Co-op Academy Walkden

Knowledge Organisers

Year 9 Term 2

What are Knowledge Organisers?

Knowledge organisers are a summary of the key knowledge and skills that pupils need for a unit of work or a curriculum subject. They are overview sheets with information broken down into bite size chunks so pupils can revise and use them within their homework or studies.

How do I use my Knowledge Organiser?

There will be several strategies to use when using Knowledge Organisers (KOs) which will include:

- Read, say, cover, write and check (RSCWC). When revising knowledge for your subjects we have discussed the importance of doing it from memory and not copying from one piece of paper to another.
- A knowledge or skill highlighting a tricky area (gaps underlined).
- Demonstrate spaced practice through revising with the knowledge organiser a little between each lesson, rather than a lot each week or fortnight.

Read	Read your Knowledge organiser and select one area to focus on at a time.
Say	Select a section and read out aloud to yourself or to a family member or friend.
Cover	Cover your knowledge organiser so you can find out which areas you need to work on.
Write	Write down all the knowledge and skills you remember in you knowledge organiser fr that section.
Check	Look back and check to see if you were correct and got it right. Correct any mistakes or missing information in red pen.

Contents

Art

ARCHITECTURE AND PHOTOGRAPHY - Knowledge Organiser

MIXED MEDIA -
Materials/Techniques and equipment

- WATERCOLOURS
- BIRO
- COLOUR PENCIL
- COLLAGE BACKGROUND
- FINE LINER
- PENCIL
- INK WASH
- TEXTURE RUBBINGS

PHOTOGRAPHY KEYWORDS:

Monochrome - a photograph or picture developed or executed in black and white

Contrast - the state of being strikingly different from something else.

Composition - the artistic arrangement of the parts of a picture.

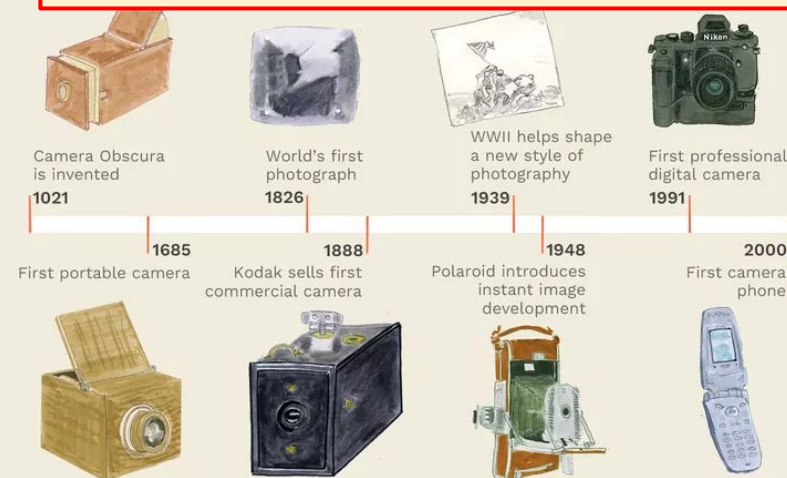**Glitch -** a sudden, usually temporary malfunction or fault

Concealed - kept secret; hidden

Layers - arrange in a layer or layers

Distorted - pulled or twisted out of shape

Fragmented - break or cause to break into fragments

THE HISTORY OF PHOTOGRAPHY

Camera Obscura is invented
1021

First portable camera
1685

World's first photograph
1826

Kodak sells first commercial camera
1888

WWII helps shape a new style of photography
1939

Polaroid introduces instant image development
1948

First professional digital camera
1991

First camera phone
2000

YEAR 9 : MIXED MEDIA

KEYWORDS

Collage – process of sticking various materials eg paper/photographs onto a backing

Composition - The arrangement of the different components on the page, layout.

Oil pastel- pigment mixed with non drying oil and wax

Sgraffito - a form of decoration made by scratching through a surface to reveal a lower layer of a contrasting colour

Observational drawing – drawing whilst observing a primary of secondary source

Mixed media - using more than one type of material for example watercolour and colour pencil

Acrylic paint – a water based paint

Hatching - an artistic technique used to create tonal or shading effects by drawing (or painting) closely spaced parallel lines.

Cross hatching - Lines placed on a angle over the top of hatching creates cross hatching

Harmonious colours - colours that are next to each other on the colour wheel.

Fineliner and water: Use a fineliner to outline the pencil details. Create tone with the fineliner pen using a hatching or cross hatching technique. Then use a slightly damp paintbrush to lightly wet the penwork and create gradients.
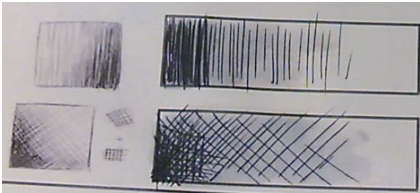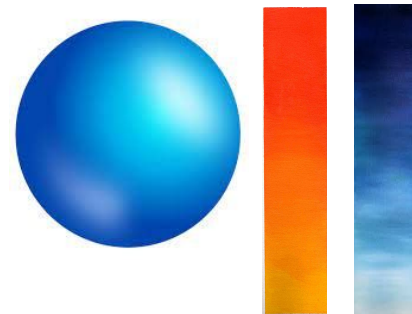
Pencil Shading: Shade in carefully to create smooth gradients and a wide range of tones. Include highlights using a rubber or letting the background paper show through. Add texture marks (dots/lines/scribble) using a sharp pencil where appropriate.

Colour pencil: Overlap colour pencil gradients in harmonious colours to create colour blends. Add texture in colour pencil using hatching/cross hatching or stippling marks.
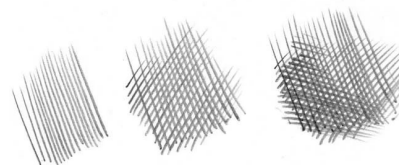
Acrylic paint: After applying the first tone smoothly to a section of your work, apply the second tone next to it and slightly overlap the paint tones. With a clean and damp brush blend the paint where the two tones meet/overlap. Keep brushstrokes in the same direction to create a smooth finish. Acrylic paint dries quickly and will only blend whilst wet.

Watercolours: Use gradients, wet in wet, washes and blending techniques to record the colours and tones you can see within the image.

Textural Pencil: Hatching and cross hatching marks can be layered to create areas of light and dark

YEAR 9 : ARCHITECTURE AND PHOTOGRAPHY

HOMEWORK

Art Homework at KS3 is set once a fortnight. Tasks should take no more than 30 minutes to complete. Pupils can expect to be set the following types of tasks:

- Keyword retrieval / definitions
- Artist analysis
- Retrieval tasks using a knowledge organiser
- Research - imagery collection / art history information
- Observational drawings
- Taking photographs
- Creating mood boards
- Skill practice worksheets
- Reading - texts about artists / art movements
- Completing classwork

Drama

Year 9 Drama Spring Term –Practitioner Knowledge Organiser

Stanislavski

Background	Russian practitioner, Konstantin Stanislavski's ideas are very influential. He believed in naturalistic performances that were as realistic as possible, and invented techniques that you can use.
The System	This term refers to the methods used by Stanislavski to foster a good performance in his actors. It focuses mainly on helping an actor recall the emotions needed for a role. Don't confuse 'method acting' with the System. Method acting is how Stanislavksi's work was interpreted by others, in particular, actors and directors in the film industry.

Berkoff

Background	Steven Berkoff A British theatre practitioner (born 1937) who is known for his experimental style. His plays often use physical theatre techniques like mime, exaggerated movement and improvisation. He believes that actors' bodies should convey the story rather than relying on sets.
Total theatre	• Is a belief that all elements of theatre are EQUAL and have the same value in contributing the effect to the audience. • Concerned with conveying emotion • To give the audience an overwhelming experience • Every aspect of theatre must have a purpose

Frantic Assembly

Theatre Company	Frantic Assembly has developed into one of the most studied and praised theatre companies working today. It was formed in 1994 by three students who were intrigued by theatre and wanted to create their own unique company. They wished to create non-naturalistic pieces through the use of movement and music, although they have always said that this should never take away from the storyline.
Mission Statement	"Our ambition is that we continue to learn and remain committed to making brave and bold theatre. At times it is physically dynamic and brutal. At others it's proudly tender and fragile."¨

Techniques

Hymn Hands	The idea of Hand Hymns is to physically interact with a partner using only each other's hands. The complexity of the movements is developed through an improvisational process – each person takes it in turns to manipulate the other person.	
Round – By- Through	A movement sequence performed with a partner – although the number of people involved can be extended. 'Round' means literally moving around a partner, 'By' consists of being parallel to your partner and 'Through' is when you physically go through their body.	
Chair Duets	This is one of Frantic Assembly's simple and accessible devising exercises used to create new material. In this, you sit next to a partner and create contact improvisation whilst seated. Chair duets require a call/response style of working. Its restrictive nature forces the performer to explore and experiment with different types of movement.	

Extension and Support - What to watch and Read.

What is Physical Theatre?

https://www.youtube.com/watch?v=P_HfdiC7tZU

https://www.youtube.com/watch?v=VjnKwTAmSNs

https://www.youtube.com/watch?v=9JzdIPSdAmE

https://www.bbc.co.uk/bitesize/guides/ztfk6sg/revision/1

Berkoff

Introduction to Berkoff

https://www.youtube.com/watch?v=wrrTaknHtuE

Read more about the Berkovian aesthetic

https://www.iainfisher.com/berkoff/berkoff-study-a5.html

Stanislavski

An article on Stanislavski background and beliefs

https://www.bl.uk/20th-century-literature/articles/an-introduction-to-stanislavski

Short Video about Stan the Man

https://www.youtube.com/watch?v=JDDitfsZS1c

Face

https://www.youtube.com/watch?v=gWjahh7F5o4

Design Technology

Briefs, Specifications, Ideas and Development

Design Briefs

A Design Brief is the statement of how you will solve the Design Problem
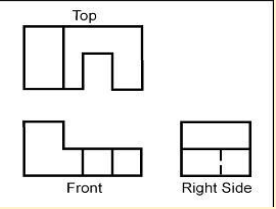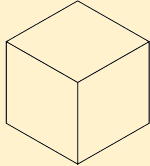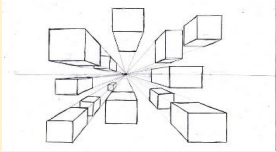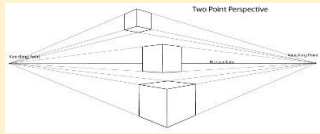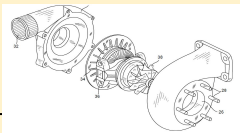It will often include:

- Constraints/ limitations
- What the product is
- Materials/processes
- Any key information you know

Design Specifications

A Design Specification is a list of requirements your product has to meet in order to be successful

It is also useful for evaluation. If your product hasn't met the Spec then it gives you a starting point for improvements.

