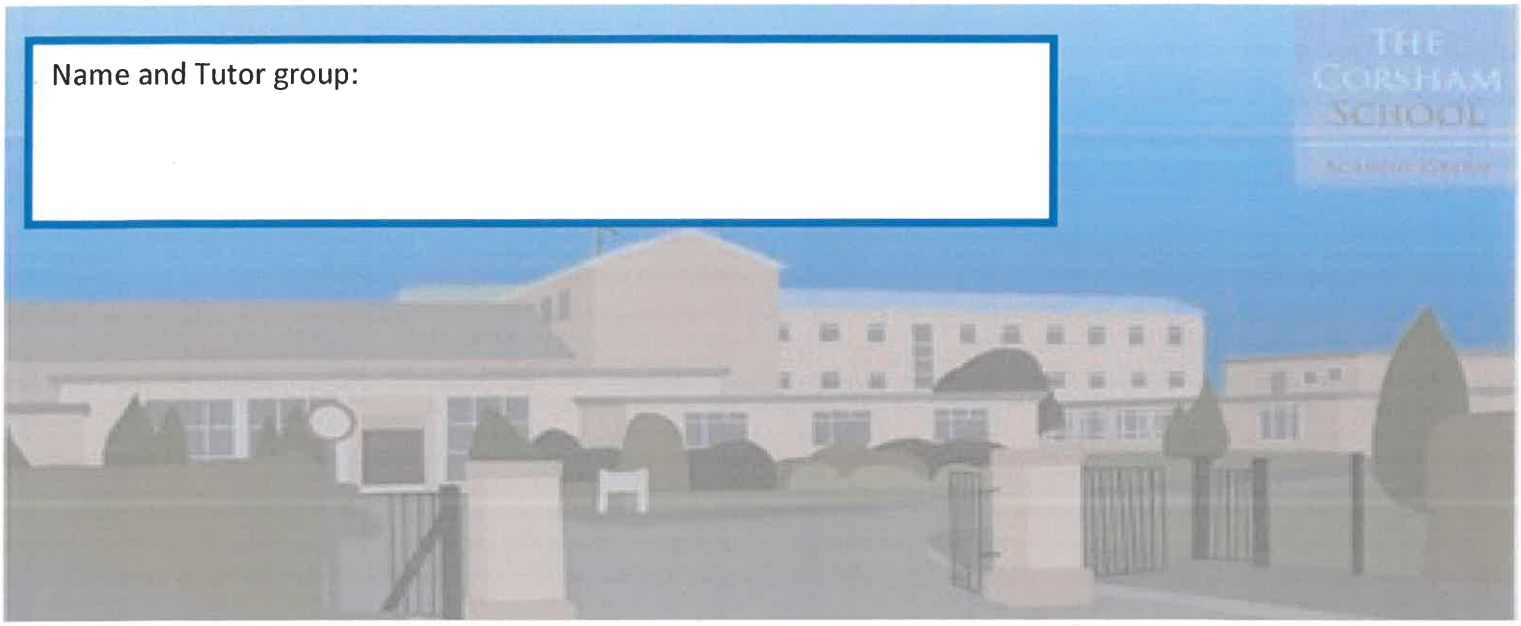
Name and Tutor group:



Year 7 Knowledge Organiser

Term 5

Contents

Page 1	Art
Page 2	Computing
Page 3	Drama
Page 4	DT (Food)
Page 5	DT (CAD and CAM)
Page 6	DT (Graphics)
Page 7	DT (RM)
Page 8	DT (Textiles)
Page 9	English
Page 10-11	French
Page 12-13	Geography
Page 14-16	History
Page 17-18	Maths
Page 19	Music
Page 20-21	PC
Page 22-24	Science

CORSHAM CHARACTER

INTELLECTUAL VALUES

The pursuit of truth, knowledge and understanding.

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

PERFORMANCE VALUES

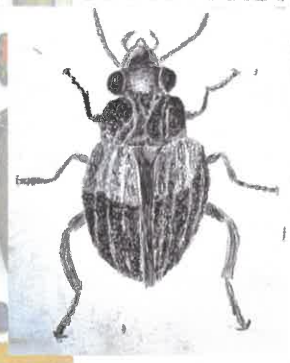
Maximum effort, maximum focus.

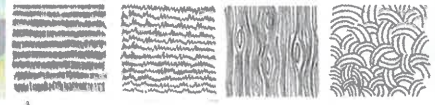
Be resilient. Always Persevere. Contribute to Teamwork. Be ambitious.

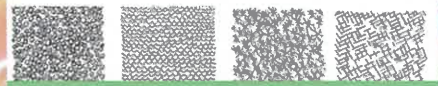
DREAM BELIEVE ACHIEVE

Knowledge Organiser – Year 7 Art

INSECTS







EXAMPLES OF OUTCOMES:

YOU WILL LEARN:

In this project, you will explore the theme of insects.

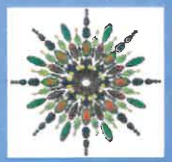
You will create a **series of work** using different techniques and media and then create an outcome inspired by artists.

Why am I learning this?

The foundation skills in this project will enable you to tackle the varied concepts, artists, techniques and processes throughout Year 7.
You will build on your knowledge and skills with each project as they increase in difficulty, enabling you to express yourself in a confident way.

CONTEXTUAL KNOWLEDGE:

Christopher Marley



Lucy Arnold

Impressionism was about artists painting outdoors and spontaneously usually of landscapes and of everyday life. The focus was on light and colour using rapid and broken brushstrokes to represent this.

Post-Impressionism was a few artists who extended and changed impressionism from 1886. **Vincent van Gogh** was one of these artists.

Mark making is a term used to describe the different lines, patterns, and textures we create in an artwork.

Homework Tasks:

Tick when complete ✓

1. Patterned Insect
2. Lucy Arnold inspired collage.
3. Steampunk Insect
4. Insect in a box

HOW WELL AM I DOING?

Year 7 Progress – Insects Project – Term 5&6		
Name:		
	TARGETS: Not Yet Met, Met, Exceeded (NM/M/E)	Please mark with tick / ✓ in the column
TASK ONE: Pencil tonal study of an insect	You have drawn the features and shape of your insect accurately with correct proportion.	
	You have developed areas of tantural shading to show the knowledgeable or smooth body and you have shown accurate detail.	
	You have shown a variety of dark to light shading to suggest form and show accurate proportions.	
TASK TWO: Mark-making techniques and insect drawing with pen	You have carefully completed a mark-making grid showing a different variety of techniques.	
	You have accurate drawn out an insect of your choice.	
	You have shown a variety of mark-making techniques on your insect to create a realistic insect, building up tone.	
TASK THREE: Lucy Arnold pencil and oil pastel section	You have carefully selected a section of Lucy Arnold's work using a viewfinder and drawn in out correctly.	
	You have shown accurate colouring in with pencil colours, layering and blending well.	
	You have shown accurate colouring in with oil pastels, layering and blending well.	
TASK FOUR: Create a clay insect tile	You have design two interesting and different clay tiles. You have explained how you will create each part of your insect on your tile.	
	You have successfully created a detailed and unique insect clay tile. Your tile has a mixture of techniques and techniques.	
	You have neatly painted your clay tile and chosen appropriate colours for your insects.	
	End of project Overall Target:	
Teacher Comments:		

Keywords

Insects	Any group of small animals having no backbone and three parts to their body.
Tone	The lightness or darkness of something – this could be shade, or how dark or light a colour appears.
Clay Relief	A sculptural method in which the sculpted pieces remain attached to a solid background.
Mark-making	Different lines, patterns and textures.
Collage	A piece of art made by sticking different materials together such as photographs and pieces of paper or fabric
Form	Forms are 3 dimensional shapes. They occupy space, like people!

Information about Christopher Marley:
https://www.youtube.com/watch?v=V5b03Nb6ORs

Knowledge Organiser -Micro:Bits

Key vocab	
Micro:bit	A small computer designed by the BBC for use in computer education in the UK.
Processor	Receives inputs from the computer and produces outputs.
USB	The form of power supply used by the Micro:bit - power is transmitted from the computer via a micro-USB cable.
Buttons	Input devices used within the Micro:bit to control or alter programs whilst running.
LED (Light emitting diodes)	(LEDs) - used on the Micro:bit as a screen in a 5x5 grid to display information.
Accelerometer	An input device within the Micro:bit to control or alter programs by tilting or moving the device.
Microsoft Block Editor	The visual programming language used to create
Algorithm	A set of instructions to be followed to complete a given task or solve a problem.
Program	A sequence of instructions used by a computer.
Sequence	The order which the computer will run code in, one line at a time.
Selection	A decision made by a computer, choosing what code should be run only when certain conditions are met.
Condition	Checking to see whether a statement or sum is true or false.
Iteration	When a section of code is repeated several times - also known as looping.
Variable	Something which can be changed in a computer. Made up of a name and some data to be saved.

https://makecode.microbit.org/

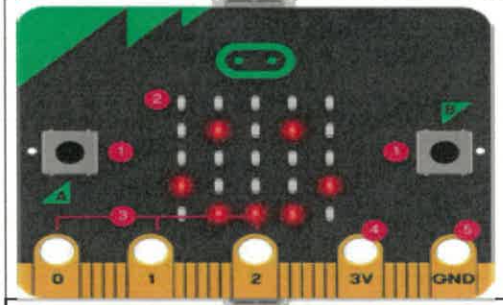
Key features of the micro:bit

On-board motion detector or "accelerometer" that can detect movement and tell other devices you're on the go. Featured actions include shake, tilt and freefall.

