration can be calculated by calculating the gradient
6. Distance can be calculated from the area under the graph
7. A curved line shows that acceleration is changing



Year 9 Key Stage 3 Spring Term Knowledge Organiser: Area, Scale and Measurement

Key Vocabulary

1	Measure	The act of measuring with an appropriate piece of equipment for the object/thing to be measured.
2	Accuracy	How close a measurement is to the actual value.
3	Length	The measurement from one end to the other.
4	Distance	The measurement of the space between two things.
5	Capacity	The amount that a container can hold.
6	Mass	The among of matter an object contains. The more matter an object has, the more that it will weigh.
7	Area	The amount of space a 2D shape covers.
8	Perimeter	The distance around the outside of a 2D shape. Perimeter is found by adding together the length of all the shape's sides.
9	Time	The measureable period during which an action or process continues (duration).
10	Compound Measures	A type of measure that involves two or more different units. For example: density if measured in kg/m3 or speed is measured in m/s.
11	Scale	The ratio of the distance on the map to the distance on the ground. It shows what 1cm on the map represents in the real world.
12	Bearing	The angle of direction in relation to north. Measured in degrees (in three figures) from north in a clockwise direction.

13 Units of measurements

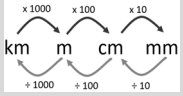
Measurement of distance /length include the units:
- Metres
- Centimetres
- Kilometres
- Millimetres
- Yards
- Feet
- Inches
- Miles

Measurement of capacity include the units:
- Litres
- Millilitres
- Centilitres

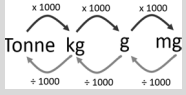
Measurements of mass include the units:
- Tonnes
- Grams
- Kilograms

Converting between units, we use can use proportional reasoning.
For example:

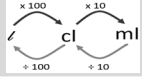
Metric length conversions:



Metric mass conversions:



Metric capacity conversions:



14 Area

Formula for the area of common 2D shapes.

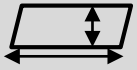
Squares and Rectangles: area = length x width

Triangles:

$$area = \frac{base \times perpendicular\ height}{2}$$

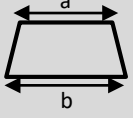
(perpendicular – at a right angle)

Parallelograms:

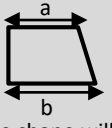


area = base x perpendicular height

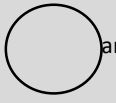
Trapezia:



$$area = \frac{1}{2} \times (a + b) \times h$$



Circles:

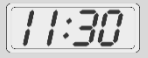


$area = \pi r^2$

For **compound shapes**, the shape will need to be broken down in the shapes that make the shape. All of the areas of the component shapes will need to be added together to find the area of the compound shape.

15 Time

Measurements of time include:
seconds, minutes, hours, days, weeks, fortnights, months, and years.



Time throughout the day is often given using an analogue or digital clock.

We often tell the time using either the 12-hour or the 24-hour clock.

12-hour clock	24-hour clock
1:25 pm	13:25
9:10 am	09:10

We can use time measurements in many everyday calculations, from knowing how long bus journey will take to calculating speed.

16 Compound Measure Calculations

Speed = $\frac{distance}{time}$

Density = $\frac{mass}{volume}$

Pressure = $\frac{force}{area}$

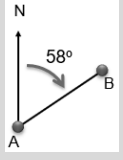
17 Map Scales

Scale drawings allow us to draw large objects on a smaller scale while keeping them accurate – for example maps.

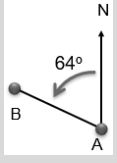
All scale drawings must have a scale on them. They are usually expressed as ratios.
Example: 1cm : 100cm This means that for every one cm on the map, the length will be 100 cm in real life.

18 Bearings

A bearing is an angle, measured clockwise from north. It must be given as three figures.



Bearing = 058°



Bearing = 360° - 64° = 296°

Bearings should be measured and drawn using a protractor. When drawing bearings, you may also be expected to use a scale to show distance from another object/place.