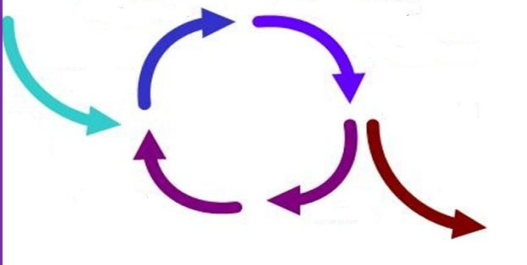|	
Aesthetics	What the product looks like? Style? Colour Scheme? Design Movement?
Customer	Who would buy it? (Age, gender, socio-economic, personality) How does the design appeal to them?
Cost	How much will it cost? (min-max) Why?
Environment	Where will it be used? Why? How will you make it suitable?
Safety	How is it safe? How will it be checked? Why must it be safe?
Size	What is the maximum or minimum size? Why?
Function	What does the product do? What features make it do that function well? How is it unique from similar products?
Materials	What is it made from? Why?
Manufacture	How might it be made? Why? What scale of production? Why?

Technique	Description/ notes	Diagram
Orthographic Projection/ Working Drawings	• Includes "Front", "Plan" and "End" 2D Views, and often an Isometric 3D View • Standardised method for scale, dimensions and line types • Great for manufacturing	
Isometric	• Common 3D sketching method • Can be drawn free-hand or using isometric paper and ruler • Angles are at 30 degrees • Great for seeing most of the products	
1-Point Perspective	• A 3D drawing method • Often used by interior designers and architects • Gives drawings depth • Only uses 1 vanishing point	
2-Point Perspective	• Used for 3D designs • Exaggerates the 3D effect • Objects can be drawn above of below the horizon line but must go to the 2 vanishing points	
Annotated Drawings/ Free and Sketches	• Quick and easy way of getting ideas down • Range of ideas can be seen • Annotation helps explain designs further	
Exploded View	• Helps see a final design of a product and all it's parts • Can see where all the parts fit • Great for manufacturers	

Modelling and Development

Modelling and development are key to testing and improving products
This can be done physically using materials like; card, foam, clay, man-made boards or virtually in **CAD**
Modelling helps the designer get feedback from the customer, check aesthetics, function, sizes and even materials and production methods and change them if needed

Design Strategies

Design Strategies are used to solve **Design Fixation**, and help develop creative design ideas.

Iterative Design

- A Proposal is made
- It is then planned and developed to meet the brief
- It is analysed and refined
- It is then tested and modelled
- Then evaluated against the brief – many versions fail but that then informs development to make the idea better
- The cycle then repeats and if the product is successful it is then made and sold on the market

Iterative Design

Advantages	Disadvantages
• Consistent testing helps solve problems earlier • Constant feedback • Easy evidence of progress	• Designers can loose sight of "the big picture" • Time consuming

User-Centred Design

- This is when designs are based on fulfilling the needs and wants of the Users/ Clients at every stage of the design process
- Questioning and testing is ongoing and is often found through interviews, questionnaires, surveys, etc

User-Centred

Advantages	Disadvantages
• User feels listened to • Makes sure the product meets their needs	• Requires extra time to get customer feedback • If focused on just one person it can limit appeal to others

Systems Approach

- Usually used for electronic products
- Often uses diagrams to show systems in a visual way
- Planning the layout for the correct sequences e.g. inputs, outputs, timings, etc
- Electronics and mechanical systems need an ordered and logical approach

Systems Approach

Advantages	Disadvantages
• Does not need specialist knowledge • Easy to communicate stages • Easy to find errors	• Sometimes over-simplifies stages • Can lead to unnecessary stages

Collaborative Approach

- Working with others to share data and solving problems and coming up with design proposals can help with creativity
- Numerous companies work in teams, and has been shown to improve the range and quality of ideas produced

Collaborative Approach

Advantages	Disadvantages
• Gets multiple opinions and a range of views • Working in groups can produce more ideas	• Can be difficult to design ideas with opposing views • Can be difficult to find time to communicate with multiple people

Energy Generation and Storage

Non-Renewable Energy Sources	This is when certain sources of energy will run out eventually
Fossil Fuels	• Coal, Oil and Gas • Burned to create steam, turned in turbines to create electricity. • Burning creates C02 which adds to **Global Warming**
Nuclear Power	• Nuclear Fission controls the reactor (that creates the electricity). This requires **Uranium** which is non-renewable • Accidents and waste can severely damage the environment and cause radiation poisoning • **Radiation poisoning** can be fatal and cause physical deformations • Nuclear waste has to be disposed of properly and is hazardous for thousands of years.

Renewable Energy Sources	This is when certain sources of energy will not run out.
Solar	• **Solar panels** are used to collect light and convert it into electricity • There is no waste and a consistent supply • However, the panels are not effective at night or in countries where there isn't a lot of sunlight
Wind	• **Turbines** harness wind energy • Not effective on non-windy days • Some people don't like turbines as they are noisy, and not attractive to look at
Hydro-Electrical	• This harnesses energy from water held behind a **dam** • Has to be created by flooding land – damaging wildlife habitats • **Tidal** energy comes from using energy from waves
Biomass	• This is fuel from natural sources e.g. crops, scrap woods and animal waste • Growing biomass crops produces oxygen and uses up C02 • However, is a very expensive method

Storing Energy

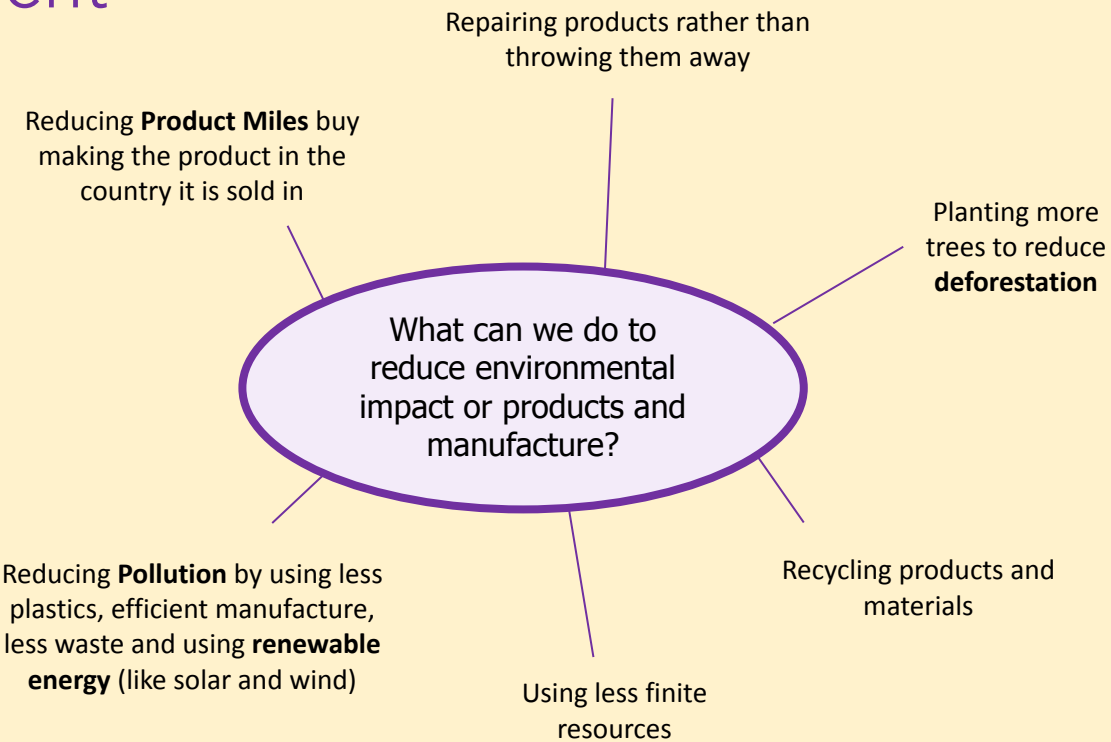**Pneumatics:** This is the production of energy using compressed gas or air. E.g. Pistons in an engine

Hydraulics: Like a Pneumatic system, but uses water or oil under pressure. E.g. Wheelchair lifts

Kinetic: Energy that is generated by movement. This is stored by items like springs in a "clickable" pen or balloons,

Batteries: Electrical power can be stored in batteries. Rechargeable batteries are becoming increasingly popular.

Environment

The 6Rs	Meaning
Reuse	To use a product again either for the same purpose or a different one
Reduce	To have less of material/packaging/pollution when making products by making them more efficient
Recycle	Breaking down and forming the material into another product
Refuse	Customers not buying or supporting products that make an environmental impact
Rethink	Designers and customer rethinking their decisions when making and buying products.
Repair	Fixing a product rather than throwing it away. Extending its life rather than using more resources to make another

Often products are **Designed for Maintenance** so can easily be repaired. E.g. Using screws so even non-specialists can take a product apart, or using components that can easily be replaced like fuses or batteries |

Reducing **Product Miles** buy making the product in the country it is sold in

Repairing products rather than throwing them away

Planting more trees to reduce **deforestation**

What can we do to reduce environmental impact or products and manufacture?

Reducing **Pollution** by using less plastics, efficient manufacture, less waste and using **renewable energy** (like solar and wind)

Recycling products and materials

Using less finite resources

Life Cycle Assessment

This is when a designer looks at the environmental impact a product makes over its life time and how it could be reduced. Including:

- Impact of materials

- Impact of processes

- Product Miles (how far a product has to travel to get from factory to consumer)

- Impact while in use

- Impact when disposed of (6Rs)

Sustainability is maintaining our planet and its resources and making a minimal negative impact

| Finite Resources
Will run out of eventually | Non-finite Resources
Can be re-grown and re-bread. Will not run out of |
|---|---|
| Plastics | Paper |
| Metals | Boards |
| Polymers (Textiles) | Natural Timbers |
| Coal, Gas and Oil | Cotton |
| | Leather |

| Planned Obsolescence | This is where products "die" after a certain amount of time. E.g. Disposable cups, Phones, Lightbulbs, Printer Ink, etc
This can have a big environmental impact as customers are throwing away lots of products, and resources are being used to create new ones. |
|---|---|

Finishes, Standard Components, Accuracy and Process Orders

Finishes

Finishes are used to improve the **aesthetics** and **durability** of products

Material Type	Finishes Used	
Papers and Boards	• Paints • Varnishes • Laminating	• Plastic coating • Wax coating
Timbers and Boards	• Paints • Varnishes • Wax and Polish	• Staining • Oil
Metals and Alloys	• Painting • Lacquering • Electroplating • Galvanzing	• Polishing • Plastic Coating • Powder Coating
Plastics	• Polishing • Painting • Decals (stickers)	

Standard Components

Standard components are parts or components manufactured in the 1000s+
They are readily available, don't require specialist knowledge or tools to replace them and are universally recognised

