



Year 8

Knowledge Organiser

Work hard. Be kind. Belong.



THS

TIVERTON HIGH SCHOOL

Year 8

Art

Work hard. Be kind. Belong.

Year 8 AO3-Recording

1. Using a pencil to draw

- Use a sharp pencil
- Sketch outlines lightly using a feathered line
- Start to build up tone using a variety of pressures – harder for darker tones
- Use directional line to describe form
- Vary your mark making to capture textures
- Add the details at the end



2. Fineliner

- Draw the outline accurately.
- Build in tone using **cross hatching** and layering of marks.
- Use directional line to show form
- Use water and a paintbrush to bleed the ink to add tone.



3. Lighting in photography

- Artificial lighting is using lamps/torches and other man made lighting
- Natural Lighting – using the sun's light for a more subtle effect.
- Chiaroscuro – use of dramatic light to create strong light and shadows and contrast
- Side lighting – lighting to highlight one side of the subject
- Front lighting – Lighting from the front
- Back lighting – lighting from behind will create a hazy effect with some areas hidden.



4. Using a camera to record.

- Put on the neck strap
- Turn it on
- Check the battery
- Check the mode (Auto or Auto without flash)
- Look through the viewfinder to decide your composition. Remember – Rule of thirds/Foreground/mid ground/background/landscape or portrait.
- Push the button down half way to focus
- Push the button fully down to take the picture.



AO2- Use of materials

5. Mixed Media

Use of multiple materials built up in layers to create different effects.
Usually building up background first through to detail last.



6. Colour pencil

Sketch the outline lightly in pencil
Bold colours – Apply pressure when colouring.
Layering (Lightest colours first)
Blending
Directional shading
Use different tones of the same colour



7. How to paint with water colour

Start with the background, paint the whole space
Build up the tones in the back ground
Sketch the outline
Start with the lightest tones
Add brush marks to create layers working from lightest through to darkest colours.
Add the detail last.



8. Sculpting

Sculpture is the name for work in the visual arts that is in three dimensions.
Carving – taking material away (marble/wood)
Modeling – building material up (clay/metal)
Casting – using a mold to form a shape (plaster)



AO1 - Artists

9.

Artist analysis

Your page should you have a title, an image and a study/copy of their work. Use in keeping colours and materials that show your understanding of the artist.

9a. Content – What is the work about?

- What is the work about/of? Are there any clues/evidence to support this?
- What is the purpose or meaning of the work?
- Who would the intended audience be for this artwork? Why? How do you know?

9b. Process – How was the work made?

- What materials do you think the artist has used...and why?
- How have they been used? (layering)
- What are the stages the artist has gone through to get to the final outcome? (designing/drawing/Maquettes etc.)

9c. Form – How has the artist used composition/basic elements?

- Describe how the artist has used the basic elements? (How have they been used to convey meaning?). What effect does this create?
- Describe the composition of the work (fore/mid/back ground, Rule of thirds, landscape/portrait). What effect does this create?

9d. Connections – links and ideas

- How does their work connect to your project?
- How will this work inspire the development of your final outcome? (AO2)
- What are your next steps?

AO2- Designing and refining



10. Designing is the creative process when you make decisions about what and how you are going to make a piece of art.

You must make connections to artists and sources that you have researched.

The quality of your drawing when designing is important.

11. Refining your ideas is when you re design your work and make improvements as you experiment with materials and test your idea.

12. Presentation of your work should be in keeping, this means using the same colours and style.

DO NOT paint your whole page.

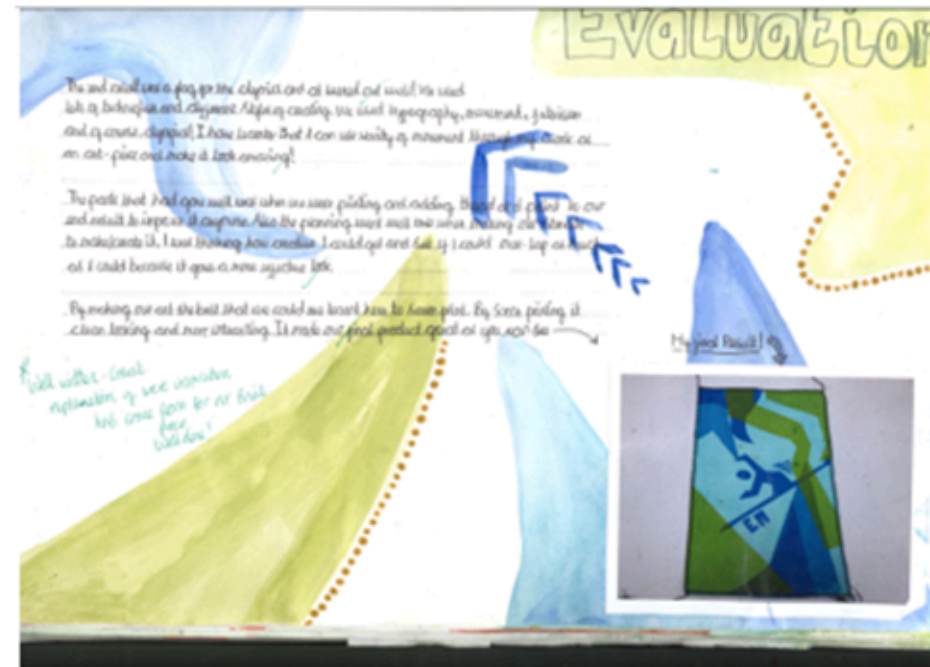
Create a title that matches the work too.

You could use torn paper or selected painted shapes.

AO4 – Final Outcomes/Evaluation

13. Final outcomes are the work that is produced at the end of a project. They should be the result of extended research experiments and investigations.

14. Evaluation happens at the end of a project. This is when you reflect on how you created your art work, what went well and how you connected your work to other artists and sources.



HEALTH AND SAFETY

Craft Knives

- Use a cutting mat
- The safety lid should only be off when cutting
- Carry beside you with the safety lid on
- Pay close attention when cutting
- Keep your hand well away when cutting
- Knives will be counted out and back in.



15.

16. Graphic communication uses the basic art elements alongside text to communicate ideas, concepts, messages and instructions.

17. Typography is an art concerned with **design** elements that can be applied to the letters and text.



18. Hot glue guns

1. Use a wooden safety board as a base.
2. Plug the glue gun in making sure the wire isn't across any walk ways.
3. Allow the gun to heat up for 5 mins before use.
4. Never touch the metal end.
5. Never touch the glue.

HEALTH AND SAFETY

6. Hold the pieces together for a few seconds until they have bonded.
7. Allow the guns to cool down before packing away.



19. Card construction

- Fold – lightly score with a knife and then bend
- Slot - create two slots on the pieces you want to join and move one into the other.
- Flange - Cut strips around the shape to bend back to glue on.
- Bend – score lines down the cardboard to allow it to bend.

Adhesives:

- Hot glue – follow steps in section 18.
- PVA glue
- Sticky tape
- Masking tape
- Glue stick





Year 8

Computing

Work hard. Be kind. Belong.