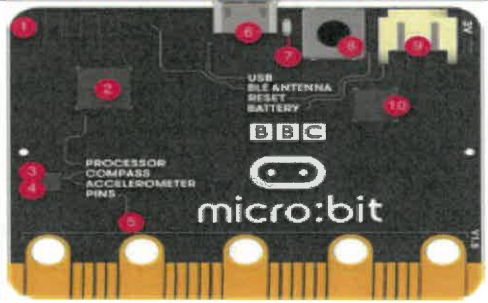
A built-in compass or "magnetometer" to sense which direction you're facing, your movement in degrees, and where you are.

Bluetooth Smart Technology to connect to the internet and interact with the world around you.

Five Input and Output (I/O) rings to connect the micro:bit to devices or sensors using crocodile clips or 4mm banana plugs.



1. Buttons
2. LED display & light sensor
3. Pins - GPIO
4. Pin - 3 volt power
5. Pin - Ground



1. Radio & Bluetooth antenna
2. Processor & temperature sensor
3. Compass
4. Accelerometer
5. Pins
6. Micro USB socket
7. Single LED
8. Reset button
9. Battery socket
10. USB interface chip

Year 7 Term 5 Physical Theatre Knowledge Organiser

Skills and Techniques:

- **Actions** (eg travel, turn, elevation, gesture, stillness, use of different body parts, floor work, transfer of weight)
- **Dynamics** (eg fast/slow, sudden/sustained, strong/light, flowing/abrupt)
- **Space** (eg pathways, levels, directions, size of movement, patterns, spatial design)
- **Relationships** - eg lead and follow, mirroring, action and reaction,, complement and contrast, formations)
- **Timing**
- **Rhythm**

Choreographic devices

- Motif and development
- Repetition
- Contrast
- Highlights
- Climax
- Changes in numbers of dancers
- Unison and canon.

Positions and groupings:

Solo
Duet
Trio
Group

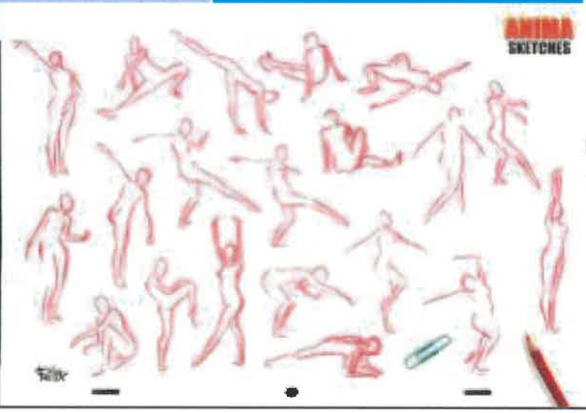
Centre stage
Upstage
Downstage
Stage Left
Stage Right
Onstage
Offstage

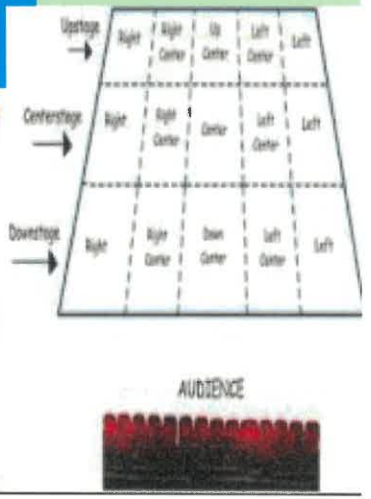
Performance skills

- Posture
- Alignment
- Balance
- Coordination
- Control
- Flexibility
- Mobility
- Strength
- Stamina
- Extension

Key Words:

Choreography
Pathways
Direction
Level
Speed
Extension
Timing
Phrase
Stimulus





Year 7 Food - Knowledge Organiser

Key Skills

Breadmaking

Kneading – This works the dough to develop the **gluten** in the flour.

Gluten – The protein in flour that gives baked goods their structure and texture.
When making the dough the dry ingredients are combined with the wet ingredients. Warm water is added to activate the **yeast** which is a natural raising agent.

Fermentation - Yeast feeds on the sugar contained with the dough, producing carbon dioxide and alcohol, in a process called fermentation. During bread making, the dough is left in a warm place. The warmth causes fermentation to take place

Function of ingredients in bread – Strong plain flour, water, salt, yeast, sugar, oil.

Health and Safety Rules in our Kitchen

- Wash hands thoroughly with soap and hot water
- Tie hair back
- Put on a clean apron
- Blazer and jumper off and roll up sleeves
- Bags under the table and chairs pushed under
- Sensible behaviour
- Listen to instructions
- No running in the kitchen
- Do not cough or sneeze onto food
- Use the correct colour chopping board
- Clear up spills immediately
- Do not mix raw and cooked food on the same board
- Follow the washing up routine

Food Hygiene

- **Food Poisoning:** Illness caused from eating contaminated food.
- **Bacteria:** Microscopic living organisms – some are good and some are bad!
- **High risk foods:** Foods that are high in protein and high in moisture. These foods need to be cooked and stored correctly to avoid harm

Personal Skills

- Confidence
- Organisation
- Teamwork
- Time management

Knife Skills

Bridge Hold

Claw Hold

Vegetable cuts

Conduction

Energy is transferred by direct contact

Convection

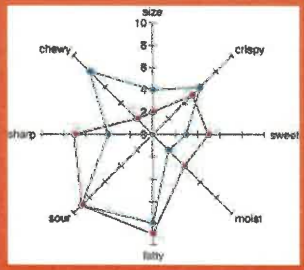
Energy is transferred by the mass motion of molecules

Radiation

Energy is transferred by electromagnetic radiation

Sensory Analysis

Using technical descriptive words to evaluate food products. Using our senses - taste, texture, aroma and appearance. We record this information onto a star (sensory) profile.



We use this to compare the sensory profile of a shop bought and home made product.

Key Practical Skills

- **Chopping and Knife Skills** – fruit salad, layered salad
- **Rubbing in method** – shortbread, scones and quiche
- **Creaming method** – fairy cakes
- **Melting method** – flapjacks
- **Pastry Making and Rolling** – Quiche, tomato tart
- Bread making – Bread Rolls, Focaccia, Chelsea buns.

Washing Up Routine

RINSE

STACK

WASH

DRAIN

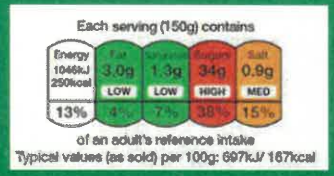
DRY

Keywords

- Hygiene
- Safety
- Fermentation
- Sensory Analysis
- Healthy
- Bacteria
- Evaluate
- Kneading
- Consumer
- Gluten

Healthy eating

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

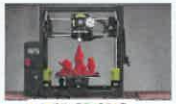


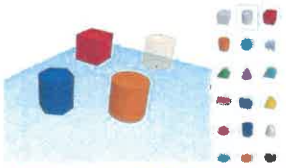
The Traffic light system shows us if a product is high, medium or low in fat, saturated fat, sugar, fibre and energy so we can make an informed choice

KS3 YEAR 7

Tools and Equipment

CAD/CAM

Computer		A machine or a device used to create designs.
Laser cutter		A machine which will cut a variety of materials using a laser.
3D printer		A machine which will print 3D designs.
Filament		The material used to print 3D designs.
2D Design		A 2D CAD software.
Tinkercad		A 3D CAD software.



What is CAD?

CAD stands for Computer Aided Design.
Examples include:

- 2D Design
- On shape
- Google Sketchup

What is CAM?

CAM stands for Computer Aided Manufacture.
Examples include:

- Laser cutter
- 3D Printer
- CNC Router

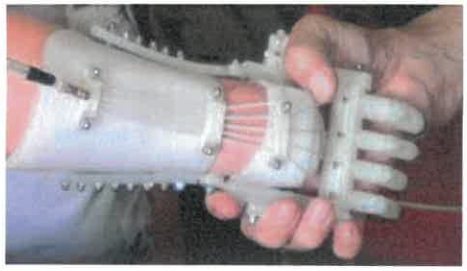
What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Maths in DT:

Multiplication
Divide
Add / Subtract
Measurement conversion
Ratios
Percentages
Surface area

D&T CAD AND CAM



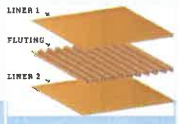
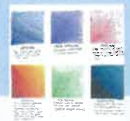
Keywords

Design
Product analysis
Research
Evaluation
2D Design
Layout
Nodes
Colour/Fill
CAD
CAM
Edit
Text
Path
Function
Contour
Bitmap
Keyring
3D Printing
Filament
Laser cutter

Year 7 Graphics

DESIGN AND TECHNOLOGY

Tools, Techniques, Materials and Equipment

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

Paper and Board

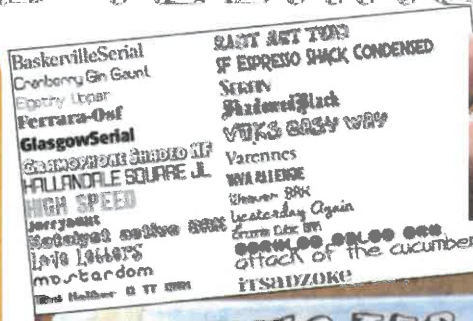
Papers and boards are made from wood pulp and are converted in a paper mill.
Paper is measured in Grams Per Square Metre (GSM).
Board thickness is quoted in microns or Grams Per Square Metre (GSM).

Packaging

To protect products, especially in transport
To promote product using attractive fonts, logos and designs.
To present the product.
To place the product.
To provide important information.