Material Type	Components used	
Papers and Boards	• Staples • Clips • Split pins	
Timbers and Boards	• Nails • Screws	• Panel Pins • Hinges
Metals and Alloys	• Nuts and bolts • Screw	• Rivet • Washer
Plastics	• Plastic hinges	

Tolerances

• The total amount a specific dimension or property is permitted to vary
This can apply to hole depth, length, angle, thickness, weight and elasticity
A gauge can be inserted into a gap or hole to check if the sizes fall within tolerance
If parts do not fit within the specified tolerances they are discarded or recycled

Quality Control and Quality Assurance

• QC is *product* oriented
Quality control is where products are regularly tested (during and after manufacture) to ensure they meet the defined set of quality criteria

• QA is *process* oriented
Quality assurance is ensuring that the processes used to test the product have been done correctly and consistently
You can test a product all you like, but if the tests are wrong/ inconsistent with each other than the results are invalid

• Below are examples of Quality Assurance symbols:
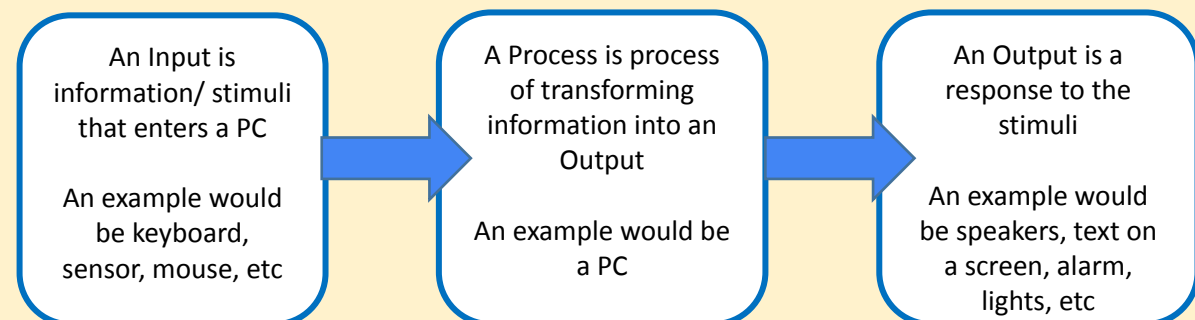
European Conformity   BSI Kitemark   Lion Mark   Registration Mark

Process Orders

| An Input is information/ stimuli that enters a PC

An example would be keyboard, sensor, mouse, etc | → | A Process is process of transforming information into an Output

An example would be a PC | → | An Output is a response to the stimuli

An example would be speakers, text on a screen, alarm, lights, etc |

Industry and Enterprise

Automation

This is when machines and robotics help make products or make them for you.

Often this is done by **CAD (Computer Aided Design)** and **CAM (Computer Aided Manufacture)** and **Computer Numerical Control (CNC)**

This helps products be made quicker, with more accuracy. Reducing errors humans make to products.

However, these machines are expensive to buy, need specialist training to use and need constant maintenance to keep them working properly

Virtual Marketing

This is when websites, social media and email are used to promote and sell products. This has become very popular in recent years, with big social media apps being funded by advertisers

Companies can also pay search engines to push their company further to the top of the results page, so customers are more likely to click it.

Cooperatives

A Cooperative is an Enterprise that is run by members that are part of the workforce or customers.

This means the organisation is democratic and often supports the local community. They are set-up to protect the rights of their members and ensure the same rules apply to everyone.

Your school is part of the Co-op, the world's largest Cooperative.

Enterprise

This is when an idea is developed into a business and produces a viable product.

Often, one of the biggest enterprises in in apps for smartphones

To make sure ideas are protected from being copied, a **Patent** can be applied for. This legally protects your idea on invention from being stolen.

Crowdfunding

This is where ideas are funded by large groups of ordinary people.

www.Kickstarter.com is a good example of this.

Fair Trade

This is an organisation that promotes fair pay, working conditions and better trade with farmers in developing countries

You can tell when something is Fairtrade as it will often have the symbol on the product or packaging. Common Fairtrade items include; bananas, cotton and chocolate.


FAIRTRADE

Modern and Smart Materials

Modern Materials are materials that have been developed recently

Material	Key info	Examples
Corn-starch Polymers	These are plant-based polymers that are a replacement for plastics that are **biodegradable** but cannot be recycled.	Plastic bottles, tubs, food containers, etc
Flexible MDF	Made in the same way as normal MDF but with grooves cut into the surface so it is flexible. **Flexiply** is the same but for Plywood. These can easily be shaped into curves	Modern furniture, interior walls and room dividers
Titanium	High strength to weight ratio. Doesn't corrode or rust. Suitable for medical use as its hypo-allergneic	Prosthetics, medical applications, sports cars, etc
Kevlar	A woven polymer with a high strength to weight ratio.	Bullet-proof vests, tyres, helmets, etc

Smart Materials are materials that change and react to the stimuli

Material	Key info	Examples
Thermochromic Pigments	Change colour in reaction to heat	Kettles, baby bottles, etc
Photochromic Pigments	Change colour in reaction to light	Colour changing glasses, windows, etc
Shape Memory Alloy	Returns to its original shape, in reaction to heat	Braces and glasses
Polymorph	Granules that once exposed to hot water, become a modelling material (like a dough or clay)	Modelling and repairs

Papers and Boards

Papers and Boards come from trees.
The Stock forms for papers are: rolls, sheets, A4, A3, etc

Material	Key info	Uses/ Examples
Cartridge Paper	Thick white paper, completely opaque and more expensive than photocopy paper	Sketching, ink drawings
Layout Paper	Light, semi-translucent, good for blending inks and artist markers	Sketching, drawing and some tracing
Corrugated Cardboard	Strong but light. Rigid triangles of card sandwiched between a top and bottom layer.	Outer packaging, food packaging
Duplex Board	Light card with white outside layers. Waxy coating can be added	Cheap packaging. If waxy coating is applied, can be used for food
Foil-lined Board	White card coated with a thin aluminium layer. Foil is great for insulation and water resistance	Takeaway containers
Solid White Board	High-quality white card with a smooth finish. Stiff and holds colours well	Greetings cards, packaging and advertising

Primary Processing of Papers and Boards
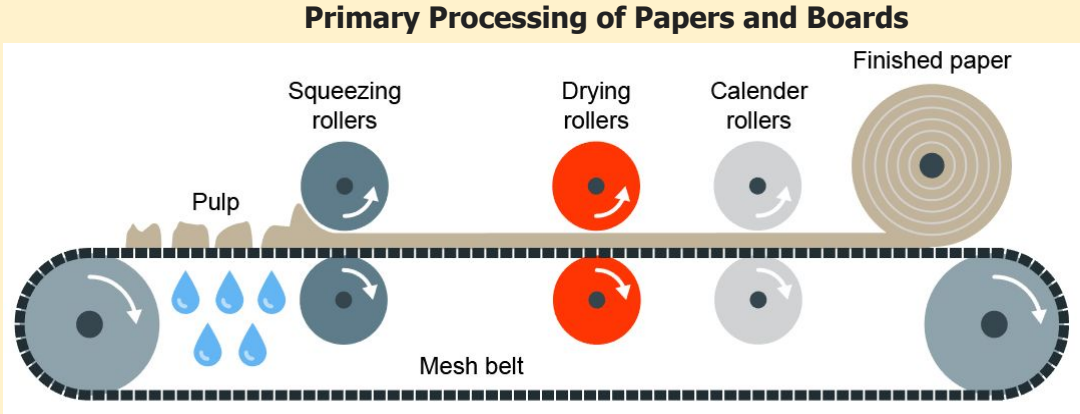
Paper is made by first making pulp. Pulp is a mix of tree fibres and water. This is cooked and bleached white, and adding any other additives.
The pulp is then drained and goes through **Calendering** where the pulp is drained and goes through rollers to convert it to its stock forms

Timbers and Boards

Natural Timbers

Softwoods are generally cheaper than hardwoods as they are more available, since they grow quicker.

But because man-made boards are manufactured they are cheaper than timbers. Man-made boards also come in a better variety of sizes since they don't depend on tree growth.

Stock forms for both include; sheets, dowel, planks, etc

Hardwoods come from **Deciduous Trees.** These trees loose leaves in winter and grow fruit and flowers in spring		
Material	**Key info**	**Examples**
Ash	Flexible, tough and shock resistant	Sports equipment Tool Handles
Beech	Fine finish, tough and durable	Toys, furniture and veneers
Mahogany	Easily worked, durable, high quality finish	High-end furniture
Balsa	Very soft and spongy. Light	Modelling
Oak	Tough, durable and hard	Flooring, furniture and veneers

| **Softwoods** come from **Coniferous Trees.** These have thin, needle-like leaves and grow all year round. Often have pine cones and sometimes nuts and seeds		
Material	**Key info**	**Examples**
Larch	Durable, tough, good water resistance and finishes well	Furniture, flooring and used outdoors
Pine	Light, easy to work with but can split	Cheap furniture, construction and decking
Spruce	Easy to work with, high stiffness but can decay quickly	Furniture, musical instruments and construction

Man-Made Boards

Manufactured boards are made from wood chips/dust/ layers and glue.		
Material	**Key info**	**Examples**
Chipboard	Prone to chipping but good compressive strength. Not-water resistant	Flooring, low-end furniture, flat-pack
MDF	Rigid and stable. Easy to finish. Absorbs liquid easily	Flat-pack furniture and kitchen unites
Plywood	Very stable. Exterior veneer can be used from more expensive woods	Shelving, furniture, toys

Primary Processing of Papers and Boards

Trees are cut then converted into planks by cut using saws
It is then seasoned to reduce the moisture in the wood. This is done by either:

Air-drying – Planks are stacked and air allowed to circulate; causing evaporation
Kiln-drying – Where planks are put into a kiln and dried rapidly. This process is more costly than air-drying
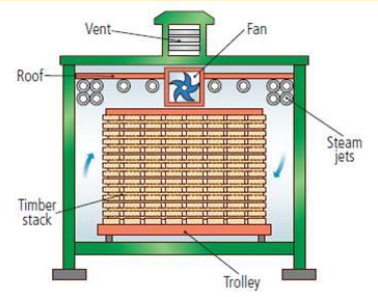
Manufactured boards can be either be made by lamination or compression

Lamination – Layers of woods and adhesive are layered and compressed together. Usually with a more expensive wooden veneer on the top

Compression – Wood is shredded, heated and compressed with adhesive under extreme pressure

Metals, Alloys and Plastics

Metals

Metals come from ores in the ground. **Stock forms** are sheets, bars and rods

Ferrous Metals contain iron and are magnetic and rust

Material	Key info	Examples
Low Carbon Steel	Tough and ductile and easily machined and welded	Construction, screws, cars
High Carbon Steel	Hard and wears well	Tools, blades and knives
Cast Iron	Hard but brittle. Easily cast but hard to machine	Pots, pans, vices