Tiverton High School Year 8 Computing Spring Term Knowledge Organiser

Types of Network | Key Construct 4: Networks and Communication

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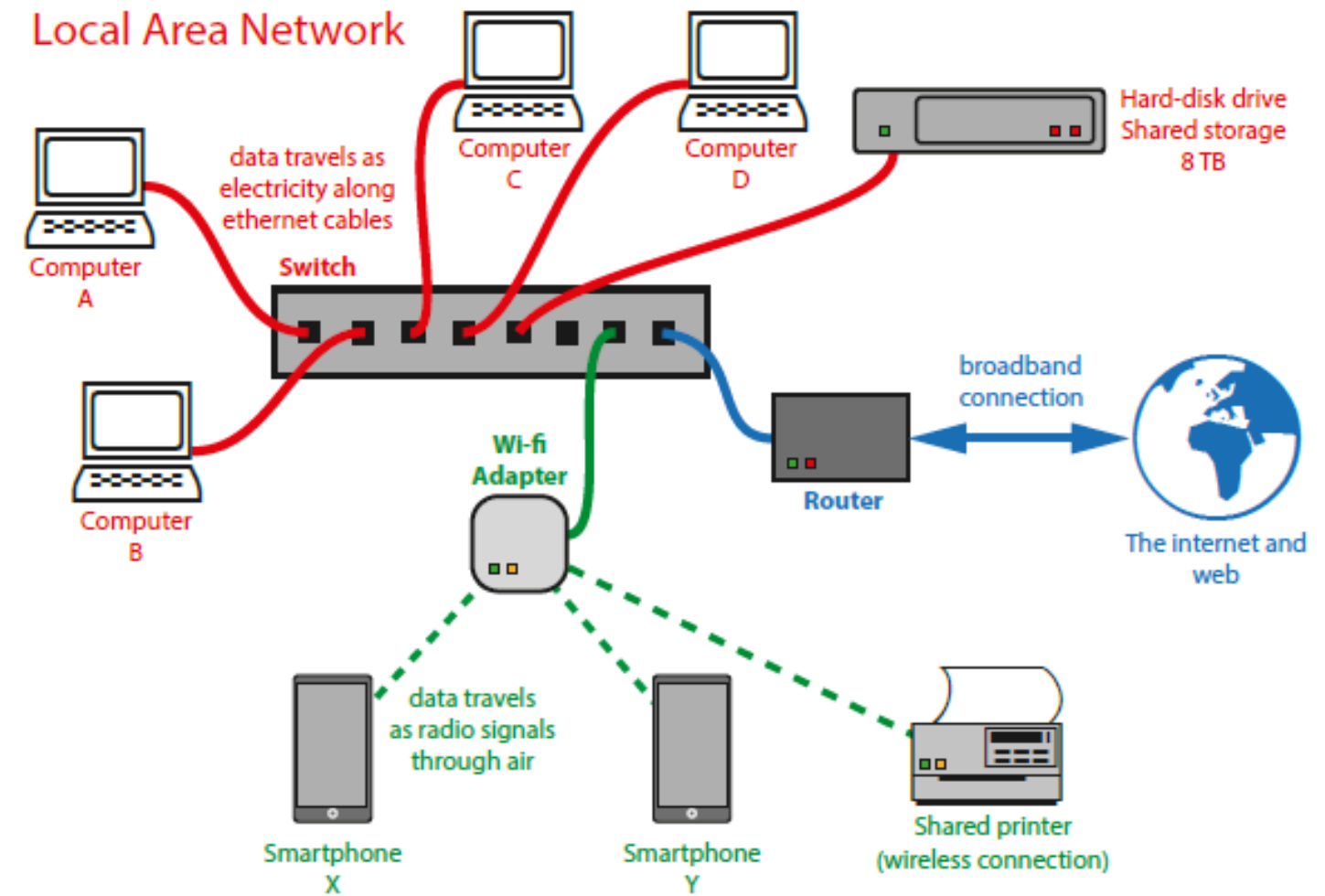
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Local Area Network



Transmission Media | Key Construct 4: Networks and Communication

Connections can be made between devices using different methods:

Copper cables



Data is transmitted over copper cables using **electricity**. Copper cables allow relatively fast transmission but can be affected by other cables nearby, by **electrical interference** or **lightning strikes**. Copper cables can make it very easy to connect new devices and are very cheap, but they can only be used over relatively short distances as the transmitted data signals weaken with distance e.g. up to 100m.

Fibre-optic cables



High-speed, high-capacity bundles of **glass fibre** that carry data as **light**, rather than electricity. Fibre-optic cables are expensive and technical to install, but can be used reliably over very long distances, such as connecting different countries together under the sea. Fibre-optic allows **extremely fast data transmission** and many people can share the use of the same cable due to its massive data capacity.

Wi-Fi links



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Micro-wave links



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Bluetooth



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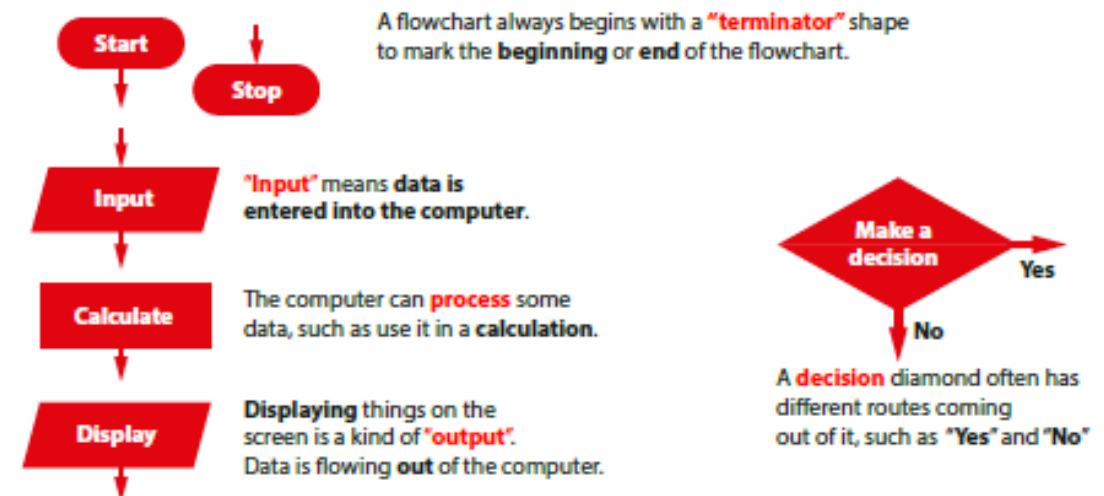
Problem solving and computational thinking | Key Construct 6: Problem Solving and Programming

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Abstraction means **choosing only the most important details that are relevant to solving the problem**, while **ignoring** other details.

A **program** is a sequence of instructions that the computer will carry out (execute). An **algorithm** is a precise set of written steps that describe exactly how to solve a problem. A **flowchart** is a diagram that shows how an algorithm works.

Flowchart symbols | Key Construct 6: Problem Solving and Programming





Tiverton High School Year 8 Computing Autumn Term 2 Knowledge Organiser

Different kinds of software programs | Key Construct 2: Working with Software and Documents

An **operating system** is a program that makes your computer or your phone **easier to use**.

Examples of **operating systems** include:

Microsoft Windows and **Ubuntu Linux** for **desktop PCs** and **laptops**;

Apple MacOS for **Apple Mac computers** and **Macbook laptops**;

Google Android for **Samsung phones** and **tablets**;

Apple IOS for **Apple iPhones** and **IPad tablets**.



The operating system software **automatically** loads into your computer's memory as soon as you switch the computer on. when the computer is loading the operating system, we say that the computer is "**booting up**" - it is getting ready for you to use.

Once the operating system has finished loading and it is running, the computer is ready to use. You can now load any program that you would like to use.

Without an operating system, most computers would be **too difficult to use** because they are **very** complicated machines.

Software applications are **general purpose programs**. They can be applied to solve many different kinds of problems. **Small** application programs that you use on your **phone** or **tablet** are called "**apps**".

Some examples of software applications include:



Word Processing applications - to create text documents;



Spreadsheet applications - to work with numbers, data, calculations, statistics, graphs and charts;



Databases - to store and search through large amounts of information about people or things;



Presentation software - to display facts, figures, pictures, charts and video clips on a large screen to an audience;



Graphics Packages - to create and edit photographs, illustrations and diagrams;



Audio and video editors - to edit sounds, music, podcasts and video recordings.