Keywords

Graphics
Communication
Commercial
Innovative
Onomatopoeia
Product
Branding
Logos
Font
Design Fixation
Collaboration
Paper
Packaging
Design Approach
Wrapper
Product information
Template



Maths in DT:

Multiplication
Divide
Add / Subtract
Measurement conversion
Ratios
Percentages
Surface area

What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Health and Safety in DT:

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

KS3 YEAR 7 D&T RESISTANT MATERIALS

Tools and Equipment

Measuring and marking

Steel rule		An accurate tool for measuring and marking out
Try square		A tool used to check right angles on wood or plastic
Template		A template is a tool used to mark out shapes repeatedly

Shaping and finishing

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

Softwood

Softwoods come from coniferous trees which are evergreen, needle-leaved, cone-bearing trees, such as cedar, fir and pine.

Hardwood

Hardwoods come from broadleaved, deciduous trees, such as oak, maple and beech.

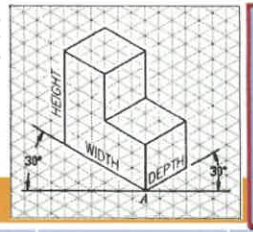
Manufactured board

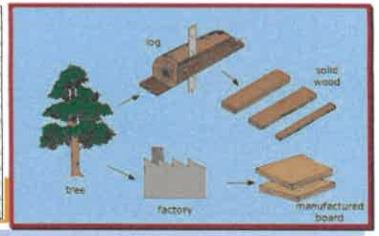
Manufactured boards are timber sheets which are produced by gluing wood layers or wood fibres together. Manufactured boards often made use of waste wood materials. Ply, MDF or chipboard.

Keywords

Bench hook
Bookend
Coping saw
Hardwood
Softwood
Joint
Tenon saw
Reciprocating saw
Vice
Abrasive
Template
Specification
Research
Design
Practical task
Evaluation
Timber cycle

Isometric Drawing
2 point perspective





Cutting

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

We use **ACCESS FM** to help us write a **specification** - a list of requirements for a design - and to help us **analyse and describe** an already existing product.

ACCESS FM - Helpsheet

A is for **Aesthetics**
Aesthetics means what does the product look like? What is the: Colour? Shape? Texture? Pattern? Appearance? Feel? Weight? Style?

C is for **Cost**
Cost means how much does the product cost to buy? How much does it: Cost to buy? Cost to make? How much do the different materials cost? Is it good value?

C is for **Customer**
Customer means who will buy or use your product? Who will buy your product? Who will use your product? What is their: Age? Gender? What are their: Likes? Dislikes? Needs? Preferences?

E is for **Environment**
Environment means will the product affect the environment? Is the product: Recyclable? Renewable? Reusable? Sustainable? Environmentally friendly? Bad for the environment? 6R's of Design: Recycle / Reuse / Repair / Rethink / Reduce / Refuse

S is for **Size**
Size means how big or small is the product? What is the size of the product in millimeters (mm)? Is this the same size as similar products? Is it comfortable to use? Does it fit? Would it be improved if it was bigger or smaller?

S is for **Safety**
Safety means how safe is the product when it is used? Will it be safe for the customer to use? Could they hurt themselves? What's the correct and safest way to use the product? What are the rules?

F is for **Function**
Function means how does the product work? What is the products job and role? What is it needed for? How well does it work? How could it be improved? Why is it used this way?

M is for **Material**
Material means what is the product made out of? What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?

Traditional wood joints:

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

Maths in DT:

Multiplication
Divide
Add / Subtract
Measurement conversion
Ratios
Percentages
Surface area

What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Health and Safety in DT:

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

KS3 YEAR 7

DT TEXTILES

Tools and Equipment

Measuring and marking

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

Constructing

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

Fibres to Fabric

Fibres – short (staple) or long (filament) threads used to make yarn.
Yarn - Yarn is **a length of fibres.** Continuous length of fibres which are interlocked, used to produce fabrics, as well as in crocheting, knitting, embroidery and ropemaking.
Fabric – cloth made up of woven/knitted/bonded fibres/yarn

Fibre Categories:

Natural Fibres

Plant based natural fibres:

- Cotton
- Linen
- Flax
- Coir (coconut)

Animal based natural fibres:

- Wool
- Angora
- Silk

Man-made Fibres

- Polyester
- Acrylic
- Nylon

Fabric Construction:

Woven
Knitted
Bonded

Keywords

Resilience
Design
Product analysis
Research
Evaluation
Stitch
Scissors
Sewing machine
Fibres
Yarn
Fabric
Customer
Environment
Function
Material
Seam allowance
Invisible stitch
Embroidery
Applique
UCD

Cutting

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

Surface Decoration

Applique		Sewing one piece of fabric on top of another piece of fabric
Embroidery		A decorative stitch
Beads		A small decorative object which can be sewing onto fabric
Buttons		A type of fastener

Types of Seams:

Plain
French
Flat felled
Bound
Lapped

Maths in DT:

Multiplication
Divide
Add / Subtract
Measurement conversion
Ratios
Percentages
Surface area

What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Health and Safety in DT:

- Listen to your teacher's instructions
- Always wear an apron
- Long hair should be tied back
- Don't use equipment you are not trained on
- Work quietly and be sensible and careful at all times

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

THE CORSHAM SCHOOL

Y7 ENGLISH – PROSE STUDY

Narrative Voice

A story has to be 'told' to the reader and a 'narrator' is needed to do this. A narrator's voice can be first, second or third person. Here is a quick summary:

- **First person** uses 'I' or 'we' to tell the story. In this case, the narrator is a character and you will read about events from their point of view. You are more likely to be able to relate to and sympathise with their feelings because of this.
- **Second person** uses 'you'. It is not often used in fiction texts and it's rare to find a story written entirely from this perspective (*try writing a piece in the second person to see how difficult it is*). However, some fiction texts, such as gamebooks (choose your own adventure) use this perspective.
- **Third person** uses 'he', 'she', 'it' or 'they'. The narrator of the story will usually be the writer. Some texts will give many different characters' viewpoints, but others will focus on one character, the hero or heroine, and the reader will usually relate to and sympathise with them more than others.

What is explicit and implicit meaning?

Explicit meaning describes something that is very clear and without vagueness or ambiguity.

Implicit meaning often functions as the opposite, referring to something that is understood, but not described clearly or directly, and often using implication or assumption.

Context

The context of a text is the place and time in which it was written, who it was written by, and where it was published. All of these affect the purpose and effect of the text.

Terminology	Definition
Symbolism	Use of symbols to represent ideas or qualities.
Imagery	Visually descriptive language.
Hyperbole	An exaggeration.
Allegory	Extended metaphor in which a symbolic story is told.
Onomatopoeia	A word that imitate the sound it represents.
Personification	A figure of speech in which an object is given human feelings, thoughts or attitudes.
Metaphor	A metaphor is a figure of speech that describes an object or action in a way that isn't literally true.
Simile	A comparison that uses 'like' or 'as'.

Using quotations and useful phrases

When quoting from a text, remember to:

- use quotation marks
- quote accurately
- quotes of three words or fewer can be used in the sentence you are writing - for example, when the writer talks about the 'futility of life' he means...
- short, well-chosen quotations are better than long ones , so that you can give more precise analysis

Remember that certain words and phrases are helpful when you're explaining an idea in some detail, especially if you are commenting on implicit meaning. The following list shows some of those phrases:

- this implies
- this suggests
- which gives the impression that
- possibly
- perhaps
- this indicates that
- this shows
- obviously

Use to **connectives** to build your analysis. Here are some examples:

- however
- therefore
- in contrast
- because
- but
- and
- furthermore
- also
- then
- at first

Point de départ (pages 82–83)

le pays de Galles	*Wales*
le Portugal	*Portugal*
la Belgique	*Belgium*
la France	*France*
la Grèce	*Greece*
la Pologne	*Poland*
la Suisse	*Switzerland*
l'Allemagne	*Germany*
l'Angleterre	*England*
l'Écosse	*Scotland*
l'Espagne	*Spain*
l'Irlande	*Ireland*
l'Irlande du Nord	*Northern Ireland*
l'Italie	*Italy*
As-tu un animal?	*Have you got a pet?*
J'ai …	*I have …*
un chat	*a cat*
un chien	*a dog*
un cochon d'Inde	*a Guinea pig*
un hamster	*a hamster*
un lapin	*a rabbit*
un lézard	*a lizard*
un oiseau	*a bird*
un poisson	*a fish*
un serpent	*a snake*
Je n'ai pas d'animal.	*I don't have a pet.*
vingt	*20*
trente	*30*
quarante	*40*
cinquante	*50*
soixante	*60*
soixante-dix	*70*
quatre-vingts	*80*
quatre-vingt-dix	*90*
cent	*100*

Unité 1 (pages 84–85) *Décris-moi ta famille*

la famille	*family*
la famille d'accueil	*foster family*
le (beau-)père	*(step-)father*
le grand-père	*grandfather*
le (demi-)frère	*(half/step-)brother*
le fils / la fille	*son / daughter*
la (belle-)mère	*step-mother*
la grand-mère	*grandmother*
la (demi-)sœur	*(half/step-)sister*
les parents	*parents*
il/elle est …	*he/she is …*
petit(e)	*small*
grand(e)	*tall*
de taille moyenne	*medium-sized*
il/elle a les yeux ...	*he/she has ... eyes*
bleus / verts / marron	*blue / green / brown*
il/elle a les cheveux …	*he/she has … hair*
noirs / blonds	*black / blond*
roux / gris / bruns	*red / grey / brown*
courts / longs / mi-longs	*short / long / medium-length*
bouclés / raides	*curly / straight*
une barbe	*a beard*
des taches de rousseur	*freckles*
des tatouages	*tattoos*
il/elle porte des lunettes	*he/she wears glasses*