Non-Ferrous Metals do not contain iron, aren't magnetic and don't rust

Material	Key info	Examples
Aluminium	Light, high strength to weight ratio and ductile	Pots, pans, cars, cans
Copper	Ductile, malleable and good conductor	Plumbing supplies and cables
Tin	Soft, malleable and good conductor	Used as a protective coating

Alloys are mixtures of 2 or more metals to get the best of their properties

Material	Key info	Examples
Brass	Malleable and easy to cast	Musical instruments, plumbing
Stainless Steel	Doesn't rust, hard and smooth	Cutlery, medical tools, etc

Plastics

Plastics come from crude oil. **Stock forms** are sheets, powders, granules and rods

Thermoplastics can be reheated and reshaped and infinite amount of times

Material	Key info	Examples
PET	Easily **blow moulded,** food safe and easily recycled	Bottles, packaging, etc
PVC	Flexible, tough, easily **extruded**	Pipes, tape, hard hats
HIPS	Flexible, lightweight, food safe and easily **vacuum formed**	Containers and yoghurt pots
Acrylic	Tough, brittle, easily scratched	Car lights, baths, displays/ signs

Thermosets once heated and set cannot be reshaped

Material	Key info	Examples
Melamine Formaldehyde	Food safe, hygienic, hard and brittle	Kitchenware and work surfaces
Urea Formalehyde	Good insulator, hard and brittle	Electrical casings, buttons and handles
Polyester Resin	Strong, heat resistant, can be transparent	Coatings, casings

Primary Processing of Metals and Alloys

Metals are mined from the earth and then go through an extraction process
Extraction happens by putting the ore in a blast furnace
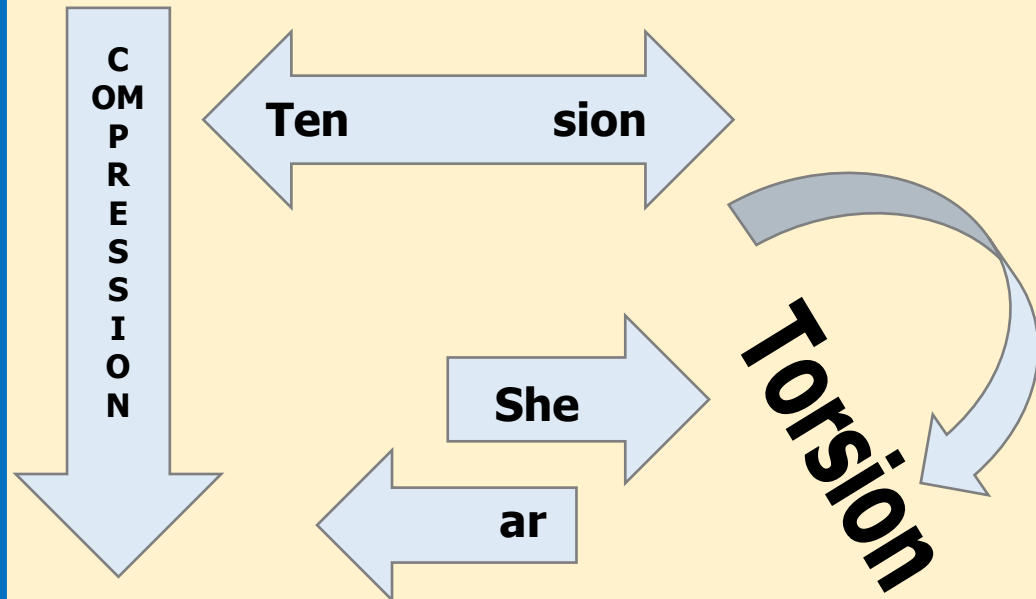The metal is then separated from the waste material

Primary Processing of Plastics

Crude oil is extracted from the earth and then processes into different types of fuels, etc. This is called **Fractional Distillation**
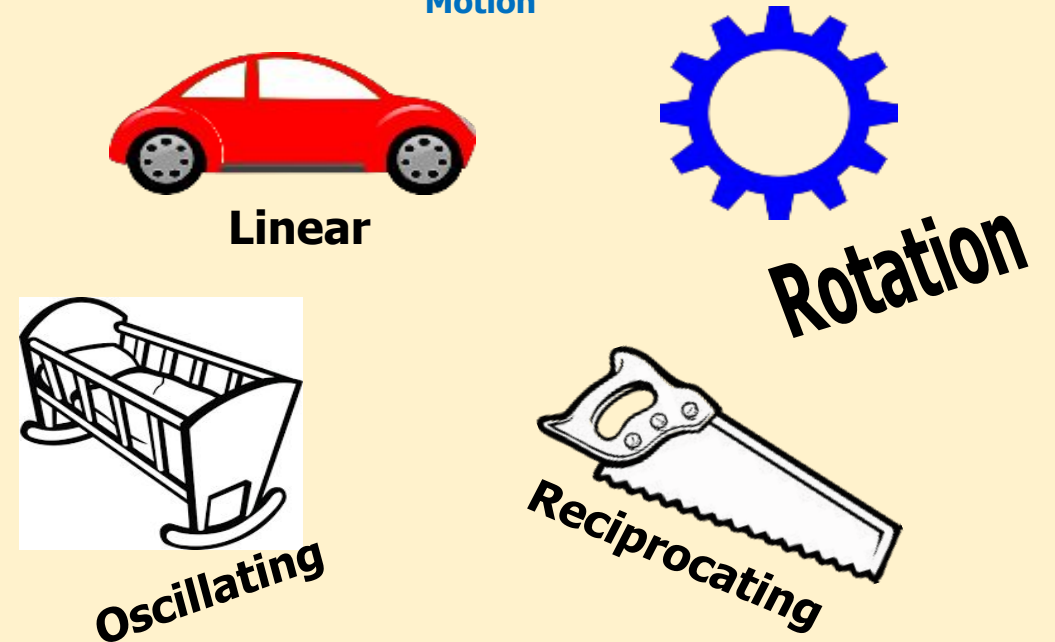
A process called **Cracking** then converts the large hydrocarbon molecules into plastics
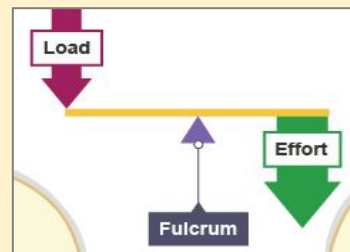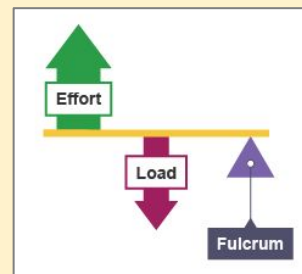
Mechanical Systems

Forces

C
O
M
P
R
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S
S
I
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N
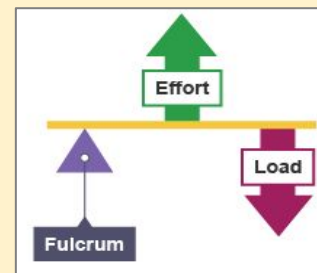
Ten   sion

She

ar

Torsion

Motion

Linear

Rotation

Oscillating

Reciprocating

Levers

Load

Effort

Fulcrum

1st Class Lever: Fulcrum in the centre
E.g. Scissors

Effort

Load

Fulcrum

2nd Class Lever: Load in the centre
E.g. wheelbarrow

Effort

Load

Fulcrum

3rd Class Lever: Force in the centre
E.g. Lifting a dumbbell

Gears and Pulleys

Gears have teeth that mesh together with each other (like teeth on a zip)

They mainly focus on rotary motion on tools and machinery e.g. car steering and pillar drills

A Pulley is a grooved wheel, that has a belt running through it

This uses rotary motion and is often used to help with heavy loads, and transfer force from a motor to a tool in machines like drills, etc

Bevel Gear

Spur Gear

WORM WHEEL
WORM
MOTOR

Rack and Pinion

Worm and Wheel
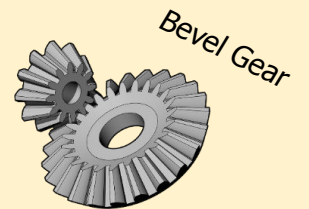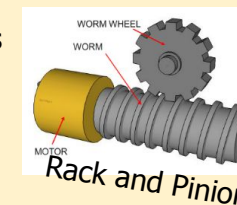
People. Society and Culture

Market Pull and Technology Push

Technology Push is the development of new technology, materials and manufacturing methods to create new products or improve old ones.

Examples include; Smart Phones, Electricity, Mass Production, etc

Market pull is the demand from consumers for new products and improvements in old ones; this is often found via reviews, polls, surveys, etc

Examples include; Product **Aesthetics,** making products easier to use, etc

Cultures, Faith and Belief

Different groups of people have different interests and have to be catered for.
Different countries and cultures also react to products differently.
E.g. In India McDonalds don't sell beef burgers as it has a large Hindu population, and cows are seen as sacred – in contrast the UK sells its most amount of fish and chips on a Friday as it is a Christian tradition to not eat meat on that day.

Case Study: £5 note

Hindu, Sikh and some other faith-based communities may choose to follow a vegetarian diet, and this is part of their culture. In addition to not eating meat, many followers of these faiths, as well as vegans and vegetarians, take every opportunity to avoid using animal products in their day-to-day lives.

The revelation in 2016 that the new polymer Bank of England £5 note contained tallow, an animal fat-based substance, upset a number of communities. There was a prompt call for the Bank of England to find an alternative way to produce the note and in the first two days of an official petition well over 100,000 signatures were received.

Shortly after the Bank of England admitted that the new polymer £5 note contained the animal by-product, some establishments refused to take the notes as a method of payment. One café owner was repulsed by the idea that the note contained tallow and believed that her customers supported her view. They received no complaints.

The Bank of England say they currently have no plans to change the manufacturing process.
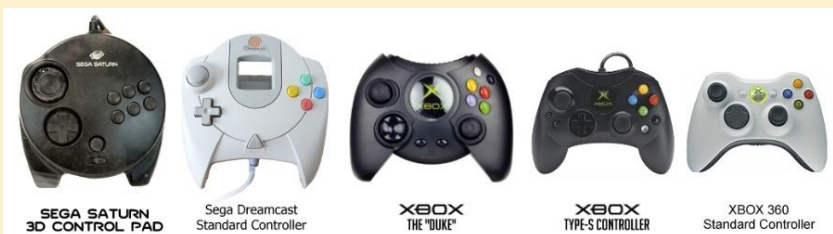
Fashion and Trends

Fashion and Trends will change quickly, and you can see major differences in fashions over decades.

Designers have to make sure their products meet the fashion and trends of the area they are designing and selling the product to.

The change of products over time is called **Product Evolution**. This is caused by Market Pull, Technology Push and Fashion and Trends.