Web-pages can be **displayed** or **viewed** in a program called a **web-browser**.
Examples of web-browsers include **Microsoft Edge**, **Apple Safari** and **Google Chrome**.



File-types and compression | Key Construct 5: Data Representation

A **file** is a **persistant** store of data that is held on a **secondary storage device** e.g. on a hard-disk drive.

Music and video files can contain a lot of data. Large files and streams of data can take a long time to transfer over the Internet. If the file can be **compressed**, either by **reorganising** or **reducing the amount of data**, then it can be sent and received **faster**.

Compression re-organises a file of data and saves it as a new compressed file.
The compressed file usually has a **smaller file size** than the original.

It takes the computer **time** to compress the data - it's got to work out how to organise the data in a more **efficient** way. Before you can use the data again, the computer needs to **de-compress** the file. It must **re-organise the data** again into a form that can be used easily.

Text Documents

- .txt** is an uncompressed **plain text document**. The text file contains only **unformatted text characters**.
- .rtf** is an uncompressed **rich-text file**.
The text file contains characters which can be **formatted** using **bold**, **italics**, **colour**, **font sizes** etc.
- .pdf** is an Adobe **Portable Document Format** file.
It can hold **rich-text**, **font definitions** and high-quality **vector diagrams**.
Because the file contains the **font definitions** for each font face used it is **portable** - the document will look the same, regardless of the type of computer or phone being used.
PDF files can also compress text and pictures to reduce the amount of data that they hold.

Images/Pictures

- .bmp** is an uncompressed **bitmap image** format used widely by Microsoft Windows programs.
- .tif** is an uncompressed **high-quality bitmap image** that can contain **millions of colours**.
TIFF file sizes can be very large as they often contain so much uncompressed data.
- .jpg** is a bitmap image that uses **compression**. Some of the finer details may be **lost** when compressing the image. JPEGs are used widely for **photographs** and can include **millions of colours**, making pictures very **realistic**.
- .gif** is a compressed bitmap image that can only use up to **256 different colours**.
This is only suitable for **simple graphics** and **animations**, or regions of **flat colour** that are all the same.
- .png** is a **Portable Network Graphic**. This stores **high-quality graphics** using one or more **separate layers**.

Audio/Sound/Music

- .wav** is an **uncompressed audio waveform**. These files are often very large, but result in **high-quality audio**.
- .mp3** is an **audio file** that uses **compression**.
The MP3 file is usually approximately 10 times smaller than their original. The sound quality can be quite low.

Video/Movies

- .avi** is an **uncompressed video file** used widely by Microsoft Windows programs.
- .mp4** is a **video file** that uses **compression**.

Programs

- .exe** is an uncompressed **executable program file**.

Units of data storage | Key Construct 5: Data Representation

"bit" means "**binary digit**".

A bit is the smallest amount of data that a computer can store.
A bit can either be a **0** or a **1** value. It uses an **ON** or **OFF** voltage in a circuit.

8-bit binary means a pattern of **8 binary-digits**.

8-bits allow **256 possible combinations** between **00000000** and **11111111**.

This is why 8 bits can represent between **0** and **255** in base ten.

- 1 byte** = **8 bits** (an ASCII character takes 1 byte)
- 1 kilobyte** = **1000 bytes**
- 1 megabyte** = **1000 kilobytes** (or 1000 x 1000 bytes)
- 1 gigabyte** = **1000 megabytes** (or 1000 x 1000 x 1000 bytes)
- 1 terabyte** = **1000 gigabytes** (or 1000 x 1000 x 1000 x 1000 bytes)

Number bases

Binary means base-2
Computers use binary to store all data.

Denary means base-10
People usually use denary in everyday life.

**Converting Binary (base two)
to Denary (base ten)**

128	64	32	16	8	4	2	1
0	1	0	0	1	0	1	0

$(1 \times 64) + (1 \times 8) + (1 \times 2) = 74$ in base ten



Tiverton High School Year 8 Computing Summer Term Knowledge Organiser

Important programming Ideas | Key Construct 6: Problem Solving and Programming

You can **create** software by writing new programs. You tell the computer what to do, step-by-step, giving it instructions that it will follow.

When you have finished making your program of instructions, you can **run** through them, asking the computer to carry the instructions out one-at-a-time in order. This is called **executing** a program.

You write the program instructions using a **programming language**. You can't just write your program instructions using ordinary english language because many sentences in the english language are too complex for a computer to break down.

There are lots of different programming languages that you can use to make a new program. Each one has different advantages but some are more difficult to learn than others.

Small BASIC and **Python** are two programming languages that are quite easy to learn for beginners.

To write your program instructions for a new program, you must type them carefully into a **text editor**.

If you make a **mistake**, an instruction may not make sense to a computer. This is called a **syntax error**. When you try to run your program, the computer can tell you if it finds a syntax error. The computer may suggest which line in your program needs to be fixed. You can then look for mistakes in your typing.

Programming techniques you can use when writing programs | Key Construct 6: Problem Solving and Programming

Input means gathering some data from the keyboard or other input device and storing it in a **variable**.

Output often means **displaying** something on the **screen**.

You can display **words**, **numbers**, or the value of **variables** that are stored inside the computer's memory. This is called **text output**.

Many programming languages can also be used to **draw lines** and **shapes** on the screen. This is called **graphical output**.

A **sequence** is a group of program statements that are executed in the **correct order**, one after the other.

A **variable** is a **named value** that can **change** while your program is running e.g. **score**

Assignment means giving a **value** to a variable.

Iteration means repeatedly executing parts of the program **again and again**. This is sometimes called a **loop**.

Selection means making a **decision** to select which part of the program code should be executed.

When you tell the computer to calculate something, you need to use the correct symbol. Programming languages sometimes use different symbols to those you usually use in a Maths lesson.

Performing arithmetic and calculating

+ Addition - Subtraction * Multiplication / Division

Symbols to help the computer make comparisons between things

< less than > greater than <= less than or equal to >= greater than or equal to

Writing simple programs in Small BASIC | Key Construct 6: Problem Solving and Programming

Assignment - storing a value in a variable inside the memory of the computer:

```
score = 10
password = "Cu5tArd"
```

Text values must always be enclosed between " **speech marks**), this shows the computer where the text begins and ends, even if the text contains spaces.

Input - **gathering** a new **number** or **text value** and storing them using **variables**:

```
mynum = TextWindow.ReadNumber()
mytext = TextWindow.Read()
```

Output - **displaying** text messages or the value of a variable on the screen:

```
TextWindow.WriteLine("GAME OVER!")
TextWindow.WriteLine(mynum)
```

Iteration - **repeatedly** executing something a certain number of times:

```
For number = 0 To 100 Step 10
    TextWindow.WriteLine(number)
EndFor
```

Iteration - **repeatedly** executing something until something special happens:

```
While time < 60
    TextWindow.WriteLine(time)
    time = time - 5
EndWhile
```

Selection means **making a decision** to select which part of the program code should be executed:

```
If lives > 0 Then
    TextWindow.WriteLine("Lost a life!")
Else
    TextWindow.WriteLine("Game Over")
EndIf
```

A **sub-routine** is a **part** of your program. You can give the sub-routine a **name** to describe what it does.

```
Sub DrawOneSquare
    For side = 1 To 4
        Turtle.Draw(100)
        Turtle.Turn(90)
    EndFor
EndSub
```

After you have made a **sub-routine**, you can **activate** it whenever you like from anywhere in your program code. Use the name of the sub-routine to activate it. This is also known as "**calling**" a sub-routine (you **call** it into action).

```
For shape = 1 To 10
    DrawOneSquare()
    Turtle.Turn(36)
EndFor
```