Unité 2 (pages 86–87) *Où habites-tu?*

Où habites-tu?	*Where do you live?*
J'habite …	*I live …*
en Angleterre	*in England*
au pays de Galles	*in Wales*
dans un appartement	*in a flat*
dans une maison	*in a house*
J'aime habiter ici.	*I like living here.*
Je n'aime pas habiter ici.	*I don't like living here.*
C'est ...	*It's ...*

tranquille	*peaceful*
grand	*big*
confortable	*comfortable*
trop petit	*too small*
Il n'y a pas de place.	*There's no space / room.*
le salon	*the living room*
la cuisine	*the kitchen*
la chambre	*the bedroom*
la salle de bains	*the bathroom*
la salle à manger	*the dining room*
le jardin	*the garden*

Unité 3 (pages 88–89) *Qu'est-ce que tu manges au petit déjeuner?*

Qu'est-ce que tu manges au petit déjeuner?	*What do you have for breakfast?*
Je mange …	*I eat …*
un croissant	*a croissant*
un fruit	*a piece of fruit*
du pain (grillé)	*(toasted) bread*
du beurre	*butter*
du bacon	*bacon*
du yaourt	*yoghurt*
une tartine	*a slice of bread with jam or spread*
de la confiture	*jam*
des céréales	*cereal*
des œufs	*eggs*
Je bois …	*I drink …*
du jus de fruits	*fruit juice*
du chocolat chaud	*hot chocolate*
du lait	*milk*
de l'eau	*water*
Je ne mange rien.	*I don't eat anything.*

Unité 4 (pages 90–91) *On fait la fête!*

le 14 juillet	*Bastille Day*
la fête nationale	*national holiday*
un jour de congé	*a day off*

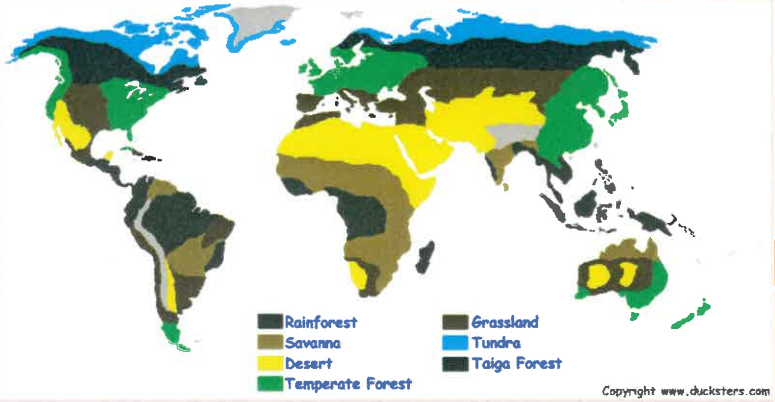
un défilé (militaire)	*a (military) parade*
un bal	*a dance*
regarder un feu d'artifice	*to watch fireworks*
faire un pique-nique	*to have a picnic*
faire la fête	*to celebrate*

Unité 5 (pages 92–93) *Une drôle de famille*

grincheux(-se)	*grumpy*
studieux(-se)	*studious*
marrant(e)	*funny*
sévère	*strict*
maigre	*thin*
furieux(-se)	*angry*
il habite	*he lives*
elle habite	*she lives*
ils habitent	*they live*

What and where are Biomes?

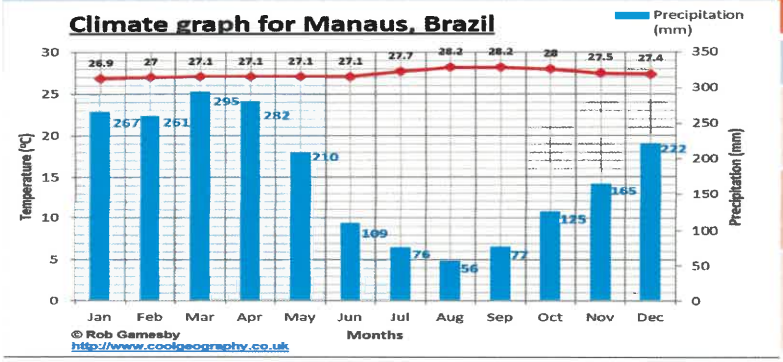
A biome is a very large ecosystem. There are many major biomes shown in the map below. The vegetation (flora) and animals (fauna) in each biome is determined by the climate of that region.



Notice how the biomes are linked to latitude. As the latitude changes away from the equator the biome also changes.

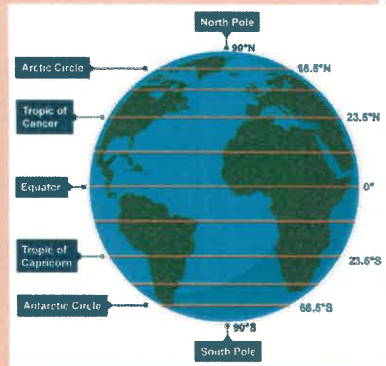
What is a climate graph?

We measure a regions climate on a climate graph. This tells us the temperature and precipitation levels each month. The rainfall is always shown as the bar graph and the temperature as a line graph.

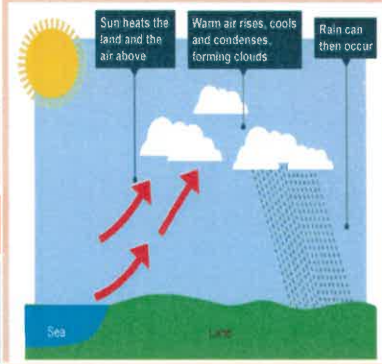


What are lines of latitude

Lines of latitude go around the world. The equator is latitude line 0 and the north pole is latitude line 90N. The tropic of cancer is 23.5N. The higher the latitude line the further away from the equator you are and so the climate will change



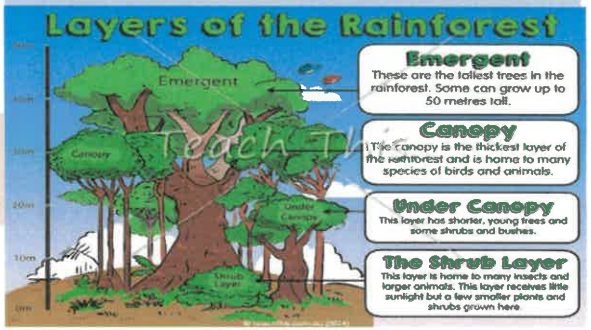
Convectional rainfall in the rainforest



The solar radiation heats up the air.
This air rises as it is now less dense.
As it rises it cools, condenses to form clouds.
Therefore rainforests create at least 50% of it's own rainfall.

Climate and characteristics of a rainforest

- Rainforests are located between the Tropic of Cancer and the Tropic of Capricorn.
- Due to its proximity to the equator it has a high temperature.
- Due to the high temperatures all year round it creates a lot of **convectional rainfall.**
- The rainforest has 4 distinct layers shown in the diagram below.



Year 7 Geography – How important are ecosystems?

Flora and Fauna of the Tundra

The flora and the fauna has adapted in the rainforest to suit the climate.

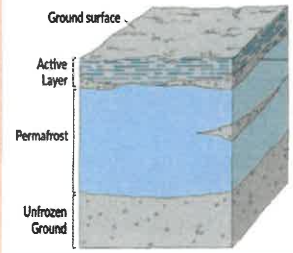
Drip tips	Leaves have evolved to have sharp tips to their leaves, this is that it can shed all the rainfall so it doesn't drown.
Tree trunks and buttress roots	Trunks are branchless to help them compete to grow tall and buttress roots help keep the tall trees grounded.
Sloths	Spend much of their time hanging from the branches of the canopy. They are camouflaged in the forest

Human impact on the rainforest: Deforestation

Causes	Impacts	Management
Deforestation mostly occurs so land can be cleared for farming. The two types of farming are cattle farming for beef and Palm oil used in many foods and cosmetics.	Rainforests are important because they absorb significant amounts of carbon dioxide from the atmosphere. By removing the trees, less carbon dioxide can be absorbed and so more is kept in the atmosphere.	Reducing the demand for beef and palm oil globally will reduce the need for mass deforestation. Protection schemes can also be implemented by local governments but these have to be enforced.

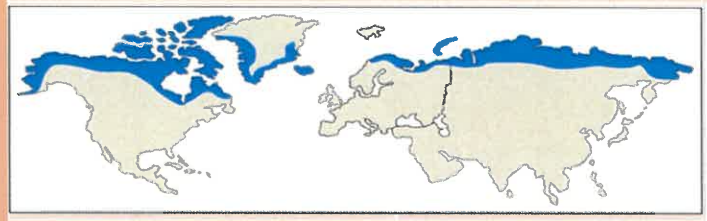
What is permafrost?

Permafrost is permanently frozen soil. (although the top section of the soil thaws in the summer so plants can grow) Most of it has been frozen for thousands of years. It contains a significant amount of carbon in the form of dead plants.



Where is the Tundra?

The tundra is a biome which is found within the Arctic circle (above 66.5N). It is the land area before the sea ice of the Arctic starts.



Flora and Fauna of the Tundra

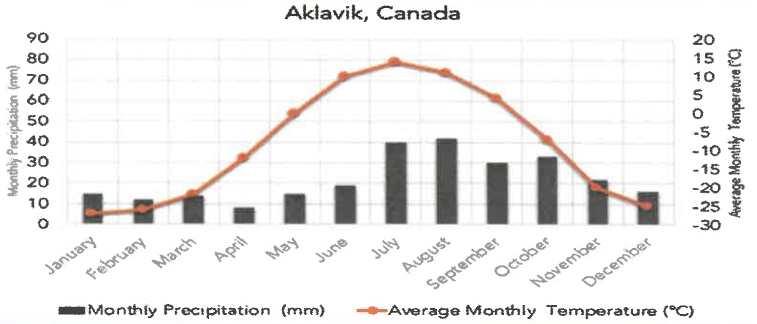
Flora (plants) and Fauna (animals) have adapted to live in the tundra.