SEGA SATURN 3D CONTROL PAD — Sega Dreamcast Standard Controller — XBOX THE "DUKE" — XBOX TYPE-S CONTROLLER — XBOX 360 Standard Controller

Some products are seen as **timeless.** These products are called **Iconic Designs.** These products are timeless because they were innovative, set a bench mark for following products, changed their industry and are often copied.
Examples include; iPod, iPhone, Angle-Poise Lamp, Swiss Army Knife, Converse Shoes, Levi's Jeans, Classic Mini Cooper
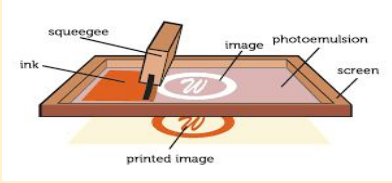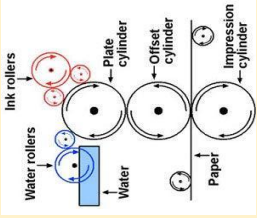

SPITFIRE R.J. MITCHELL 1936 — STRATOCASTER GUITAR Electric Guitar Designed By Leo Fender, George Fullerton, and Freddie Tavares in 1954 — SIR ALEC ISSIGONIS ORIGINAL MINI 1959 — SONY WALKMAN Walkman TPS-L2 (1979) 1979 — iPod Touch 2007

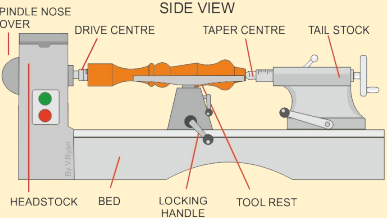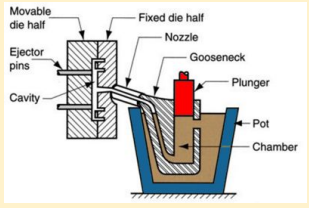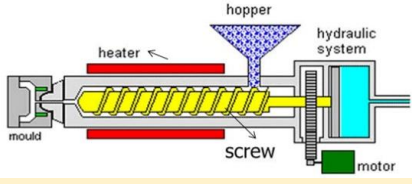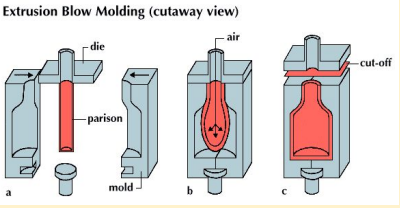## Inclusive vs. Exclusive Design

Inclusive Design: The aim to create a product that as many people as possible can use

Examples include; Cars, Doorframes, Adjustable Products, etc

Exclusive Design: The aim to create a product for a particular group and their needs

Examples include; Car seats for babies, Wheelchairs, Stair Lifts

Production Processes

Name of Process	Diagram	Material	Products Made	Key info
Screen-printing		Papers and Textiles	Posters, signs and t-shirts	Screen printing places paint on top of a screen. The screen has a stencil embedded in it, so when the paint is passed across it the desired shape is printed underneath. Good process in one-off and batch production as often done by hand
Offset Lithography		Papers and card (thin, flexible plastics)	Posters, newspapers, plastics bags	Rollers containing the colours and water go onto the plate cylinder. The water stops the colours sticking to certain places, creating the shape. The shape is transferred between rollers and onto the material. Can be used at batch and mass production
Lathe Turning		Wood and metal	Chair legs, baseball bats (cylindrical items)	Material is placed between the tail stock and the headstock and spun at high speed. The material is then cut using specialist tools (either by hand or my automated machinery) to the desired shape. Can be used in one-off and batch production
Die Casting		Metal	Car parts, engine components, etc	Molten metal is poured into a chamber and a plunger forces the metal through the nozzle into the mould. Unlike sand casting, the mould is reusable. Good process for both one-of and batch production
Injection Moulding		Plastics	Chairs, toys, etc	Plastic granules are poured into the hopper and onto the screw. The screw moves the material towards the heater where it turns into a liquid. The liquid is then forced into the mould, cooled and released. Great process for mass production as it makes 100s+ of products at once, to a identical standard.
Blow Moulding		Plastics	Plastic bottles	A Plastic parison is heated and put into the mould. The parison is then filled with air (like blowing up a balloon) and is forced to fit the mould shape. It is then cooled and then released. This is a great process for mass producing bottles.

Production Techniques and Systems

CAD Computer Aided Design

Examples; 2D Design, Autodesk Inventor, Fusion 360, Photoshop, etc

Advantages	Disadvantages
• Easy to change designs • Designs are easily saved and sent • Can be worked on by multiple people simultaneously • Can be used for virtual testing • Can produce high-quality designs	• Complex and time-consuming to learn • Expensive to buy • PCs can crash or be hacked – causing work to be lost • Takes up PC memory

CAM Computer Aided Manufacture

Examples; 3D Printing, Laser Cutting, CNC Router, Automated Machines and Robotics, etc

Advantages	Disadvantages
• Faster and more accurate than traditional tools • Repetitive accuracy/ consistent outcomes • Machines can run 24/7	• Expensive to buy the equipment, etc • Training takes cost and time • Need specialists to maintain and repair the machines • Dependence on CAM can cause unemployment

Flexible Manufacturing Systems

This is where **automated machines** are adaptable and can produce different products if needed.

If a manufacture is making a product with machines that are just dedicated to specific tasks they have to be reprogrammed and re-tooled before changing to a new task. This is time consuming and expensive.

Examples include; CNC Machines, 3D Printers, Laser Cutters, Robotic arms, etc

Lean Manufacturing

This is where waste and energy is kept to a minimum.
This helps manufacturers save money and resources in production, as well as helping minimise the **environmental impact** of producing products.

Just-in-Time (JIT) Manufacture

This is where manufacturers only order materials, parts, etc when needed. The customer's order triggers the production process and the resources needed for that order are the only ones bought.

This can be used in any **scale of production** but is particularly useful for one-off production.

Advantages	Disadvantages
• Saves on warehouse and storage costs • Money is not tied-up in stock • Little/minimal waste • Customer often pays in advance so money is secure before production	• All production stops if a part/ material is missing • Needs to have a fast, reliable and good quality supply chain to work properly • Can be time-consuming

Scales of Production

Name/ Type	How many it makes	Key Info	Examples of Products
One-off Production	1	• Also known as Bespoke or Prototype manufacture • Custom-made products • Specialist workers/ skills • Specialist machines and materials • High Quality but expensive	• Towers / Bridges • One-off Houses • Custom made clothes
Batch	10s-1000s	• Uses a mix of workers and machinery • Uses jigs, moulds and templates to help make identical products • Stations of workers e.g. cutting station, painting station, etc • Can have some variation e.g. colour, finish, flavour	• Baked foods • Limited edition car • Socks • Chairs
Mass	10,000s - 100,000s	• Big assembly lines (and sub-assembly lines) • Heavily automated • Standard and identical products • Little worker input	• Cars • Bottles • Microchips • Plain shirts
Continuous	100,00s +	• 24/7 production • Heavily automated • Standard and identical products • Little worker input	• Energy • Water • Paper • Plastic

One-off Production

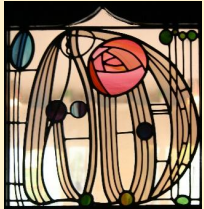| Advantages	Disadvantages
• Custom made • High Quality Materials • High Quality Craftsmanship	• Time consuming • Specialist training for workers • Expensive to buy

Batch Production

Advantages	Disadvantages
• Lower cost than one-off • Jigs, moulds and templates help products look identical • Can have some variety	• High storage costs • Jugs, moulds and templates have to be checked • Workers can become bored on their station

Mass Production

Advantages	Disadvantages
• Large amounts made at once • All products are identical and to same standard • Using automation reduced human error	• Initial starting costs are high • If production line stops, the product can't be made • Workers become bored monitoring machines and repetitive tasks

Continuous Production

Advantages	Disadvantages
• Large amounts made at once • All products are identical and to same standard • Using automation reduced human error	• Initial starting costs are high • If production line stops, the product can't be made • Workers become bored monitoring machines and repetitive tasks

Work of others and Customer Research

Image/ Example	Designer	Design Movement	Key info
	William Morris	Arts and Crafts	• British designer in 1880s • Simple natural crafts • Useful and beautiful products (wallpapers, cushions, etc)
	Charles Rennie Mackintosh	Art Nouveau	• Scottish designer in 1860s – 1920s • Known for light and shadow • Created stained glass and furniture • Inspired by nature and geometric lines
	Ettore Stottas	Memphis	• Italian designer in the 1950s/60s • Enjoyed making everyday objects wacky and bold • Used lots of bold colours and black lines

Image/ Example	Brand	Key info
	Alessi	• Italian Design Company • Homeware and kitchen utensils • "Post-modern" style • Phillipe Starke is a major designer
	Apple	• USA-based tech company • Famous for **iconic designs** of iPod and iPhone • Steve Jobs and Jonathan Ive are major designers • Known for innovative and modern design
	Dyson	• British engineering company • Famous for vacuum cleaners and innovative technology • James Dyson is a major designer

Research

Product Analysis

Case studies

Interviews

What methods of research can be used to find information?

Questionnaires and surveys

Materials testing

Social media and email

Research can be divided into 2 categories; **Primary Research** and **Secondary Research**.
Primary is research you complete yourself.
Secondary is research from resources others can gathered e.g. books, magazines and internet

Primary research is generally more reliable as it is done by the person using it and can double-check the data

Another key piece of research, is **Anthropometrics and Ergonomics.** This helps develop the sizes of products, etc to make sure it fits the User

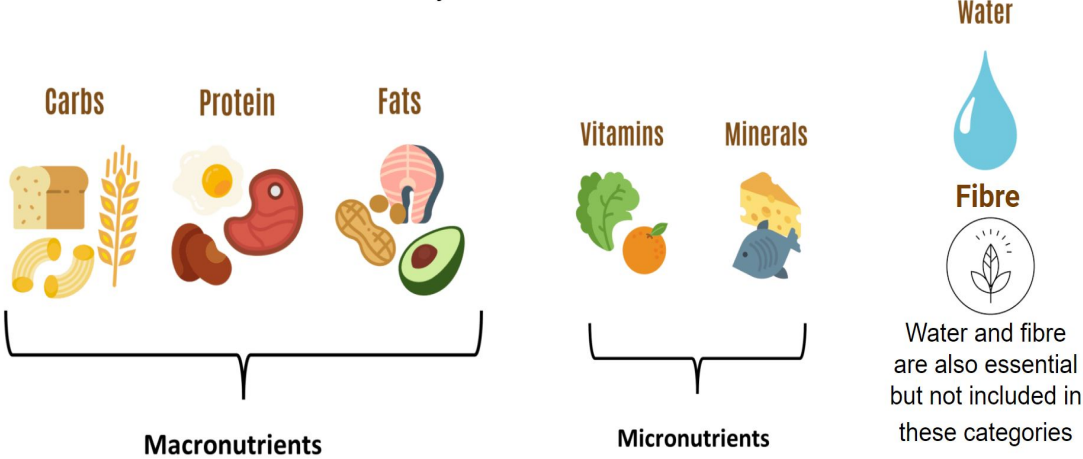|	
Anthropometrics	The study of measurements of the human body. E.g. Knowing the grip width of a palm, if designing a new travel coffee cup
Ergonomics	The application of anthropometrics to ensure products are safe and comfortable to use. This can also include; size, material, appearance, brightness, sound and texture. E.g. making sure the travel cup is the correct size, and an insulating smooth material to make it comfortable to hold for long periods