Tiverton High School Year 8 Computing Spring Term Knowledge Organiser

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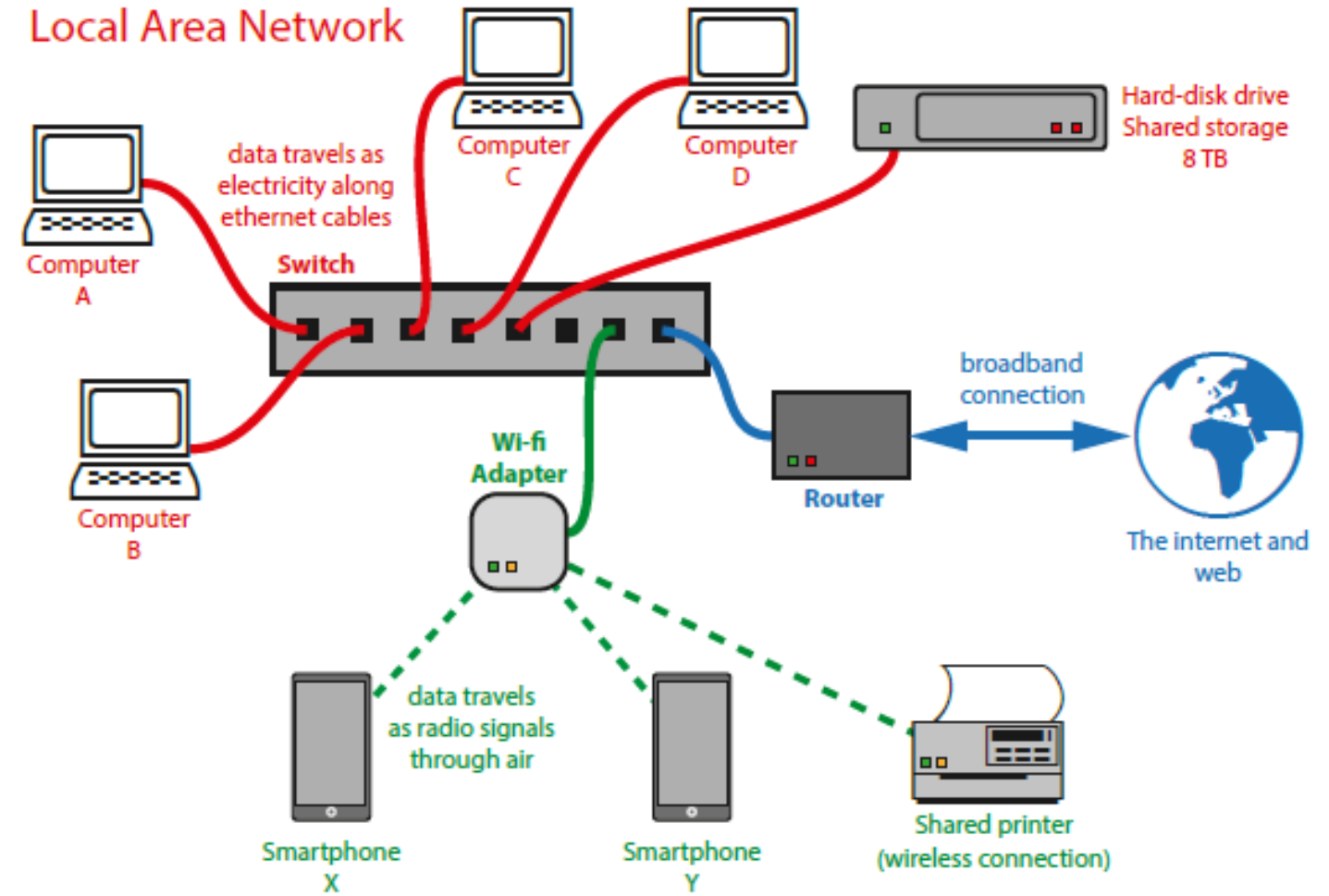
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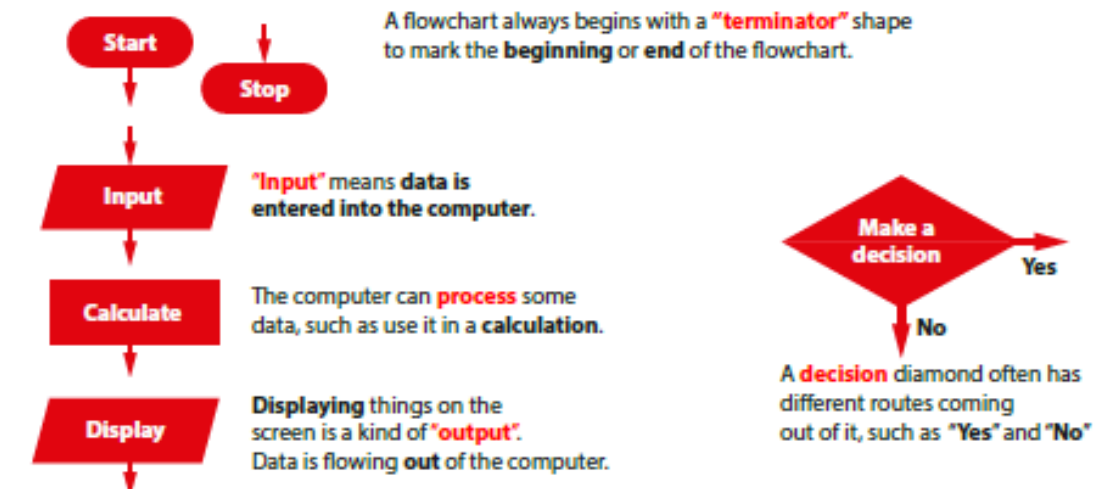
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TIVERTON HIGH SCHOOL

Year 8

Drama

Work hard. Be kind. Belong.

Developing Drama Skills

Exploring Component Knowledge of Drama



1. Theatrical Elements



1A: Vocal Skills



Pace: how fast or how slow the character speaks

Power: how loud or how quiet a character speaks

Pitch: how high or how low a character speaks

Pause: moments where the character stops talking

Tone: shows what the character is thinking or how they are feeling

Accent: the way someone talks depending on where they come from.



1B: Physical Skills



Facial expression: showing emotion of the character through the face

Body Language: using your body to show the character's emotion

Physicality: using your body to show the character

Gesture: a movement of part of the body to show meaning.

Mannerisms: habitual gesture or way of speaking or behaving in role

Gait: the way a character walks

Exaggeration: Making performance bigger than real life.

Stance: The way a character stands

Posture: The physical alignment of the body (good posture / bad posture)

Eye Contact: Looking directly at or avoiding looking at someone

2. Theatrical Skills



2. Theatrical Skills



Freeze frame: A frozen moment in time expressing a character / scenario.

Still image: frozen image that symbolises an idea or relationship

Thought tracking: a character saying their thoughts aloud

Hot seating: a character is asked questions and the actor responds in role

Narration: telling the audience what is happening

Mime: suggesting action, character, or emotion without words

Improvisation: creating a scene without a script

Proxemics: the use of space on stage to create meaning

Levels: the use of height to show status

Status: the power one character has over another

Physical Theatre: creating objects, set or meaning through the use of the body

Soundscape: a combination of sound created by performers to create – location, atmosphere or emotion

Atmosphere: the feeling or emotion created within a scene

Split scene: two different locations or moments are shown on stage at the same time

3. Command Words

Words



3. Command Words



Identify

Can you find where in the performance they have used a particular skill?

Analyse

Why have they used this technique / skill, what was the effect?

Evaluate

Were they successful when using this technique / skill? If so, why? If not why not?



4. Stage positions



Upstage right	Upstage centre	Upstage left
Stage right	Centre stage	Stage left
Downstage right	Downstage centre	Downstage left

AUDIENCE

Stage positions are always from the ACTORS perspective. This means when looking at the stage from the audience's point of view stage left is on the right and stage right is on the left.