Flora	Fauna
There are thousands of species in the tundra, they are small and close to the ground. Plants include short shrubs, flowers and birch trees. They have adapted to surviving in cold conditions.	Polar bear is the main predator in the tundra, it is well camouflaged and hibernates for the winter. Caribou are "deer like" animals that migrate across the tundra.

Year 7 Geography – How important are ecosystems?

Climate and characteristics of the Tundra

Due to its latitude the temperature is below freezing for 8 months of the year. There is plenty of rainfall in the Tundra too with an average 30mm.



For 8 months of the year the tundra is covered in snow and ice and the active layer of the permafrost is frozen. For 4 months of the year the tundra thaws out. This is when the active layer thaws and flowers and other fauna can grow. The plants do not grow very high due to the limited growing time.

Human impact on the tundra: Permafrost

Causes	Impacts	Management
Human caused climate change is a) melting the permafrost. b) Allowing tree species to invade due to warmer climates.	More carbon is released not the atmosphere as carbon is released. This is accelerated the greenhouse effect. Buildings sink into the thawed soil (it was once solid). Much more of the tundra is covered in lakes	Governments are being asked to reduce their carbon emissions to try and control the amount of carbon. However many governments still need to burn fossil fuels to help their economy.

Enquiry: What was the impact of European expansion on the wider world?

History – Year 7
Knowledge Organiser
Topic 4

Outline: During the early Modern period, many European countries began to explore the rest of the world. The places they went to were inhabited by indigenous people but European countries claimed these for their own and set up colonies there. The indigenous people were often treated poorly by the settlers whilst the colonists began to establish colonies which would later lead to empires being created.

Event	Date	Summary
Roanoke settlement	1585-90	Failed colony attempt in Virginia. The colonists made many mistakes and also mistreated the indigenous people. The last colonists disappeared without trace
Jamestown	1607	The first English colony to be successfully set up on North America. It was in Virginia and was named after James I of England.
Death of Pocahontas	1617	Pocahontas was forced to convert to Christianity and change her name to Rebecca. She was then taken to England by her husband where she became sick and died.
First enslaved people at Jamestown	1619	First documented arrival of enslaved people from Africa at an English colony. There about 20 individuals who were sold at an auction and then sent to work across Virginia, mainly on tobacco plantations.
Pilgrim fathers	1620	102 settlers who arrived in Massachusetts to colonise the country as a kingdom for God. They were not sent by a leader but were fleeing religious persecution in England.

Key individuals

Samurai Bill (William Adams). One of the first Europeans to travel to Japan in 1600, he advised the Shogun and spent his life in Japan.

Pocahontas. A Native American woman who was kidnapped by the Jamestown colony. She was married to an Englishman and taken to England where she died.

Walter Raleigh. A privateer for Elizabeth I who attempted to set up colonies in Virginia. The main colony at Roanoke failed to survive.

"Angela". One of the first enslaved people to arrive at Jamestown. She was probably from Angola in Africa. Her real name has not been recorded and no picture was made. She possibly died in 1625.

Key vocabulary:

Colonise: to send settlers to a place to establish control there
Colony: an area of land ruled by another country.
Empire: a collection of territories ruled over by another country.
Indigenous American: the people who were first living in America before settlers arrived. Often called native Americans or First Nations people.
Jamestown: one of the first colonies settled in America by the English. In Virginia.
Merchant: someone who trades items to make money
Pilgrim Fathers: Puritans fleeing religious persecution in England who settled in America in 1620.
Plantations: farms set up to grow crops by enslaved people.
Privateer: someone who is employed by a ruler to steal from the ships of other countries.
Roanoke: a failed settlement in Virginia.
Settlers: those who travel to live in a colony; sometimes called colonists
Triangular trade: a trade in enslaved people who were taken from Africa to work in the Americas.

Furthering learning
Want to find out more about the early British Empire?

Preparation for a summative assessment

History – Year 7
Knowledge Organiser
Topic 4

Historical skill focus: cause and consequence

- Why do events happen?
- What is the impact of these events?

Can you explain why?

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

Explain why women found it more difficult to be rulers of England.

What to focus on:	Starting sentences
One or two reasons why the event happened	One cause of...
Think about the motives behind the actions of people involved and what these led to.	The most significant cause was...
	This cause led to...
Think about the types of reason like political reasons or religious reasons?	

Developing	Secure	Exceeding
I can identify the causes of an event.	I can describe how an event happened.	I can explain why an event happened in a PEE paragraph.
I can identify the impact of an event.	I can describe the impact of an event.	

Point = A key cause was...
Evidence = This cause led to...
Explain = This is important because...

Preparation for a summative assessment

History – Year 7
Knowledge Organiser
Topic 4

Pocahontas' portrait.

Unknown artist in England.
Made in about 1616

Historical skill focus: using evidence

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

Section C: Using evidence
How useful is this source to a historian investigating ? Write a paragraph to explain and try to use your own knowledge to support your ideas.

What to focus on	Starting sentences
What is the NATURE of the source? Does this make it useful? What is the ORIGIN of the source? Does this make it useful? What is the PURPOSE of the source? Does this make it useful?	Source A is useful because... This is shown by... The source is also useful due to its purpose which was to...

Developing	Secure	Exceeding
I can describe what I can see or read in a source.	I can make inferences using a source. I can ask questions about sources such as who made the source or when it was made	I can explain how a source can be useful/not useful in a PEE paragraph. I am starting to think about the nature, origin and purpose of the source and what its impact could be.

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

Point = One way the source is useful is...
Evidence = This is shown by the nature of the source...
Explain = This is useful because...

YEAR 7 – LINES AND ANGLES

Constructing, measuring and using geometric notation

@whisto_maths

What do I need to be able to do?

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

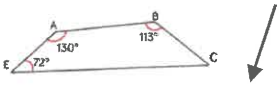
- Use letter and labelling conventions
- Draw and measure line segments and angles
- Identify parallel and perpendicular lines
- Recognise types of triangle
- Recognise types of quadrilateral
- Identify polygons
- Construct triangles (SAS, SSS, ASA)
- Draw Pie charts

Keywords

Polygon: A 2D shape made with straight lines
Scalene triangle: a triangle with all different sides and angles
Isosceles triangle: a triangle with two angles the same size and two angles the same size
Right-angled triangle: a triangle with a right angle
Frequency: the number of times a data value occurs
Sector: part of a circle made by two radii touching the centre
Rotation: turn in a given direction
Protractor: equipment used to measure angles
Compass: equipment used to draw arcs and circles.

Letter and labelling convention

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

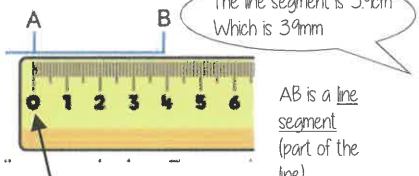


Angle Notation: three letters ABC
This is the angle at B = 113 °

Line Notation: two letters EC
The line that joins E to C

Draw and measure line segments

Conversions 1cm = 10mm, 1m = 100cm



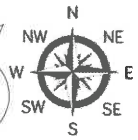
AB is a line segment (part of the line)

Make sure the start of the line is at 0.

Angles as measures of turn

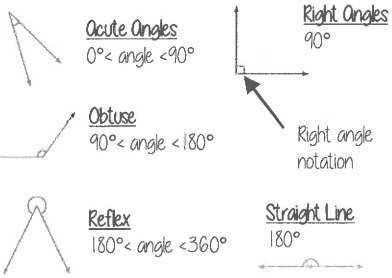
Clockwise Anti-Clockwise

East to South is a quarter turn clockwise



Quarter Turn	Half Turn	Three-quarter Turn	Full Turn
90° Clockwise	180°	270° Anti-Clockwise	360°

Classify angles



Acute Angles
0° < angle < 90°

Right Angles
90°

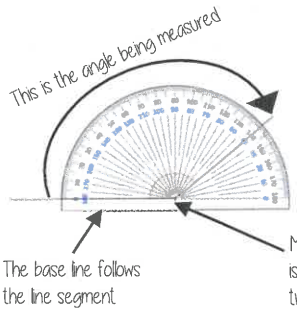
Right angle notation

Obtuse
90° < angle < 180°

Reflex
180° < angle < 360°

Straight Line
180°

Measure angles to 180°



Read from 0° on the base line. Remember to use estimation. This is an obtuse angle so between 90 ° and 180 °

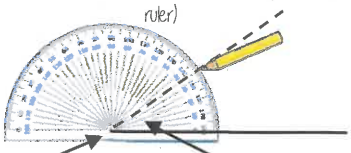
The base line follows the line segment

Make sure the cross is at the point the two lines meet

Draw angles up to 180°

Draw a 35° angle

Make a mark at 35° with a pencil And join to the angle point (use a ruler)



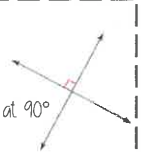
Make sure the cross is at the end of the line (where you want the angle)

The angle

Parallel and Perpendicular lines

Parallel lines
Straight lines that never meet
(Have the same gradient)

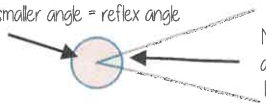
Perpendicular lines
Straight lines that meet at 90°



Angles over 180°

Use your knowledge of straight lines 180 ° and angles around a point 360 °

360 ° - smaller angle = reflex angle



Measure the smaller angle first (less than 180 °

Properties of Quadrilaterals

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

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

Rectangle
All angles 90°
Opposite sides are parallel

Trapezium
One pair of parallel lines

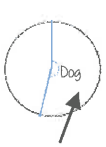
Rhombus
All sides equal size
Opposite angles are equal

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

Draw Pie Charts

Type of pet	Dog	Cat	Hamster
Frequency	32	25	3

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



This fraction of the 360 degrees represents dogs

$\frac{32}{60} \times 360 = 192°$

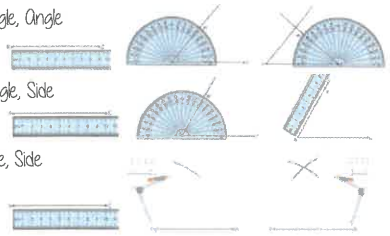
Use a protractor to draw This is 192°

SAS, SSS, ASA constructions

Side, Angle, Angle

Side, Angle, Side

Side, Side, Side



Polygons

3	- Triangle	5	- Pentagon	8	- Octagon
4	- Quadrilateral	6	- Hexagon	9	- Nonagon
		7	- Heptagon	10	- Decagon

If all the sides and angles are the same, it is a **regular** polygon

YEAR 7 — LINES AND ANGLES

@whisto_maths

Geometric reasoning

What do I need to be able to do?