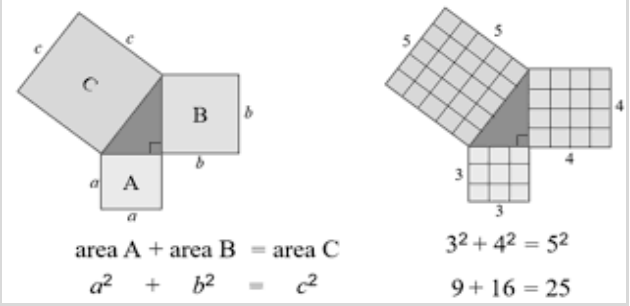
Year 9 Key Stage 3 Spring Term Knowledge Organiser - Pythagoras' Theorem and Trigonometry

Key Vocabulary:

1	Pythagoras' Theorem	In a right-angled triangle the square of the hypotenuse (long side) is equal to the sum of the square of the other two sides.
2	Trigonometry	The relationships between side lengths and angles of triangles, especially right-angled triangles.
3	Hypotenuse	The side opposite the right angle in a right-angled triangle. It is also the longest side of the right-angled triangle.
4	Square	To multiply a number by itself.
5	Square Root	The value when multiplied by itself gives a square number. E.g. the square root of 16 is 4 because 4 x 4 = 16, often seen as $\sqrt{16} = 4$. The inverse of a square number.
6	Theta θ	A letter from the Greek alphabet. It is used in Maths to represent an angle.
7	Opposite	The side opposite the angle of interest in a right-angled triangle.
8	Adjacent	The side in a right-angled triangle that is between the angle θ and the right angle.
9	Tangent	In a right-angled triangle: the length of the side opposite the angle divided by the length of the adjacent side. Tan(θ) = opposite ÷ adjacent
10	Sine	In a right-angled triangle: the length of the side opposite the angle divided by the length of the hypotenuse. Sin θ = opposite ÷ hypotenuse
11	Cosine	In a right-angled triangle: the cosine is the length of the adjacent divided by the length of the hypotenuse. Cos θ = adjacent ÷ hypotenuse

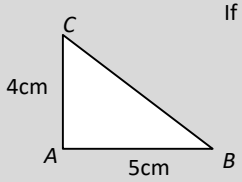
Pythagoras

11 Pythagoras's Theorem



12 Pythagoras' Theorem - finding unknown sides

Find *BC*. Answer to 1 decimal place.



If finding long side Square and ADD

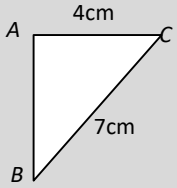
$5^2 + 4^2 = 25 + 16 = 41$

Square root

√41 = 6.4cm

13 Pythagoras' Theorem - finding unknown sides

Find *AB*. Answer to 1 decimal place.



If finding short side Square and SUBTRACT

49 – 16 = 33

Square root

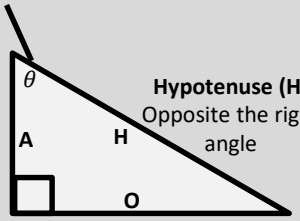
√33 = 5.7cm

Trigonometry

14 Trigonometry – labelling a triangle

In a trigonometric calculation, it usually involves an angle. Before we can start to calculate, we must label the triangle.

Theta – unknown angle



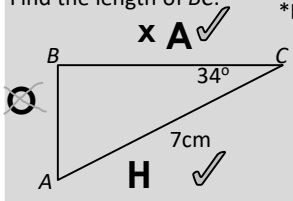
Hypotenuse (H)
Opposite the right angle

Adjacent (A)
Next to the angle in the question

Opposite (O)
Opposite the angle in the question

15 Trigonometry – finding a missing side

Find the length of *BC*.