Upstage = far away from the audience

Downstage = close to the audience

4. Stage Positions

Positions

Developing Drama Skills

Exploring Component Knowledge of Drama



1. Theatrical Elements



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THS

TIVERTON HIGH SCHOOL

Year 8
DT

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Design and Technology – Year 8

In Design and Technology there are different areas of study.

These are covered under the Key Constructs. They are:

- **Understanding Materials,**
- **Understanding Product Function**
- **Designing Solutions**
- **Manufacturing and Prototyping**
- **Health and Safety in Design**
- **Evaluation and improvement**

There is also the important overarching knowledge needed about the **Design and Technology Process** and Key Terms such as **ACCESSFAME**.

2. Health and safety - 5 things do you need to consider when in the work shop to keep you and others safe?

1. Wear goggles
2. Wear an apron
3. Tie long hair back when using equipment
4. Ensure only 1 person uses the machinery at a time
5. Clamp work down when drilling

3. Specification a list of requirements that your product must meet/include.

Design Context Gives you the background of the problem and the design brief so you have more information about why the design brief needs addressing.

Design brief The instructions that a client gives to a designer about what they want a product to be like and why they need/want it.

User profile knowing what the person who you are designing the product for likes/dislikes. This is used to inform design decisions.

4. Analysing using ACCESS FAME key words

To help us remember key bits of information for investigating, designing, analysing and evaluating we use:

Aesthetics What does the product look like? Does it have a theme or is it inspired by a designer? What do you like about it? How could improve it's aesthetics?.

Cost How much does the product will cost? How much does it cost to manufacture? Is it affordable to its intended market?

Client Who is the product sold by? Is their branding? Is it necessary? Will the client be happy with the product?

Consumer Will the intended consumer for the product want to use it? Could it be developed further for the consumers needs?

Customer Has the designer considered the costumers needs? How can the ensure the customer will want to purchase the product?

Environment Is the product environmentally friendly? How can they ensure that the product has less impact on the environment?

Size- Is it too big/small? Do they need to rethink the dimensions of the product?

Safety Has the designer considered all safety considerations? Is it fully appropriate for the age range of the intended consumer?

Function Does the product work as intended? What other features could be included to improve the product?

Anthropometrics- Is the product fit for purpose in terms of the average size of it's intended consumer?

Materials and manufacture What it is made from and how it is made? Would an alternative material be better suited based on their working properties?

Ergonomics Is the product comfortable to use? Could it be shaped better?

5. Types of production

One off production- each product is unique/ its own individual design

Batch production The production method used to make a specific quantity(batch) of identical products. Normally 3-100 products

Mass Production Mass production enables companies to produce larger quantities with fewer workers. Instead of having to pay several workers to complete a task by hand, manufacturers use machines to produce goods much faster. This allows companies to sell their products at a lower cost without losing profit.

Continuous Production Similar to mass production in it's method. But, the demand/need for the product is a lot of higher, such as Toilet paper.

6. Tools for Metal and what they are used for.

Scribe for Marking on to metal.

Centre punch for making an indent in a piece of metal for the drill bit to locate to

Engineers Square for marking 90 degree lines from the edge of a piece of metal

File this has hundreds of teeth to remove small amounts of metal or make edges smoother. This used for smoothing and can also be used on metals and plastic.

Engineers Vice. For holding pieces of metal in place while you work on them.

Steel rule Square edge ruler that 0 starts at the very end.

Clamp Holds materials in place when drying or working on the material itself.

7. Planned obsolescence

When a product is designed to become useless quickly. E.g. disposable razor/ phone

8. Veneering Is when thin slices of wood thinner than 3 mm, are glued onto panels to produce a decorative finish such as doors and panels for cabinets.

Composite materials are made by bonding two or more different materials together to improve their working properties.

9. Wood-Cheap Softwood – Origins

Grown in colder climates fast growing=cheap and plentiful, Needles for leaves Evergreen **Pine-** Cheap but knotty use cheap furniture

10. Wood-Expensive hardwood - origins

Warmer climates Slow growing = more expensive broad leaves tighter grain denser and harder than soft wood **Oak-** tough, very strong, attractive grain, finishes well. **Mahogany-** red/brown in colour easy to work with, expensive, good quality furniture/ jewelry box.

11. Properties of materials

Physical properties are the traits a material has before it is used.

Absorbency - the ability to soak up moisture, light or heat, eg natural materials (such as cotton or paper) tend to be more absorbent than man-made materials (such as acrylic or polystyrene)

density - how solid a material is. This is measured by dividing mass (grams) by volume (cm³), eg lead is a dense material

fusibility - the ability of a material to be heated and joined to another material when cooled, eg webbing is fusible and can be ironed onto fabrics

electrical conductivity - the ability to conduct electricity, eg copper is a good conductor of electricity

thermal conductivity - the ability to conduct heat, eg steel is a good heat conductor, whereas pine is not

Working properties are how a material behaves when it is manipulated

strength - the ability of a material to withstand compression, tension and **shear**, eg in woven fabrics cotton isn't as strong as wool when pulled

hardness - the ability to withstand **impact** without damage, eg pine is easier to dent with an impact than oak; therefore, oak is harder

toughness - materials that are hard to break or snap are tough and can absorb shock, eg Kevlar in bulletproof vests is a very tough material

malleability - being able to bend or shape easily would make a material easily malleable, eg sheet metal such as steel or silver is malleable and can be hammered into shape

ductility - materials that can be stretched are ductile, eg pulling copper into wire shows it is ductile

elasticity - the ability to be stretched and then return to its original shape, eg elastane in swimming costumes is a highly elastic material

12. Textiles construction

Temporary construction is using pins and tacking thread to hold 2 pieces of fabric together.

Permanent constructions is using the sewing machine.

13. Natural fibres are harvested from plants and animals. They are **renewable** resource- (you can produce more of them) They are **biodegradable** (can be broken down). They can be recycled.

Plant- **Cotton**

Animal- **wool and silk**

A **property** of a fibre is what it can offer as a material for a product. E.g. Wool is a good insulator, so it would be good to use as a jumper to keep whoever wears it warm.

14. Synthetic fibres or man made fibres

These are made from fossil fuels Synthetic fibres are less sustainable, can be made to have any properties????resistant to mould and decomposing. They are not very absorbent to difficult to add colour.

Types of fabric

Elastane- stretchy used for sports wear

Polyester- does not crease and it is used for shirts

Polyamide- hardwearing and used for carpets.

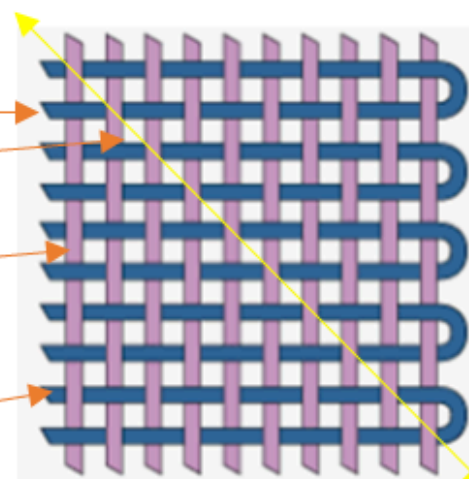
15. Woven fabric.

Selvage- the edge

Bias- the diagonal

Warp- yarns running from top to bottom

Weft- a continuous yarn running right to left then left to right weaving in and out of the warp

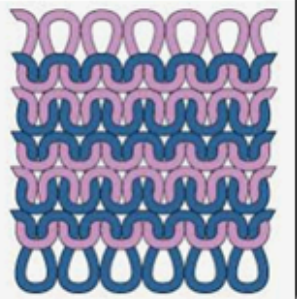
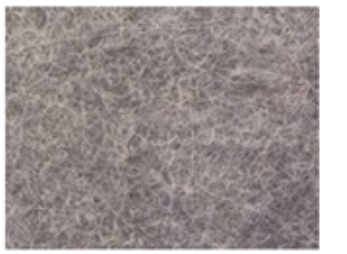


16. Bonded fabric/ Non woven fabric

Examples are **Felt** which is made from wool. The fibres are bonded together with pressure, moisture and heat.