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

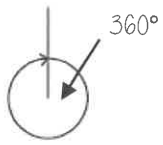
- Understand/use the sum of angles at a point
- Understand/use the sum of angles on a straight line
- Understand/use equality of vertically opposite angles
- Know and apply the sum of angles in a triangle
- Know and apply the sum of angles in a quadrilateral

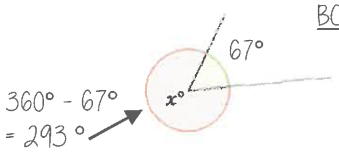
Keywords

Vertically Opposite: angles formed when two or more straight lines cross at a point.
Interior Angles: angles inside the shape
Sum: total, add all the interior angles together
Convex Quadrilateral: a four-sided polygon where every interior angle is less than 180°
Concave Quadrilateral: a four-sided polygon where one interior angle exceeds 180°
Polygon: A 2D shape made with straight lines
Scalene triangle: a triangle with all different sides and angles
Isosceles triangle: a triangle with two angles the same size and two angles the same size
Right-angled triangle: a triangle with a right angle

Sum of angles at a point

The sum of angles around a point is 360°



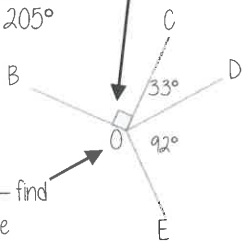


360° - 67°
= 293 °

Find angle BOE

90° + 33° + 92° = 205°
360° - 205°
BOE = 155°

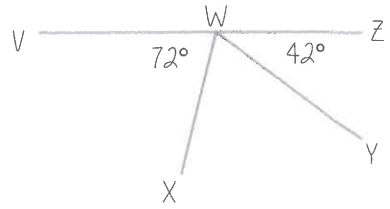
Angle notation — 90°



Angle notation — find this missing angle

Sum of angles on a straight line

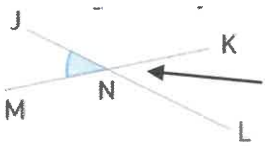
Adjacent angles that share a common point on a line add up to 180°



Find angle XWY

72° + 42° = 114°
180° - 114° = 66°

Vertically opposite angles

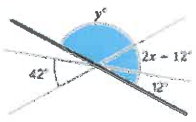


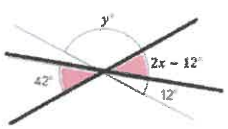
Angle JNM is vertically opposite to angle KNL

JNM = KNL

Vertically opposite angles are the same

Other angle rules still apply.
Look for straight line sums and angles around a point.

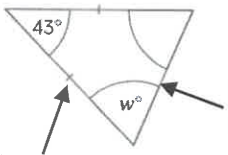




Form equations with information from diagrams:
$2x - 12 = 42$
$2x = 54$
$x = 27°$

Sum of angles in triangles

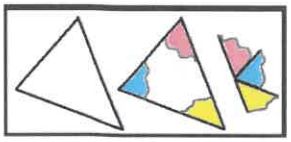
Sum of interior angles in a triangle = 180°



The two base angles will be the same size

Look at triangle notation. This indicates an isosceles triangle
∴ 180 - 43 = 137
137 ÷ 2 = 68.5°

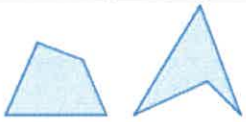
A triangle can only have ONE right angle



Have a go!
Tearing the corners from triangles forms a straight line which is therefore 180°

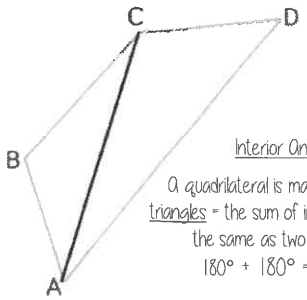
Sum of angles in quadrilaterals

Sum of interior angles in a quadrilateral = 360°



Convex Quadrilateral | Concave Quadrilateral

Interior angles are those that make up the perimeter (outline) of the shape

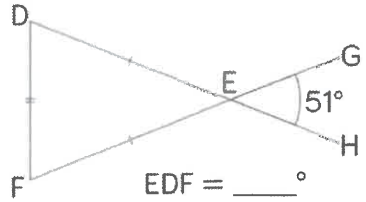


Interior Angles
A quadrilateral is made up of two triangles - the sum of interior angles is the same as two triangles.
180° + 180° = 360°

Angle Problems

Split up the problem into chunks and explain your reasoning at each point using angle notation

Keep working out clear and notes together



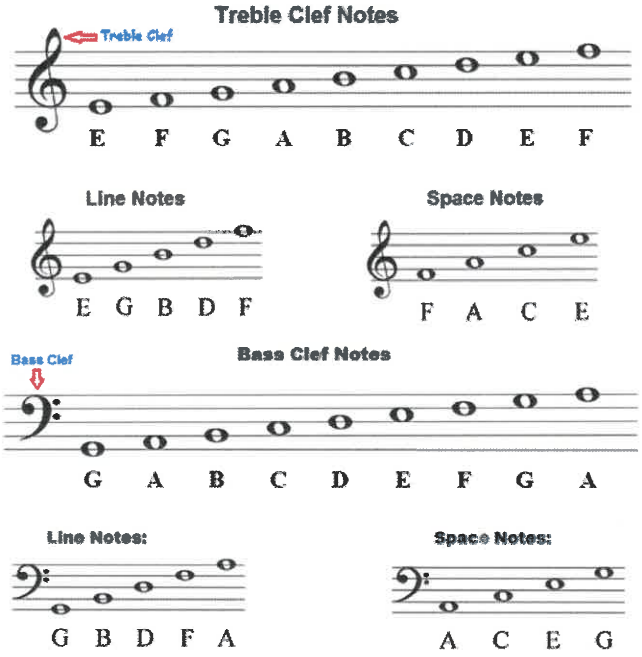
EDF = ____°

1. Angle DEF = 51° because it is a vertically opposite angle DEF = GEH
2. Triangle DEF is isosceles (triangle notation) ∴ EDF = EFD and the sum of interior angles is 180°
   180° - 51° = 129° 129° ÷ 2 = 64.5°
3. Angle EDF = 64.5°

Year 8 Unit 2 Knowledge Organiser: Theme and Variations

Section 1: Key Words	
Theme	The main melodic idea
Variation	Changing the theme to make it sound different
Ostinato	A repeating rhythm or melody
Tonic & Dominant	The 1st and 5th notes (or chords) of the key you are in.
Parallel motion	Two notes at a time: always the same distance apart.
Sequence	Repeating a short tune up or down one note each time.
Contrary motion	Moving in opposite directions.
Inversion	Play the tune upside down.
Retrograde	Play the tune backwards.
Countermelody	An extra tune on top.

Section 4: Notes on the Stave– Treble and Bass Clef:



Section 2: Key Words	
Call and response	A melody sung by one singer/performer is echoed by another singer/performer
Accompaniment	The music that is played to support the melody.
Tempo	The speed of the music
Dynamics	The volume of the music
Triple Time	Three beats in a bar.

Section 3: Note values chart

Note Symbol	Note Name	Note Value
	Minim	2 beats
	Semibreve	4 beats
	Crotchet	1 beat
	4 semiquavers	4 quarter beats (1 whole beat)
	Pair of quavers	2 half beats (one whole beat)
	Quaver	Half a beat

CHRISTIANITY KNOWLEDGE ORGANISER

Overview

Christianity is one of the world's major religions. It is the **world's largest religion**, with about 2.4 billion followers.

Christians (like Jews and Muslims) believe in one **God**, who created the world and all that is in it.

Christians believe in the teachings of **Jesus Christ**, who was a middle-eastern preacher and healer who lived around 2,000 years ago.

Christians believe that Jesus Christ was sent down to earth to save people, by taking their punishment and dying on the cross.

The holy book in Christianity is called **the Bible. A church** is a building designed for Christian worship.

An artist's image of Jesus Christ giving the 'sermon on the mount.'

Christian Beliefs

God's Creation

-Christians believe that God created the Earth and everything in it in 6 days, resting on the 7th.

-The story of creation tells Christians that at first everything was dark, until God intervened and created matter.

-Details about this are found in the Bible in Genesis 1 and 2.

The Holy Trinity

-Christians believe that God can be seen in three ways, known as the Holy Trinity:

-The Father – Creator of the world;
-The Son – Who came to Earth as Jesus;
-The Holy Spirit – God's power within Christians.