Food Technology & Nutrition

Nutrition

There 5 main nutrients our body needs in order to function:

Carbs Protein Fats Vitamins Minerals Water

Macronutrients   Micronutrients

Fibre

Water and fibre are also essential but not included in these categories

Micronutrients

Vitamins		
Fat soluble	Fat soluble vitamins are absorbed along with the fats you eat. They can be stored.	Vitamin A,D,E,K
Water soluble	Water soluble vitamins are dissolved in the water in your body. They are easily lost (ie through urine) and need to be replenished often	Vitamin B: liver, seafood, eggs, dairy products, leafy greens. Vitamin C: Oranges, strawberries, broccoli, peppers, potatoes
Minerals		
Trace	Necessary for cognitive function, hormone balance, restorative sleep, skin and hair health, gut health, and immune function.	iron, manganese, copper, iodine, zinc, cobalt, fluoride and selenium
Macro	Play an important role in metabolic processes, and participate in almost all processes that occur in the body.	calcium, phosphorus, magnesium, sodium, potassium, chloride, and sulfur

Macronutrients

Carbohydrates		
		Sources
Complex / Starchy	Provide the body with energy, released slowly.	Potatoes, rice, whole grain bread, pasta
Simple / Sugary	Provide the body with a quick burst of energy.	Sweets, chocolate, white bread
Proteins		
HVB (high biological value)	Support muscle growth and repair, contains all essential amino acids.	Chicken, milk, fish , eggs, seafood
LBV (Low Biological value)	Support muscle growth and repair, missing some essential amino acids.	Beans, nuts, rice, peas, lentils
Fats		
Saturated / good	Insulates the body and protects internal organs, too much can raise your cholesterol and put you at risk of coronary heart disease.	Red meat, butter, lard, bacon, cheese
Unsaturated / bad	Insulates the body and protects internal organs. Can improve your cholesterol levels and stabilize heart rhythms.	Avocado, oil fish, olive oil, olives, nuts.

Macronutrients	Nutrients needed in **large** amounts
Micronutrients	Nutrients needed in **small** amounts

Nutritional needs vary at each life stage.

English

Year 9 Autumn: Class and Injustice

Blood Brothers: Plot

Mrs Johnstone, a struggling single mother of seven, finds out that she is pregnant with twins. Her employer, Mrs Lyons persuades Mrs Johnstone to give her one of the babies.
Mrs Lyons takes Edward and brings him up as her own, convincing her husband this is true. Mrs Johnstone goes back to work but fusses over Edward, leading to Mrs Lyons firing her.
Aged seven, Mickey and Edward meet and become best friends, along with Mickey's neighbour Linda. The three get into trouble with the police when they begin to throw stones at windows.
Scared of Edward becoming close to his biological family, Mrs Lyons convinces her husband to move the family to the countryside. Soon afterwards, the Johnstones (and Linda's family) are rehoused by the council.
As teenagers, Mickey and Edward meet again and they rekindle their friendship. Linda and the boys remain close throughout their teenage years before Edward goes to university.
After marrying a pregnant Linda, Mickey loses his factory job. Unemployed, Mickey is involved in a crime with one of his brothers, Sammy, and both are sent to prison.
Mickey becomes depressed and takes pills to help him cope, which he continues to take after being released.
After Mickey comes out of prison and starts a new job, Edward and Linda start a light romance. Mickey finds out and is furious so he finds Sammy's gun and goes to find Edward at his workplace, the town hall.
Mrs Johnstone follows Mickey and tells him in front of Edward that they are twins. The police also arrive.
Mickey waves the gun around and it accidentally goes off, killing Edward. The police shoot Mickey. The twins both lie dead.

Characters	Themes	Key Vocabulary
Mickey Edward The Narrator Linda Mrs Johnstone Mrs Lyons Mr Lyons Sammy	Education Prejudice & injustice Social deprivation Fate Identity Growing up Violence Class divide Superstition	**Cyclical structure:** The story ends where it began, as events eventually lead back to the imagery, event, or actual scene that begins the tale. **Motif:** A symbolic image or idea that appears frequently in a story. **Symbolism:** An image, object, idea or symbol is used to represent something other than its literal meaning. **Greek chorus:** A group of actors who described and commented upon the main action of a play, often through song. **Thesis statement:** A thesis statement carefully lays out the main point or claim in an academic essay. **Dramatic irony:** A literary technique, originally used in Greek tragedy, by which the full significance of a character's words or actions is clear to the audience or reader although unknown to the character.

Geography

Keywords

Air Pollution: is the name for extremely small particles and gases in the **air** which can cause harm if you breathe them in

Consumers people who buy and use products

Contrasts varied physical environments and cultural differences

Export A good that is sold to another country

HEP: **H**ydro**E**lectric **P**ower

Import a good that was produced in another country

Industrialisation shift from primary industry to manufacturing industry

Interconnected shared technologies e.g. internet connections and transport routes

Interdependent Countries rely on each other for trade to promote profits

Superpower A large country with a large population, strong economy, political and cultural influence.

TNC: TransNational Corporation, a company which has factories and retail outlets in several continents.

Urbanisation increasing number of people living in towns and cities

Sustainability
China is home to world's largest HEP dam - Three gorges on Yangtze river
Benefits are created as renewable source of electricity is created for 20 million home
Costs include people being displaced for creation of reservoir, sewage contaminating waters and high cost to remove rubbish trapped by dam

China's industrial growth
Cause: Population of 1.3billion provides a large workforce
Low production costs
Large consumer market
Impacts Ageing population means china faces economic slowdown in the future and is unlikely to develop into a global superpower

Impacts of Economic Growth
China does not have all the natural resources it needs to continue economic growth.
China is making trade links with countries in Africa to source raw materials.
Regional differences between rural and urban settlements are emerging. This has increased migration and urbanisation in China.

# Oceans on the Edge Knowledge Organiser

Keywords

Ocean: Vast body of water

Ocean Current: Continuous movement of water generated by a number of forces including wind, waves and temperature.

Biome: A community of living and non living things, relying on each other for survival

Mangroves: A tree which grows in saline water close to shore

Kelp Forest: Kelp are large brown algae that live in underwater forests close to the shore

Coral Reef: Colonies of coral polyps held together by calcium carbonate

Thermal Expansion: Climate change causes ocean temperatures to rise, water expands with heat and sea levels rise.

Ocean Acidification: Decrease in ocean PH levels due to an increase in carbon absorption.

Eutrophication: Increased presence of algae reduces oxygen levels in water.

Tide: Movement of a body of water due to gravitational forces.

Indigenous:people native to a region or country

Carbon Sink: area which absorbs carbon

Coral Bleaching: When coral is damaged it becomes white in colour.

Gigatons: A measure of ice

List the human uses of the oceans:

Annotate the photograph below of the Kelp Forest to identify characteristics of the ecosystem:

Complete the mind map with the causes and impacts of overfishing

Overfishing
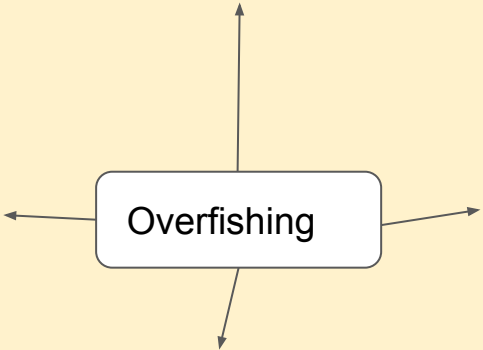
Climate change

Oceans help to reduce climate change by absorbing heat and acting as a carbon sink.

Impacts: Marine ecosystems such as coral become bleached.
Rising temperatures cause ice caps to melt. The Larsen ice shelf broke away from Antarctica, in the Weddell Sea. This equates to 20 Gigatons of ice melting into the sea each year, which is a 4.4mm rise in sea level over a decade.

1: Knowledge Organisers

These provide the basic knowledge for each topic which needs to be known off by heart. This may include, key words, key concepts, costs and benefits.

2: Meanwhile, elsewhere

What we learn in our lessons only offers a glimpse of the world. To widen our understanding, one page research sheets will be used to explore what else was going on around the world at the same time as the topic we are studying. These need to be researched using the links and resources provided and completed.

3: Revision

Preparing for Geography assessments is an essential part of each topic, as these assessments allow teachers and pupils the chance to check their progress in Geography. Revising gives you the chance to show off what you know.

Read
All about oceans
https://www.softschools.com/language_arts/reading_comprehension/science/494/all_about_oceans/

Watch
Oceans 101
https://www.nationalgeographic.com/environment/habitats/ocean/

Deep sea creatures
https://www.youtube.com/watch?v=bPeOe2wBYbs

A Drowning Paradise
https://www.youtube.com/watch?v=TZ0j6kr4ZJ0

Listen
Is it time to ban the plastic bottle?
https://www.bbc.co.uk/programmes/p058jgyr

The future of corals
https://www.bbc.co.uk/programmes/b04wtzz3

Year 9 Topic 2: China. How is China changing the world? How is the world changing China?