This fabric is not very strong or they do not stretch.

Knitted fabrics are made by interlocking one or more yarns together using loops. Air is trapped so they insulate. They stretch more than woven fabrics.



17. CAD/CAM stands for Computer aided design/ computer aided manufacture. The advantages of using CAD. You can email the designs, You can make changes easily, you can work on the same designs all over the world.

Explain the process.

CAM – Machinery used to create products from CAD files. I.e. laser cutter.

Produces identical products multiple times. Advantages – fast make more than one at a time and can produce difficult designs.

18. Most **polymers** are synthetic and have been designed by **chemical engineers**. Polymers fall into two categories:

- **thermosetting** plastic or **thermoset**
- **thermoforming** plastic or **thermoplastic**

'Thermo' indicates that heat will be involved in the way the polymer is shaped, and 'set' means that once the polymer has been set in that shape, heat will not alter the form.

Thermoforming plastic, however, can be heated and shaped, then heated and shaped again. These polymers are also often referred to simply as 'thermoplastics'.

A popular polymer to use in schools is **acrylic**. This can be heated and bent using a **line bender** and, as it is a thermoforming polymer, it can then be reheated and reshaped. For example, a hairdryer would not be made from acrylic as it would not withstand the heat and would deform when used.

Four popular polymers used in schools are:

1. acrylic
2. **polypropylene**
3. **high impact polystyrene (HIPS)**
4. **polylactic acid (PLA)** (if the school has a 3D printer)





THS

TIVERTON HIGH SCHOOL

Year 8

English

Work hard. Be kind. Belong.

1. Context

Can you link context to a specific moment in a text and help you understand the writer's intentions at this point?

- **Author information:** What do they usually write about, what influenced them, what was their life experience?
- **Era:** When was it written? What did people at the time believe about the world that was different to today?
- **Historical Events:** Were there any big events that will have affected the characters in the story?

- **Location:** Where was the book written or set? How does this affect what we can expect from the characters in terms of how they act the way they do and why?
- **Genre** Are there any techniques that are used in the story that are common in this particular style of novel?
- **Audience** How would an audience in this time/location react differently to us?

2. Novel Scheme: *The Giver*

Title: *The Giver*

Author: Lois Lowry

Published: 1993

Background: Lois Lowry is an **American** author born on March 20, 1937, in Honolulu, Hawaii. She has written over 45 books for children and young adults.

Era: In 1993, there was a lot of public discussion and focus on 'political correctness', which is echoed in some of the society that Lowry portrays. One key debate was **the value of celebrating differences between people versus the value of making everyone in a society feel that they belong**. It explores the issues of difference – do we ignore significant differences because we do not want to be seen to be prejudiced or discriminatory, or do we celebrate diversity? Lowry would argue that tolerance is essential but not at the cost of true diversity.

Key Information: Lowry's writing often explores complex themes such as freedom, individuality, and society.

Setting: The story is set in a futuristic society where emotions and memories are suppressed to maintain order.

Themes: freedom vs. control, individuality, conformity, community, family

Definitions

Dystopia: A dystopia is an imagined society in which there is great suffering or injustice.

Key Features: Oppressive, controlling or non-existent government, lack of freedom, controlled information. Either there is a huge income gap between the poor and the rich, or everyone faces extreme poverty. Propaganda put forth by the government or ruling class takes control of human minds.

Utopia: Perfect, or near perfect, information, independent thought, and freedom are promoted. A figurehead or concept brings the citizens of the society together, but not treated as singular. Citizens are truly free to think independently. Citizens have no fear of the outside world. Citizens live in a harmonious state.

3. War Poetry

Title: War Poetry – a collection of poems from different times

The war poets often expressed the harsh realities and emotions of war through their poetry. Many war poets, including Sassoon and Owen, directly experienced the horrors of World War I. War poetry often serves as a **powerful reminder of the human cost of conflict and the importance of peace**.

John Scott of Amwell – *The Drum* – 1731-1783

Alfred Lord Tennyson - *The Charge of the Light Brigade*

Born: 1809 British poet Laureate during the Crimean War.

The **Charge of the Light Brigade** was a military action during the Crimean War. On October 25, 1854, British light cavalry, led by Lord Cardigan, launched a frontal assault against a well-prepared Russian artillery battery. Unfortunately, the order was misunderstood, and the cavalry charged into a "Valley of Death," resulting in heavy losses.

Wilfred Owen – *Exposure, Anthem for Doomed Youth*

Born: 1893. British soldier and poet in World War I. Owen's poetry vividly portrays the horrors of trench warfare.

Anthem for Doomed Youth: Explores the impact of war on young soldiers and their families during World War I.

Siegfried Sassoon – *The Conscript*

Born: 1886. British soldier who fought in World War I. Known for his anti-war stance and critiques of military leadership.

World War I: A major conflict from 1914 to 1918, involving many countries, including Britain, France, Germany, and others.

Goran Simic *The Sorrow of Sarajevo*

Born: 1952. Bosnian poet who wrote about the Sarajevo Conflict. The poem captures the tragedy and aftermath of the Sarajevo Conflict in the 1990s. **Sarajevo Conflict:** A more recent conflict in the 1990s, centered around the city of Sarajevo in Bosnia and Herzegovina.

Key Themes in War Poetry:

Horror of War: Descriptions of the brutality and suffering experienced by soldiers.

Loss and Grief: Emotions surrounding the death of comrades and the impact on families.

Critique of War: Questioning the reasons for conflict and the effects on society

Can you link context to a specific moment in a text and help you understand the writer's intentions at this point?

- **Context of the author**

Shakespeare - born in 1564 (the **Elizabethan** era named after Elizabeth I) in Stratford-Upon-Avon and died in 1616.

James I became king after Elizabeth – **Jacobean** period (Jacob is the Latin for James).

Shakespeare worked as playwright, poet and actor.

• **Location:** Where was the book written or set? How does this affect what we can expect from the characters in terms of how they act the way they do and why?

• **Genre** Are there any techniques that are used in the story that are common in this particular style of novel?

• **Audience** How would an audience in this time/location react differently to us?

Title: Romeo and Juliet

Author: William Shakespeare

William Shakespeare was born in the **Elizabethan** era (named after Elizabeth I) in 1564 in Stratford-Upon-Avon, Warwickshire.

After Elizabeth I died, James I became king. This period of history is called the **Jacobean** era, because Jacob is the Latin for James. Shakespeare lived and worked as a playwright, poet and actor in both eras until his death in 1616.

Shakespeare's **tragedy**, *Romeo and Juliet*, was written relatively early in his career. He borrowed heavily from two texts: *The Tragical History of Romeo and Juliet* (1562) and *Palace of Pleasure* (1567).

During the Elizabethan era, society across Europe was deeply **religious** (predominantly Catholic or Protestant). The heavy religious presence is evident across several parts of *Romeo and Juliet*.