The Ten Commandments

-In the Bible, ten 'commandments' are shared, which Christians should aim to live their lives by:

1.You shall have no other Gods but me. 2. You shall not make for yourself any idol. 3. You shall not misuse the name of the Lord your God. 4. You shall remember and keep the Sabbath day holy. 5. Respect your father and mother. 6. You must not commit murder. 7. You must not commit adultery. 8. You must not steal. 9.You must not give false evidence against your neighbour. 10. You must not be envious of your neighbour's goods.

The Life of Jesus Christ

- Christians believe that Jesus was the son of God. He was born to ordinary parents, Mary and Joseph, in Bethlehem. Christians celebrate the birth of Jesus on 25th December – Christmas Day.

-Jesus travelled around, teaching people about God and helping the sick. He chose 12 men to travel with him. They were his special companions and are known as the disciples.

-Jesus was sentenced to death for calling himself the son of God. He had a final meal with his disciples (known as 'The Last Supper') before being crucified. He is said to have died for the sins of man.

Answers to Important Questions and Key Vocabulary

Where do Christians worship God?	 	-Christians can pray in any place, but the most common location is in a purpose-built building called a church. Churches can be very different – old, new, plain or highly decorated. Often, the floor plans of churches are shaped in a cross. -Church services often include hymns, prayers, and readings from the Bible. -Common church features include altar tables, lecturns, pulpits, fonts and stained glass windows.
What is the Bible?		The Bible is the holy book of Christians. It contains the Old and New Testaments. The Old Testament is similar to the Jewish Bible and was written before Jesus' birth. The New Testament contains stories about Jesus, written by those who knew him.
How do Christians believe that people should live their lives?		-Christians believe that people should be compassionate to one another, and show respect to God, themselves and one another. -Christians believe that praying to God helps them to say sorry for the things that they have done wrong, and thank them for the blessings given to them. -Christians believe that God wants them to carry on the good work that Jesus did in the world.
How many different types of Christians are there?		-There are many different denominations (types) of Christians. All Christians were once Catholics, but other groups branched off many years ago. -The biggest Christian denomination is still Catholicism. To Catholics, the Pope is Christ's representative on earth. Other major groups include Protestants (including Anglican/ Church of England faiths) and Orthodox.

Key Vocabulary

God
Jesus
Bible
Cross/ Crucifix
Commandments
Holy Trinity
Catholic
Protestant
Orthodox
Disciples
Saint
Church

Top 10 Facts!

1. Christians believe that God is everywhere, and sees and knows everything.
2. About 1/3 of the world's population are Christian.
3. The word Christ comes from the Greek word meaning Messiah – God's chosen one.
4. Although Christmas is celebrated on December 25th, no one knows exactly what date Jesus was born on.
5. Sunday is the holiest day in Christianity – many people meet to worship on Sunday.
6. There is very little written about Jesus before the age of about 30, when he began preaching
7. Jesus knew that he was going to be betrayed, and that he would die. He tried to warn his disciples of this at the Last Supper.
8. Jesus was buried in a tomb, but the tomb was found later. He then appeared to the disciples.
9. Jesus eventually went back up to heaven to be with God – this is called the ascension.
10. The cross is the symbol of Christianity – a reminder that Jesus was crucified.

Christianity Timeline

Beginning of time: God creates the world and everything in it.	Around 0 CE: Jesus is born in Bethlehem.	c.28CE: Jesus begins healing and preaching. He chooses 12 disciples.	c.30CE: Jesus feeds 5,000 with 5 loaves of bread and 2 fish!	c.33CE: Jesus holds the Last Supper. He is double-crossed by Judas.	c.33CE: Jesus is executed on the cross and then resurrects days later.	c.40CE: Church of Jerusalem – first Christian church – is founded.	c.1057CE: Orthodox Church breaks from Catholicism.	c.1534CE: Henry VIII forms the Church of England.

R.E: THE TEACHINGS OF JESUS KNOWLEDGE ORGANISER

Overview

-Jesus (also known as Jesus Christ or Jesus of Nazareth) was a preacher and religious leader.

-He is the central figure of Christianity. Jesus was born a Jew, but went on to begin Christianity.

-Jesus preached wherever people could gather together. He often taught through telling short stories with important messages, called parables.

-Jesus also taught people to follow the ten commandments, especially the most important two.

-He also stressed the importance of praying to God.

An artist's impression of Jesus preaching to a group of his followers.

The Parables and their Meanings

The Parable of the Sower

-A man sowing corn was scattering the seed in a field. It fell in several different places.

-Some fell along a path, where the birds ate it up. Some of it fell on rocky ground. When the plants sprouted from here, they quickly died because they had no moisture. Some seed fell in thorn bushes, which choked the growing plants. The rest fell in good soil - the harvest from which was good.

-In the parable, the sower is Jesus and the seed is the word of God. The seed on the path stands for those who hear God's message, but it is taken from them by the Devil. The seed on the rocky ground stands for those who do not believe deeply. The seed in the thorn bushes represents those who are too anxious about living the way Jesus recommends. Finally, the seed in good soil stands for those who truly follow the message, and because of this bear the fruit.

The Parable of the Lost Sheep

-In this parable, Jesus speaks of a shepherd with one hundred sheep.

-If one of the sheep were to go missing, the shepherd would leave the other ninety-nine to find it. He would feel incredible joy if he found the one sheep.

-Jesus explains that the shepherd is God and that 'there will be more joy in heaven over one sinner who repents than over ninety-nine respectable people who do not need to repent.'

-Through this parable, Jesus showed people that hope is never lost for those who have sinned.

-He encouraged those who had sinned to 'repent:' to show remorse for their sins and follow God.

The Commandments

The Ten Commandments

1.Worship no god but me.
2.Do not bow down to any idol or worship it.
3.Do not use my name for evil purposes.
4.Observe the Sabbath and keep it holy.
5.Respect your father and your mother.
6.Do not commit murder. 7.Do not commit adultery
8.Do not steal. 9. Do not accuse anyone falsely.
10. Do not desire anything that another owns."

Love the Lord

-Jesus explained that the most important commandment was to love the Lord.

-He said: "Love the Lord your God with all your heart, with all your soul, with all your mind and with all your strength."

-Jesus taught that this was the most vital thing a person could do.

Love thy Neighbour

-The commandment that Jesus taught was the second most important was loving one another.

-Jesus said "The second most important commandment is this: Love your neighbour as you love yourself."

-This stressed the importance of equality & treating all with respect.

Key Vocabulary

Jesus
Christ
Parable
Commandments
Prayer
Parable of the Sower
Represent
Parable of the Lost Sheep
Sinner
Repent
Neighbour

Prayer

-Jesus told his followers that exercise was not for public show. He expressed that it was a personal and private act between a person and God. When Jesus discussed his relationship with God, he used the term 'Abba.' This was an Arabic word used by children for father, showing their close, intimate relationship. He also taught his followers the Lord's Prayer.

Our Father in heaven, hallowed be your name,
Your kingdom come, your will be done,
On earth as in heaven.
Give us today our daily bread.
Forgive us our sins as we forgive those who sin against us.
Lead us not into temptation but deliver us from evil.
For the kingdom, the power and the glory are yours
Now and for ever. Amen.

Personal Spirituality – Key Questions

What messages are in the parables? How are they important in your life?

Which people guide you in your life?

How do people guide you in your life? What is 'good guidance?'

What do you think of the moral messages in the parables?

How do you treat the poor, the sick and the unpopular?

How do your communities make you feel?

What does it mean to love and be loved?

What are your feelings about prayer? How do you pray?

What are the most important relationships in your life?

B1 Chapter 10: Genes
Knowledge organiser

Activate
Question • Progress • Succeed

Variation

- The differences in characteristics of living things is known as **variation**
- There is a large amount of variation between different **species**, but within species many more characteristics are shared
- Even though two organisms may look the same, they will always have variation between them

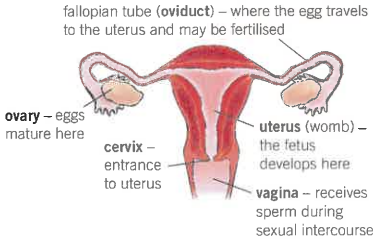
Inherited variation	Environmental variation
• Is anything that comes directly from your parents, anything that you inherit • Examples can include lobe less or lobed ear lobes and eye colour	• Is any type of variation that is caused by your surroundings • Factors that can cause environmental variation include diet, education and lifestyle

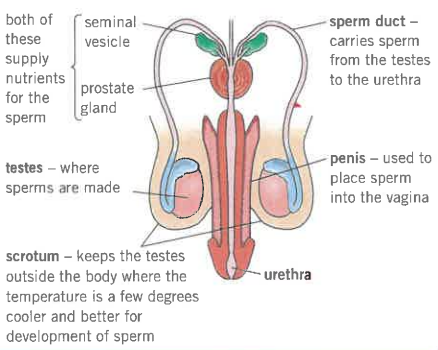
- Environmental factors can also impact inherited factors, for example a poor diet can affect height or your exposure to the sun can affect skin tone
- Characteristics which are inherited and not affected by environmental variation include natural eye colour, blood group and genetic diseases

Adaptations

- **Adaptations** are characteristics which organisms have developed to best survive in their surroundings
- Organisms with the best suited adaptations can breed and pass these on
- Those who are not best adapted will die out and not be able to pass on their genes

Reproductive systems



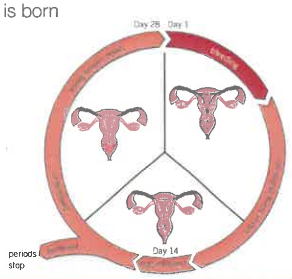


Adolescence

- **Adolescence** is the process in which a child changes into an adult, it involves both physical and emotional changes
- The physical changes alone in this time are known as **puberty**, these are caused by **sex hormones**

The menstrual cycle

- The **menstrual cycle** is the process in which an egg is released from an ovary and leaves through the vagina
- Day 1: blood from the uterus lining leaves through the vagina, which is known as a **period**
- Day 5: the bleeding stops and the uterus lining starts to re-grow
- Day 14: an egg is released from one of the ovaries during **ovulation**
- If the egg is **fertilised** than the menstrualcycle stops until the baby is born



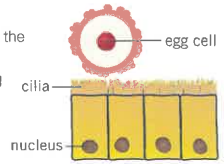
Fertilisation, implantation and gestation

- Egg cells and sperm cells are also called **gametes**, and each contains half the genetic information needed to form a complete organism.