Keywords

Air Pollution: is the name for extremely small particles and gases in the **air** which can cause harm if you breathe them in

Consumers people who buy and use products

Contrasts varied physical environments and cultural differences

Export A good that is sold to another country

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<u>Homework</u>

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Read:

China allows three child policy

https://www.bbc.com/news/world-asia-china-57303592

Watch:

BBC The Travel Show - China.
https://www.youtube.com/watch?v=8XNA8UjcN4I

Listen:

Who Dares wins?
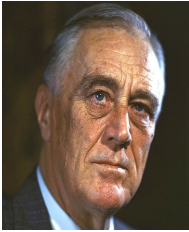https://www.bbc.co.uk/sounds/play/m0009ryt

History

Inter War, Race, identity and persecution, 1918-1939

1. Palestine (UK)
2. Transjordan (UK)
3. Kuwait (UK)
4. Gibraltar (UK)
5. Switzerland
6. Suez Canal (UK)
7. Luxembourg
8. Denmark
9. Bahrain (UK)
10. Qatar (UK)
11. Mauritania (France)
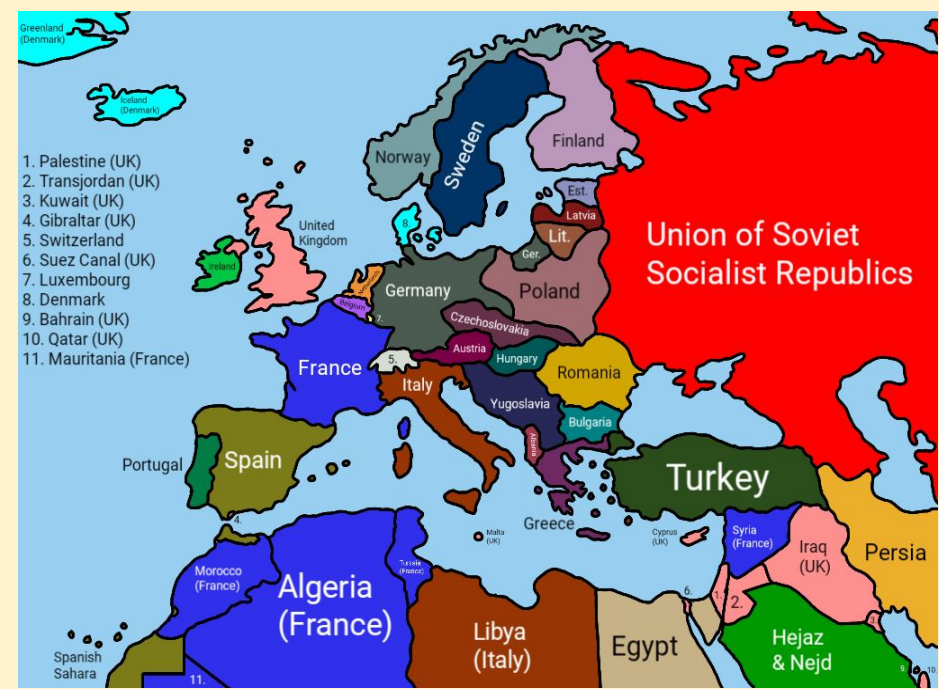
Key Vocabulary

Bolshevik	a member of a political party that believed in violent revolution and followed the ideas of Karl Marx
Great Depression	The period of high unemployment in the 1930s when many businesses failed
nationalist	a person or group within a country that desires political independence
propaganda	material produced by governments and politicians to get people to believe in certain things and influence opinions
tsar	the male rule or emperor of Russia up to 1917
genocide	acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group
ghetto	an area of a town or city in certain parts of Europe in which Jews were interned by the Nazis during the Second World War
Holocaust	the murder of approximately 6 million Jewish men, women and children by Nazi Germany and its collaborators during WWII

Key People

Vladimir Lenin Leader of the Bolsheviks.

Franklin D. Roosevelt President of the USA, 1933-45

Adolf Hitler Chancellor of Germany, 1933-45, and Führer, 1934-45

Oswald Mosley

Leader of the British Union of Fascists

Sophie Scholl

Peaceful resistor to Nazis in Germany.

Timeline of Key Events

Date	Event
Feb 1917	**February Revolution:** Russian Tsar Nicholas II is forced to abdicate and is replaced by a Provisional Government.
Oct 1917	The Bolshevik Party seizes power in Russia in the October Revolution and starts creating the first communist state.
Nov 1918	Kaiser Wilhelm abdicates, and the government that replaces him signs the Armistice on 11 November.
Jun 1919	The Treaty of Versailles is signed, officially blaming Germany for WWI.
May 1926	1.7 million British workers refuse to work during the General Strike.
Oct 1929	The Wall Street Crash in America starts a world-wide Great Depression which lasts into the 1930s.
Jan 1933	Adolf Hitler becomes Chancellor of Germany and begins to introduce a new Nazi regime.
1935	Jewish people are not allowed to marry non-Jewish people
	Jewish people lose the rights of German citizens
1936	Germany Remilitarized the Rhineland in Germany
1938	Jewish communities across Germany and Austria were attacked in an event known as the November Pogrom (Kristallnacht).
Sep 1939	The Second World War begins after Germany refuses to withdraw from an invasion of Poland.
1941	Jewish people over 6 years of age must wear a yellow star
Jan 1942	Nazi officials met at the Wannsee Conference to plan the process of murdering Europe's Jews. Later in the same year, Auschwitz-Birkenau began to receive transports of Jews from western Europe.
1943	Sophie and Hans Scholl are executed following their peaceful protest in distribution Anti Nazi leaflets in the university of Munich
1948	The UN adopted the Genocide Convention. This advised all participating countries to act to prevent and punish actions of genocide.

Year 9 History Homeworks

1: Knowledge Organisers
These provide the basic knowledge for each topic which needs to be known off by heart. This may include a timeline, key words, key concepts and summaries.

2: Meanwhile, elsewhere
What we learn in our lessons only offers a small glimpse of the past. To widen our understanding, one page research sheets will be used to explore what else was going on around the world at the same time as the topic we are studying. These need to be researched using the links and resources provided and completed.

Year 9 Spring Topics Include:

- The British Union of Fascists in the 1930s

3: Revision
Preparing for history assessments is an essential part of each topic, as these assessments allow teachers and pupils the chance to check their progress in History. Revising gives you the chance to show off what you know.

Computer Science

Knowledge Organiser - Networks

Key Terms	Definition
Network	2 or more computers connected together.
Ethernet	A cable that can be used to connect each computer to a network.
Hardware	Physical components of the computer e.g Keyboard and Mouse
Topology	The arrangement of all the devices in a network.
Internet	Worldwide collection of networks.
URL	Addresses to access web servers. E.g. https://www.google.co.uk
WWW	World Wide Web – collection of websites that are hosted on web servers.
IP address	Unique number given to a device on a network. E.g. 192.168.12.345. Used when sending data across a network.
Client	Part of a client-server network that mostly sends requests and receives information.
Server	A network computer used to host websites, applications and files.

Network Topologies

Bus Topology
Pros: Cheap, easy to setup
Cons: Not secure, if bus goes down they all go down.

Ring Topology
Pros: Fast, no data collisions.
Cons: Not secure, if one goes down they all go down.

Star Topology
Pros: Secure, reliable.
Cons: Expensive, needs extra network hardware (hub, switch).

Mesh Topology
Many variations. More complex to set up, but can be far more secure or useful.

Different types of cyber crime

Hacking | Information theft | E-mail bombing | Phishing | Request ransom | System blocking

Common Network Abbreviations:

LAN	Local Area Network, e.g. School
WAN	Wide Area Network, e.g. internet
PAN	Personal Area Network, e.g. Bluetooth.
DNS	Domain Name System, used for internet access.
IP	Internet Protocol, unique network address.
VPN	Virtual Private Network, helps protect networks.
DNS	Domain Name System, used for internet access.
DDos	Distributed Denial of Service attack, crashes servers.

The process

The internet is a global network of computers, some of which are called **web servers**. A web server is a computer which holds websites for other computers linked to the internet to access.
Holding a website is known as 'hosting'. A web server may host one or many websites and webpages. Sending information to a web server is known as **uploading**. Receiving information from a web server is known as **downloading**.
A web server needs to be able to communicate with many different computers at the same time. When information is uploaded to, or downloaded from, a web server it is broken up into tiny pieces called **data packets**. Each packet is a very short communication between the **client** computer and the web server.

Helpful websites:

BBC Bitesize

https://www.bbc.co.uk/bitesize/guides/zc6rcdm/revision/1

DoddleLearn

https://www.doddlelearn.co.uk/app/login

Knowledge Organiser - Programming

Key Terms	Definition
Data Type	Format for storing data in the computer's memory.
Casting	Converting data from one type to another e.g. string to integer
Variable	A named value, stored in memory, that can be changed as the program is running.
Constant	A named value, stored in memory, that cannot be altered as the program is running.
Condition	A statement which can be tested to see if true or false.
Iteration	Repetition of a set of instructions.
For Loop	Definite iteration (set number of times) of a set of instructions
While loop	Indefinite iteration (can run for any number of times based on a condition) of a set of instructions
Selection	A decision made with a program Uses IF....Else.... statements.
Boolean	Logical operator which results in either True or False
Operator	Logic symbol used to create conditions e.g. +, -, =, <, >, /, *

Program structures

Sequence

```
print('\nHello, I am step one.\n')
print('Hello, I am step two.\n')


num1 = 6
num2 = 7


print('I am step five and num1 = {}.\n'.format(num1))
print('I am step six and num2 = {}.\n'.format(num2))

print('I am step seven and here to say goodbye.\n')
```

Selection

```
litter = int(input("How many puppies were born?"))

if litter <= 5:
    print("good size")
elif litter == 6:
    print("just right")
elif litter == 7:
    print("large litter")
else:
    print("goodness me")
```

Iteration

```
name=input("Enter your name: ")
count = 0
name = name.lower()
for x in name:
    if x == "a" or x == "e" or x == "i" or x == "o" or x == "u":
        count = count + 1
print("Vowels =", count)
----------------------------------------
num=int(input("Enter a number between 10 and 20: "))
while num <10 or num >20:
    if num <10:
        print("Too low")
    else:
        print("Too high")
    num=int(input("Try again: "))
print("Thank you")
```

Algorithms

Flowchart

Pseudocode

```
IF spaceship sprite touches asteroid sprite THEN
    show explosion sprite
    play explosion sound
    subtract a life
END IF


IF lives = 0 THEN
    stop game
    show game over screen
ELSE
    restart game
ENDIF
```

Helpful websites:

BBC Bitesize - Writing error free code

https://www.bbc.co.uk/bitesize/guides/zcjfyrd/revision/1

DoddleLearn

https://www.doddlelearn.co.uk/app/login

Maths

Numbers - [click here](#)

Using percentages - [click here](#)

Maths and money - [click here](#)

Deduction - [click here](#)

Rotations and translation - [click here](#)

Pythagoras theorem - [click here](#)

French

Year 9 French Knowledge Organiser – Ma planète

Unité 1 (pages 82–83) *Est-ce que tu manges de la viande?*

French	English
Est-ce que tu manges de la viande?	Do you eat meat?
Je mange …	I eat …
de la viande.	meat.
du poisson.	fish.
des céréales.	cereals / grains.
des fruits de mer.	seafood.
des produits laitiers.	milk products.
des produits d'origine animale.	animal products.
Je ne porte jamais ...	I never wear …
de vêtements en cuir.	leather clothes.
Je ne refuse rien!	I refuse nothing!
Je suis pour le végétarisme.	I am in favour of vegetarianism.
Je suis contre le véganisme.	I am against veganism.
L'empreinte carbone de la viande est très grande.	The carbon footprint of meat is very big.
Il faut protéger l'environnement.	We must protect the environment.
Le régime végétarien est plus sain que le régime ordinaire.	A vegetarian diet is healthier than an ordinary diet.
On doit respecter les animaux.	We must respect animals.
Il est difficile de faire des repas variés quand on ne mange pas de viande.	It's difficult to make varied meals when you don't eat meat.
La viande, c'est très savoureux.	Meat is very tasty.
La viande apporte beaucoup de vitamines importantes.	Meat provides lots of important vitamins.