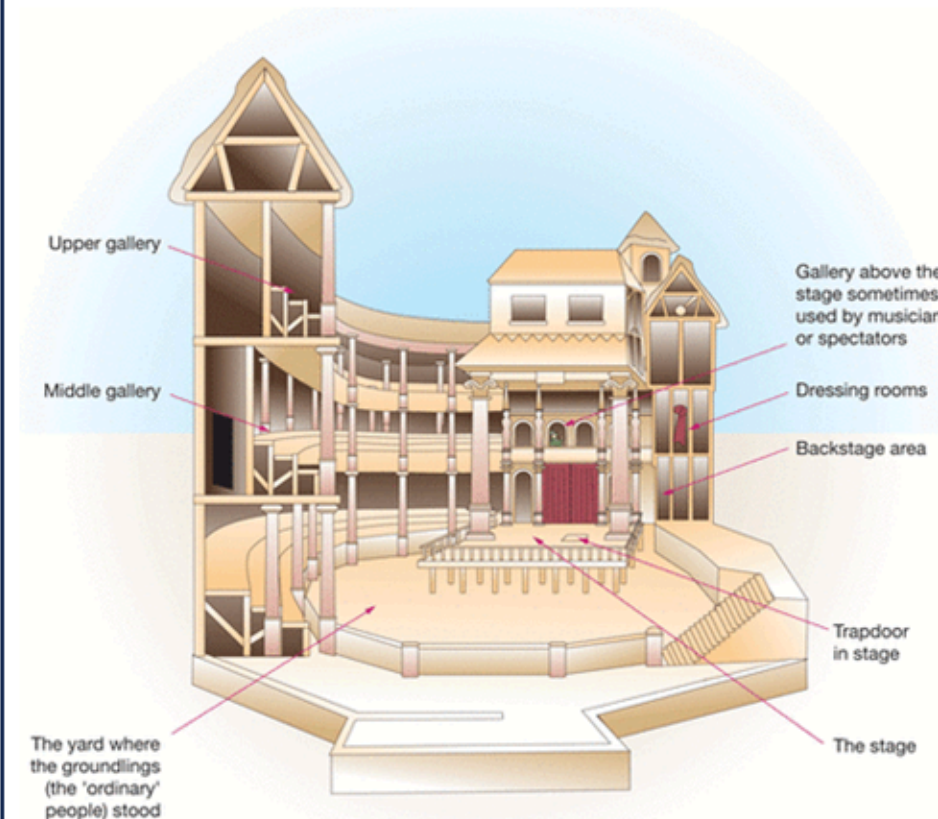
Romeo and Juliet is set in Verona, Italy. Verona was an Italian city-state during the Elizabethan era. A **city-state** is an area that is ruled by a major city. Italy wasn't one unified country, but a number of small independent city-states.

During the Elizabethan and Jacobean era, society in England, and across Europe, was **patriarchal** – women were considered inferior to men. Women belonged to their fathers (or brothers if their father had died) and then their husbands. Women were not permitted to own land or enter most professions. They were instead expected to bear children, be gentle and womanly.

Many Elizabethans believed God decided your fate, and that astrology could help you identify your course in life. They believed that your life was mapped out for you, or 'written in the stars'.

The Chamberlain's Men and The Globe theatre.

The large, open-air theatre, accommodated all people: the poor only had standing tickets on the ground floor (known as the '**groundlings**'). The rich sat in higher-level, covered galleries comfy seats – away from the poor.



Archaic Language (definition)

Thou = You (subj)

Thee = You (obj)

Thy = Your

Thine = Your

Hath = Has

Hast = Have

Ere = Before

Alas = Oh no!

Hence = Away

Wherefore = Why

Doth = does

Shakespearean insults:

"A most notable coward, an infinite and endless liar, an hourly promise breaker, the owner of no one good quality."

All's Well That Ends Well (Act 3, Scene 6)

"The rankest compound of villainous smell that ever offended nostril"

The Merry Wives of Windsor (Act 3, Scene 5)

"The tartness of his face sours ripe grapes."

The Comedy of Errors (Act 5, Scene 4)

"You scullion! You rampallian! You fustilarian! I'll tickle your catastrophe!"

Henry IV Part 2 (Act 2, Scene 1)

1.Key Terms	English Year 8 Reading	3. Big questions	4. Further reading
1. Protagonist: central character or hero who moves the story forward. 2. Genre: different types of writing which share similar features. 3. Culture: the customs, behaviours, celebrations and social institutions of a group of people. 4. Audience: the person or people who will be listening to or reading your text. 5. Purpose: the reason you are doing something. 6. Intent: what you are trying to achieve 7. Reveals: gives new information. 8. Demonstrates: gives an example of something that has already been mentioned. 9. Implies: suggests something – hints at something. 10. Evokes a feeling of: creates a feeling. 11. Suggests: an idea is put forward. 12. Monologue: a longer speech by a character to another character. 13. Soliloquy: a longer speech by a character to themselves or the audience. 14. Cyclical: happens in circles, reoccurs.	2. Response to reading	1. What questions did the opening make me want to find the answer to? 2. Do I like the main character? Why? 3. What does the writer want us to think about the main character? 4. Do any of the characters have a particular weakness or challenge to overcome? How do they do it? 5. Which character would be the best leader in a zombie apocalypse? 6. Which character would you want to be quarantined with? 7. If you could get transported into this story, would you? Why? 8. Which character would you let walk your dog? Why?	<i>The Boy in the striped Pyjamas</i> - John Boyne <i>Scythe Trilogy</i> - Neal Schusterman <i>The Poet X</i> - Elizabeth Acevedo <i>The Lie Tree</i> - Frances Hardinge <i>Hunger Games Trilogy</i> - Suzanne Collins <i>The Red Ribbon</i> - Lucy Adlington <i>Mortal Engines</i> - Phillip Reeve <i>The Enemy Series</i> - Charlie Higson <i>Bone Talk</i> - Candy Gourlay <i>The Graveyard Book</i> - Neil Gaiman <i>Things a bright girl can do</i> - Sally Nicholls <i>Chronicles of Narnia series</i> - CS Lewis <i>The Divergent Series</i> - Veronica Roth <i>Chaos Walking Series</i> - Patrick Ness <i>Percy Jackson Series</i> - Rick Riordan <i>The Smell of Other People's Houses</i> - Bonnie-Sue Hitchcock <i>School of Good and Evil series</i> - Soman Chainani <i>House with the Chicken Legs</i> - Sophie Anderson
	At this point in the play/story, I felt... I was forced to consider... Clearly, the writer wants us to think about... My initial prediction was that... As the play/story progressed, I began to question... Notably, when the character..., I.... I question the meaning behind the words "_____" as they could imply... ...because...	6. Structuring your essay	
	5. Super Spellings	1. Interpretation 2. Significant 3. Circumstances 4. Ultimately 5. Ambiguous 6. Alternative 7. Implicit 8. Consistent 9. Integral 10. Exploitation 11. Manipulation 12. Implications 13. Community 14. Enhanced 15. Resolution 16. Temporary	