Egg cells

An egg is released by the ovaries every month

The egg cell is moved along the oviduct towards the uterus by **cilia**



Sperm cells

Sperm cells are produced in the testicles/testes

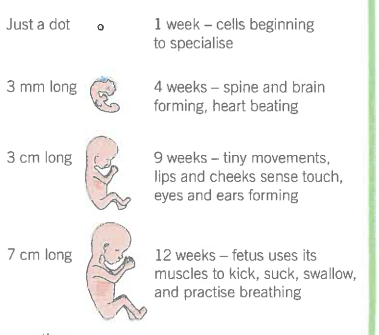
Sperm are mixed with nutrients and fluid from the glands to form **semen**

During sexual intercourse a man will release semen into the vagina (**ejaculation**)

If a sperm meets the egg **fertilisation** may happen

The fertilised egg may then **implant** in the uterus lining and form an **embryo** (ball of cells)

- During **gestation** the developing **fetus** needs nutrients from the mother, these are passed through the **placenta** which is connected to the fetus by the **umbilical cord**
- Nutrients are passed from the mother to the baby and waste products are passed back from the baby to the mother
- The baby is protected from bumps to the mother by the **amniotic sac** which acts as a shock absorber



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

adaptation adolescence amniotic sac cervix cilia egg cell embryo environmental variation fertilisation fetus gamete gestation implantation inherited variation menstrual cycle ovary oviduct ovulation penis period placenta puberty reproductive system scrotum semen sex hormones species sperm cell sperm duct testicles umbilical cord urethra uterus vagina variation

P1 Chapter 3: Energy
Knowledge organiser

Activate
Question • Progress • Succeed

Energy

- **Energy** is needed to make things happen
- It is measured in **joules** or **kilojoules**

- The **law of conservation of energy** says that energy cannot be created or destroyed, only transferred
- This means that the total energy before a change if always equal to the total energy after a change

Energy can be in different energy **stores**, including:

- **Chemical** – to do with food, fuels and batteries
- **Thermal** – to do with hot objects
- **Kinetic** – to do with moving objects
- **Gravitational potential** – to do with the position in a gravitational field
- **Elastic potential** – to do with changing shape, squashing and stretching

Food and energy

- Food has energy in a chemical energy store
- Different foods contain different amounts of energy
- Different activities require different amounts of energy
- Different people need different amounts of energy depending on what they do each day

Power and energy

- **Power** is a measure of how much energy is transferred per second
- Power is measured in **watts** (W)
- Each appliance has it's own power rating to tell us how quickly it uses energy
- We can calculate power with the equation:

$$\text{power (W)} = \frac{\text{energy (J)}}{\text{time (s)}}$$

Non-renewable energy

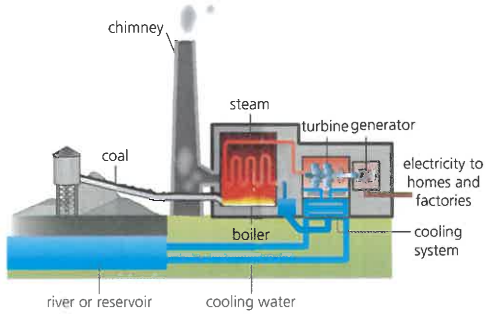
- **Non-renewable** energy cannot be replaced within your lifetime
- Non-renewable **energy resources** include coal, oil, natural gas and nuclear resources
- Coal, oil and natural gas are also known as **fossil fuels**, they release carbon dioxide when burned which contributes to global warming

Renewable energy

- **Renewable** energy can be replaced within your lifetime
- Renewable energy resources include wind, tidal, wave, biomass, solar, hydroelectric and geothermal
- Renewable energy resources do not produce much carbon dioxide, meaning that they have a smaller effect on global warming

Power stations

Thermal power stations burn coal, oil and natural gas, which are all non-renewable energy resources



Fuel is burned underneath water → Water is heated and turns into steam → The steam turns a turbine which turns a generator → Electricity is generated

Dissipation of energy

- We say that energy is **dissipated** when it is transferred to a nonuseful store, it cannot be used for what it was intended for
- Energy can be wasted through friction, heating up components or heating the surroundings
- **Efficiency** is a measure of how much of the energy has been used in a useful way, we can calculate this with the equation:

$$\text{efficiency (\%)} = \frac{\text{useful energy output}}{\text{energy input}} \times 100$$

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

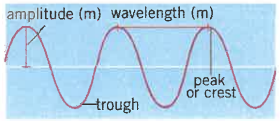
chemical · dissipated · efficiency · elastic potential · energy · energy resources · fossil fuels · graviational potential · joules · kinetic · kilojoules · law of conservation of energy · non-renewable · power · renewable · thermal · watts

P1 Chapter 4: Waves
Knowledge organiser

Activate
Question • Progress • Succeed

Properties of waves

- A **wave** is an **oscillation** or **vibration** which transfers energy from one place to another
- **Amplitude** – the distance from the middle to the top of bottom of the wave
- **Wavelength** – the distance between a point on the wave to the same point on the next wave
- **Trough** – The bottom of the wave
- **Peak** – The top of the wave
- **Frequency** – How many waves pass a fixed point per second, measured in Hertz (Hz)



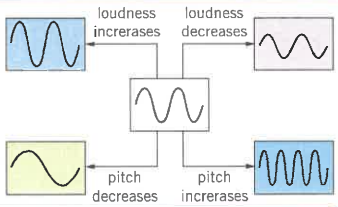
There are two main types of waves:

Transverse waves, e.g. light
- Travel at 90°direction of energy transfer
- Do not need a medium to travel through

Longitudinal waves, e.g. sound
- Travel in the direction of energy transfer
- Need a medium to travel through

Sound waves

- Sound waves are caused by the vibration of particles, sound travels quicker in a solid than a gas as the particles are closer together
- **Oscilloscopes** display sound waves on a screen
- Humans can hear between 20–20 000 **hertz** (Hz), but other animals have different ranges of hearing
- Sound waves above 20 000 Hz are known as **ultrasound**, thesesound waves are too high pitched for humans to hear



Hearing

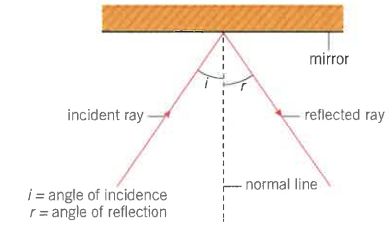
- The **pinna** directs sound along the **auditory canal** to the **eardrum** which will vibrate
- The vibration from the ear drum moves onto the ossicles which amplifies the sound
- This passes the sound to the cochlea where tiny hairs detect the vibrations and passes this along to the **auditory nerve** as electrical signals for our brain

Colour

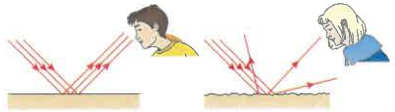
- Light can be split using a prism and is made up from different colours of light
- **Primary colours** can be mixed in order to form **secondary colours**
- Objects appear a certain colour as they absorb all other colours of light, but reflect the colour of light which they appear.

Reflection

- The **law of reflection** states that the **angle of incidence** will be equal to the **angle of reflection**

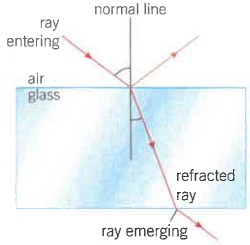


- For light reflecting off a smooth surface will form an image is called **specular reflection**
- Reflection off of a rough surface will not form an image and is know as **diffuse scattering**



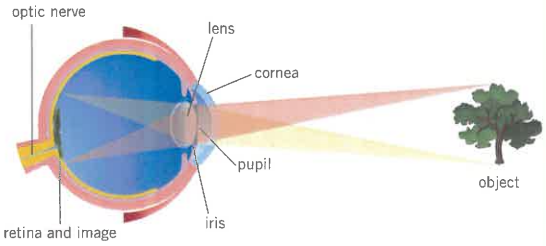
Refraction

- **Refraction** occurs when a wave passes between two different substances
- This happens as the wave will travel at different speeds in the different materials
- When the wave passes into a more dense material from a less dense material it will bend towards the **normal**, e.g. air into glass
- When the wave passes into a less dense material from a more dense material it bends away from the normal e.g. glass to air



Light and the eye

- Light entering your eye is refracted by the **lens**, focusing it on the retina and creating an inverted image
- **Photoreceptors** detect the light hitting your retina and send an electrical impulse to your brain
- If the light is not focussed on the retina or the eye, people cannot see properly



- Long sighted people have the light focus behind the eye, short sighted people have the light focus in front of the retina.
- Lenses can be used to refract the light in a way in which it will focus on the retina.

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

amplitude angle of incidence angle of reflection auditory canal auditory nerve diffuse scattering eardrum frequency hertz law of reflection lens longitudinal normal oscillation oscilloscope peak photoreceptors primary colour refraction secondary colour specular reflection transverse trough ultrasound wave wavelength