Stratégie

When you are learning new vocabulary, grouping words together in word families can help you remember them. E.g.:

utiliser (to use)
réutiliser (to reuse)
réutilisable (reusable)

le plastique (plastic)
en plastique (**made of** plastic)
*une campagne **anti-plastique*** (an **anti-plastic** campaign)
*le plastique **à usage unique*** (**single-use** plastic)

Unité 2 (pages 84–85) *Action pour la nature!*

French	English
Qu'est-ce qu'il faut faire pour protéger les animaux?	What must we do to protect animals?
Il faut …	We must…
ramasser les déchets.	pick up litter.
recycler.	recycle.
manger moins de viande.	eat less meat.
utiliser moins de plastique.	use less plastic.
consommer moins d'énergie.	consume less energy.
aller … à pied ou à vélo.	go … by foot or by bike.
Il ne faut jamais …	We must never…
acheter des souvenirs d'origine animale.	buy souvenirs made from animal products.
consommer des espèces de poisson menacées.	eat endangered fish species.
laisser des sacs en plastique sur la plage.	leave plastic bags on the beach.

Year 9 French Knowledge Organiser – Ma planète

Unité 3 (pages 86–87) *Mission anti-plastique!*

French	English
Il/Elle est né(e) … dans une usine.	He/She was born … in a factory.
Il/Elle a voyagé … en camion.	He/She travelled … by lorry.
Il/Elle est rentré(e) à la maison.	He/She went home.
Il/Elle est allé(e) … au collège	He/She went … to school.
Il/Elle est entré(e) … dans le bac de recyclage.	He/She entered … the recyling bin.
Il/Elle a retrouvé … ses ancien(ne)s ami(e)s.	He/She met up with … his/her old friends.
Il/Elle est devenu(e) … un ballon de foot.	He/She became … a football.
Qu'est-ce que tu fais pour réduire le plastique?	What do you do to reduce plastic?

French	English
recycler le plastique	to recycle plastic
refuser les sacs en plastique	to refuse plastic bags
organiser des campagnes anti-plastique	to organise anti-plastic campaigns
acheter des produits recyclés	to buy recycled products
utiliser une bouteille réutilisable / un sac réutilisable	to use a reusable bottle / reusable bag
La semaine dernière, j'ai organisé …	Last week, I organised …
Quand j'étais plus jeune, j'utilisais …	When I was younger, I used to use …
À l'école primaire, je ne faisais rien.	At primary school, I didn't do anything / did nothing.

Unité 4 (pages 88–89) *J'aimerais changer le monde …*

French	English
Qu'est-ce que tu voudrais faire pour changer le monde?	What would you like to do to change the world?
Je voudrais / J'aimerais…	I would like …
acheter moins de vêtements.	to buy fewer clothes.
manger moins de viande.	to eat less meat.

French	English
consommer plus de produits bio.	to consume more organic products.
refuser le plastique à usage unique.	to refuse single-use plastic.
faire du travail bénévole.	to do voluntary work.
devenir membre d'un groupe écologique.	to become a member of a green group.

les problèmes mondials

l'environnement – the environment

l'état de la planète – the state of the planet

le racisme – racism

la cruauté envers les animaux – cruelty to animals

la faim – hunger

la guerre – war

l'injustice – injustice

les drogues – drugs

la pauvreté – poverty

la violence – violence

le changement climatique – climate change

la sécheresse – drought

les inondations - floods

la disparition des espèces – the extinction of species

la destruction des forêts tropicales – the destruction of the rainforests

Year 9 French Knowledge Organiser – Key words and phrases

Les mots essentiels
avec – with
pour – for
donc, alors – so, therefore
car/parce que – because
malheureusement – unfortunately
parfois/quelquefois – sometimes
quelque(s) - some/a few
beaucoup de – lots of
en ce moment – at the moment
en été - in summer
en hiver – in winter
avant-hier – the day before yesterday
il y a (trois) jours - (three) days ago
je suis désolé(e) - I'm sorry
bien sûr - of course
ce/cet/cette/ces - this/these

Les verbes essentiels
faire – to do
aller – to go
voyager – to travel
étudier – to study
être – to be
avoir – to have

Les opinions
Je trouve ça … - I find that …
cool - cool
génial - great
passionnant – exciting
divertissant - entertaining
super - super
ennuyeux/barbant- boring
stupide – stupid
affreux – awful
amusant – fun
intéressant – interesting
incroyable - unbelievable

Les questions
Quel/quelle/quels/quelles …? - which …?
Qui ….? – who …..?
Que ….? – what ….?
Quand …? – when …?
Où …..? – where …?
Pourquoi …..? – why …?
Combien …? – how much/many …?

Les expressions de fréquence
tous les jours – every day
tous les soirs – every evening
tous les samedis – every Saturday
une fois par semaine – once a week
deux fois par semaine – twice a week
souvent – often
de temps en temps – from time to time
rarement – rarely
normalement – normally
d'habitude – usually
aujourd'hui – today
demain – tomorrow
après-demain – the day after tomorrow
ce matin – this morning
cet après-midi
ce soir – this evening
hier - yesterday

Read, listen, watch: Youtube videos, French radio stations, Duolingo (free app), borrow books from the MFL library, watch programmes/films on Netflix/Prime etc with French subtitles/French audio and English subtitles.
Homework: Homework tasks will consolidate speaking, listening, reading and writing tasks in class and will also include activities on Languagenut.

Spanish

Los empleos (jobs)

yo trabajo como (I work as)

mi padre/ padrastro **trabaja como** (my dad/ step dad works as)

mi madre/ madrastra **trabaja como** (my mum/ step mum works as)

yo soy (I am)

el es (he is)

ella es (she is)

actor/ actriz (actor/actress)
amo/a de casa (house husband/wife)
abogado/a (lawyer)
azafata (air steward/ess)
camarero/a (waiter/waitress)
cocinero/a (cook)
contable (accountant)
dependiente (shop assistant)
enfermero/a (nurse)
granjero/a (farmer)
hombre de negocios (businessman)
mujer de negocios (businesswoman)
ingeniero/a (engineer)
mecánico/a (mechanic)
médico/a (doctor)
peluquero/a (hairdresser)
periodista (journalist)
profesor/a (teacher)

Where do they work- ¿dónde trabajan?

trabajo en (I work in)

trabaja en (he/she works in)

trabajas en (you work in)

trabajan en (they work in)

un teatro (a theatre)
casa (home)
una oficina (an office)
un avión (a plane)
un restaurante (a restaurant)
un café (a coffee shop)
una tienda (a shop)
un hospital (a hospital)
una granja (a farm)
un garaje (a garage)
una peluquería (a hair salon)
un colegio (a high school school)
una escuela (a school)
una guarderia (a nursery)

¿Cómo ayudas en casa? How do you help at home?

los sábados- on Saturdays

el fin de semana- at the weekend

después del colegio-after school

hago de canguro= I baby sit

arreglo mi habitción= I tidy my room

reparto periódicos= I deliver newspapers

cocino= I cook

lavo platos= I wash dishes

pongo la mesa= I lay the table

quito la mesa= I clear the table

plancho la ropa= I iron the clothes

paso la aspiradora= I hoover

rego las plantas= I water the plants

cuido de mis hermanos= I look after my brothers/sisters

Music

Knowledge Organiser - Music Spring Term

Spring Term 1 - Developing Harmony

- Extended Harmony are chords with extra notes beyond the basic triad.
- By developing the harmony beyond the root position triad, composers can create more harmonic interest in their work

This is the F# Major triad, made up of: Root +3rd +5th

F#   A#   C#   F#maj
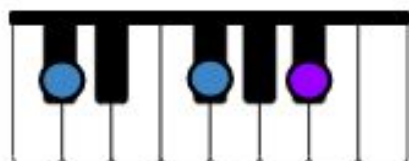
In the last chord of *Alexander Hamilton* opening chord progression, Lin Manuel Miranda inverts the triad by moving the root note (F#) to the top of the triad, making the note C# the lowest note.

| Bm | F# | G | D | F#/A# |

Keywords - Spring Term 1

Chord	A group of three or more notes played at the same time
Chord progression	A series of chords played in sequence
Root note	The lowest note in a chord. The root is also the 'name' of the chord. E.g. the root of an A Major chord is A.
Inversion	Rearranging the order of the notes in a chord
Bassline	The lower supporting notes in piece of music
Voicing	The arranging of notes in a chord structure

Keywords - Spring Term 2

Clave	A rhythmical pattern originating from Cuba that most Latin American music is based on.
Syncopation	Off beat rhythms.
Polyrhythm	More than one rhythm played together.
Extended Harmony	Jazz inspired chords with extra notes on a triad. These are named 7th, 9th, 11th, 13th etc.

Spring Term Two - Salsa

Salsa is a vibrant style of Latin American music with its roots in Cuba and America. It is created for dance and the word Salsa is often used to refer to a range of dances with roots all over the Caribbean, including the Salsa, Mambo, Merengue and Cha Cha Cha.

The music uses a range of latin percussion with rhythms influenced by African patterns, fused with pitched instruments like Brass and Saxophones often found in Jazz

Musical Features and Background

Instruments

Timbales - like a snare drum and paired with cowbells.

Claves - play a clave rhythm. A simple pair of wooden sticks.

Tito Puente
Ernesto Antonio Puente, Jr., (born April 20, 1923, New York, New York, U.S.—died May 31, 2000, New York City), American bandleader, composer, and musician who was one of the leading figures in Latin jazz. His bravura showmanship and string of mambo dance hits in the 1950s earned him the nickname "King of Mambo."

Clave Pattern - This is the key or heartbeat to Salsa music. It gives the music its unique rhythm or feel. There are variations on a the clave. The most common two are below.

3-2 son clave in two measures of 2/2

2-3 son clave in two measures of 2/2

Knowledge Organiser - Music Spring Term

Homework

- Come to the Music Department for Year 9 Homework Clubs to practice for your performances

- Complete knowledge and key word checks on Google Classroom

- Complete performance reflection at the end of the topic

General Listening/Watching/Reading

Listen & Watch

Lin Manuel Miranda - *96,000* from *In The Heights*

https://youtu.be/J1THRAluOGI

Lucy Moss & Toby Marlow - *Six* from SIX

https://youtu.be/WJbaU4j0JCo

Tito Puente 'Ran Kan Kan
https://www.youtube.com/watch?v=9LDea8s4yZE

Camilla Cabello - 'Havana'
https://youtu.be/HCjNJDNzw8Y

Religious Studies

Coming soon

Science

Science knowledge organiser here