*Label sides

SOH CAH TOA

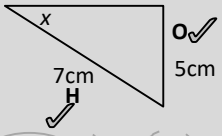
$\cos\theta = \frac{A}{H}$

$\cos 34 = \frac{x}{7}$ ×7

$7 \times \cos 34 = 5.8\text{cm}$

16 Trigonometry – finding a unknown angle

Find angle x



*Label sides

$\sin\theta = \frac{O}{H}$

$\sin x = \frac{5}{7}$

SOH CAH TOA

*2nd function for angles

$x = \sin^{-1}(5 \div 7)$

$x = 45.6°$

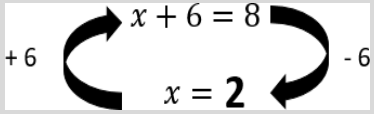
Year 9 KS3 Spring Term Knowledge Organiser – Forming and Solving Equations

Key Vocabulary

1	Expression	A collection of one or more terms that can be made up of variables, constants, operators or grouping symbols.
2	Equation	A mathematical statement where each side of the equal sign are equal to the other.
3	Inverse	The opposite of another operation. For example: + is the inverse of -
4	Solve	To find the value of a variable that makes the equation true.
5	Form	When given a mathematical situation which can be described using algebraic expressions.
6	Variable	A symbol (usually a letter) for a value that isn't known yet.
7	Coefficient	A numerical constant quantity that is placed before a variable and shows multiplying of the variable in an algebraic expression or equation.
8	Expand	To multiply each term in the bracket by the expression outside of the bracket e.g.: 4(m+7) ≡ 4m+28 Or when there are two or more brackets together, to expand, each term in each bracket is multiplied by the other. E.g.: $(x+2)(x+3) = x^2+5x+6$ It is the inverse of factorising.
9	Substitute	To replace a variable(s) in an algebraic expression with a value.
10	Evaluate	To find the value of an expression when the variable is replaced by a given number.

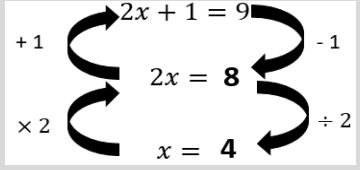
Solving one-step equations

Finding the value of an unknown, by identifying operations performed and doing the inverse operation:



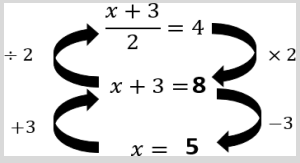
Solving two-step Equations

Finding the value of an unknown, by identifying operations performed and doing the inverse operation:



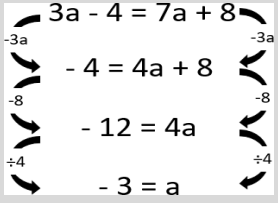
Solving Equations involving fractions.

Finding the value of an unknown. To eliminate a denominator, multiply every term by the denominator:



Solving Equations with unknowns on both sides

Add/subtract the smallest algebraic term from both sides, so that the variable is only on one side.



Forming Equations

Many of the situations where an equation is formed uses other areas of maths such as area, perimeter, money, angle facts etc.

Create an expression first using the information in the question and your mathematical knowledge.
Once you have your equation, you then solve the equation using the balance method.

Example:

James thinks of a number.
Kate's number is 14 less than James' number.
The sum of their numbers is 212.
What is Kate's number?

Let James' number be *n*, this means Kate number $n - 14$.

$$n + n - 14 = 212$$
$$2n - 14 = 212$$

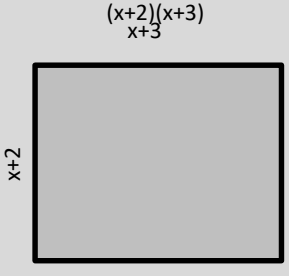
Then solve to find the value of *n*.

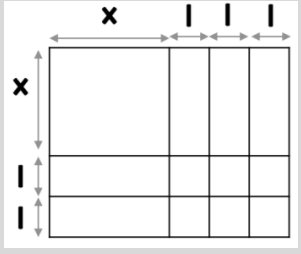
$n = 113$, so Kate's number is 99.

Area: expanding double brackets.

When calculating area, we multiply the height x width.
When multiplying dimensions using algebra, we put each expression into brackets.

We don't need to write the x sign





x^2+5x+6