1.Key Terms	English Year 8 Writing	3. Ways to make your writing more persuasive and engaging	4. PALL: planning for non-fiction writing
1. Etymology: the study of the history of words. 2. Register: how formal the language used is e.g. formal, neutral, informal. 3. Innovation: bringing about a new idea, method, product, process. 4. Target audience: The specific group of people that something is aimed at. 5. Protagonist: The main character in a plot. 6. Antagonist: Someone who opposes or is hostile towards the main character. 7. Figurative Language: Using a word or phrase outside of its every day meaning – usually to describe or compare something (e.g. similes, metaphors, personification). 8. Genre: different types of writing which share similar features. 9. Nuance: subtle or slight difference. 10. Perspective: a way of looking at something, a viewpoint. 11. Sensory: descriptions which relate to the five senses. 12. Rhetoric: persuasive language and style.	2. Useful Sentence Starters 1. Adverbials. E.g. Forcefully, the... 2. -ed words. E.g. Focused, challenged 3. -ing verbs. E.g. Vaulting, sprinting... 4. Simile starts. e.g. Like an uncoiled spring, the ... 5. Prepositions. E.g. Above the door... 6. List of adjectives. E.g. Strong, powerful, majestic... 7. Comparisons. E.g. Unlike the armoured opponent, the... 8. A noun to start. e.g. Quests are often... 9. When... 10. As ... 11. Although ... 5. Mood words. Can you write a paragraph to demonstrate each one? 1. Intriguing 2. Anticipatory 3. Tense 4. Exhilarating 5. Frantic 6. Exhilarating 7. Chaotic 8. Suspicious 9. Foreboding 10. Ominous 11. Mysterious 12. Whimsical 13. Awe-inspiring 14. Idyllic 15. Playful 16. Hopeful 17. Sombre 18. Energetic 19. Dreamy 20. Aggressive	Anecdote E.g. <i>That reminds me of a time when I...</i> Alliteration E.g. <i>Powerful, prancing penguins.</i> Pronouns E.g. <i>I, you, he, she, we</i> Facts E.g. <i>Completing puzzles helps your memory.</i> Opinions E.g. <i>Xbox is the best games console.</i> Rhetorical Questions E.g. <i>How would you feel if...?</i> Repetition E.g. <i>Monopoly is fun, fun fun!</i> Emotive Language e.g. <i>I was isolated and alone.</i> Exaggeration e.g. <i>Gaming is taking over the world.</i> Statistics e.g. <i>89% of people have played a computer game.</i> Threes e.g. <i>Playing games is exciting, challenging and rewarding.</i> Vary sentences for pace Sensory language 6. Super Spellings 1. Virtually 2. Persistent 3. Sinister 4. Dominant 5. Participation 6. Aspiration 7. Valiantly 8. Eliminate 9. Response 10. Generated 11. Energy 12. Victorious 13. Promote 14. Succeed 15. Effervescent 16. Illuminating 17. Consequences 18. Strategy 19. Innovation 20. Enterprising	Example: Speech: Call To Action or Enterprise project Purpose: To persuade the audience to invest in your product. Audience: A panel of industry experts looking to invest in a new product Language: Persuasive, informative and engaging. Layout – 6 paragraphs including: Introduction Unique selling point? Packaging? How it appeals to the target audience? How it fills a gap in the market? Advert Conclusion What is the PALL for your writing? 7. SPaG: complete these Apostrophes are used for... Ellipsis is used to... An exclamation mark shows ... Commas are used to... Brackets can... A semi colon is used to...

1. Short Stories and Novels

- | | |
|------------------|----------------------|
| 1. allusion | 13. motif |
| 2. antagonist | 14. narrator |
| 3. character | 15. pathetic fallacy |
| 4. climax | 16. plot |
| 5. conflict | 17. prose |
| 6. development | 18. protagonist |
| 7. exposition | 19. resolution |
| 8. foreshadowing | 20. second person |
| 9. first person | 21. setting |
| 10. hook | 22. tension |
| 11. implicit | 23. theme |
| 12. irony | 24. third person |



3. Poetry

- | | |
|-----------------------|----------------------|
| 1. anadiplosis | 13. onomatopoeia |
| 2. anaphora | 14. personification |
| 3. caesura | 15. rhyme |
| 4. dramatic monologue | 16. rhythm |
| 5. end stop | 17. rhyming couplets |
| 6. enjambment | 18. sibilance |
| 7. alliteration | 19. simile |
| 8. free verse | 20. sonnet |
| 9. half rhyme | 21. stanza |
| 10. metaphor | 22. volta |
| 11. meter | |
| 12. ode | |



2. Plays

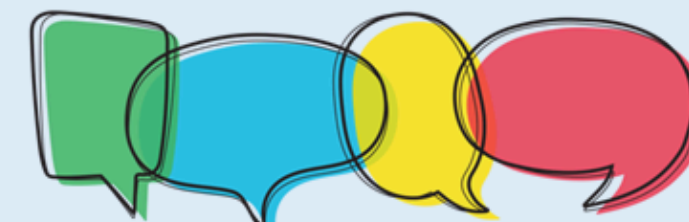
- | | |
|-------------------|-----------------------|
| 1. act | 11. scene |
| 2. audience | 12. script |
| 3. cast | 13. situational irony |
| 4. comedy | 14. soliloquy |
| 5. dialogue | 15. stage directions |
| 6. director | 16. staging |
| 7. dramatic irony | 17. tragedy |
| 8. monologue | 18. romance |
| 9. playwright | |
| 10. protagonist | |



English Knowledge Organiser Glossary

4. Persuasive writing

- | | |
|-------------------------|--------------------|
| 1. alliteration | 12. ethos |
| 2. anecdote | 13. expert opinion |
| 3. pronouns | 14. flattery |
| 4. facts | 15. humour |
| 5. opinions | 16. imperatives |
| 6. rhetorical questions | 17. logos |
| 7. repetition | 18. pathos |
| 8. exaggeration | 19. sarcasm |
| 9. emotive language | 20. rhetoric |
| 10. statistics | |
| 11. three | |





Year 8

Food Technology

Work hard. Be kind. Belong.

PROTEIN – Growth and repair of cells (Meat, beans, fish, dairy)

CARBOHYDRATE – Energy – Sugar and Starch (Starch – bread, pasta, rice. Sugar – sweets, fizzy drinks)

FAT – Insulation, energy (Saturated – animals - butter. Unsaturated – vegetables – oils)

VITAMINS AND MINERALS – Do a wide range of jobs in the body (A wide range of foods)

FIBRE – Aids digestion (Brown pasta, rice, fruit and vegetables)

HOMEMADE V FAST FOODS

Homemade - positives

Know what's in it
Lower fat, sugar and salt
No artificial additives
Choose own ingredients – know their food provenance
Energy used in making

Fast food - negatives

Often high in sugar, fat and salt
Artificial additives
Not fresh
Throw away utensils etc



Cuisine – The style of cooking for a particular country or region

Traditional – Foods that are passed through generations and are consumed over a long period of time

Traditional British Foods

WALES – Bara Brith

SCOTLAND – Haggis

IRELAND – Soda Bread

ENGLAND – Bakewell Tart



Scones - related to the ancient Welsh tradition of cooking small round yeast cakes on stones, that later changed to griddles. Today's scones are baked in the oven.
Cornwall – jam then cream
Devon – cream then jam



Cornish Pasties – A Cornish food eaten by poorer working families who could only afford cheap ingredients such as potatoes, swede and onion. Meat was added later. The D-shape enabled tin miners to re-heat them underground as well as eat them safely. The crust was used as a handle which was then discarded due to the high levels of arsenic in many of the tin mines.

Great British Breakfast - The full breakfast became popular in the British Isles during the Victorian era is a breakfast meal, usually including bacon, sausages, eggs, and a variety of other cooked foods

BMR – Basal Metabolic Rate – The energy your body needs whilst it is at rest – heart beating etc

PAL – Physical Activity Level – The extra energy needed for how active you are

All food provides energy. Fat and Sugar provide LOTS of energy

BMI – Body Mass Index – Height, weight, sex and age is used to give a number to indicate whether you are over/ under weight

OBESITY – BMI is over 30

BALANCE: INPUT V OUTPUT

Food Waste

There are 2 main reasons that we waste food in the home.

1. We prepare too much food
 2. We don't use the food before it goes off
- You could also use left over food to make another dish:

Bread for breadcrumbs
Potatoes in a frittata
Chicken in a curry

Food Security

Food security, means that all people, at all times, have the ability to buy enough safe, nutritious and affordable high-quality food to meet their needs for an active and healthy life

Shortening – When fat is rubbed into flour with the fingertips. The fat coats the flour preventing bonds from forming. This results in a product with a crumbly texture. (Scones and Pasties)

Methods of Heat transfer

Conduction Heat is transferred through contact - HOB

Convection Heat is transferred through air flow – hot air rises, cold air sinks – OVEN. **This can also happen in a liquid on the hob!**

Radiation Heat is transferred as it radiates onto the food – GRILL & MICROWAVE

Radiation-Conduction-Convection



BRITISH CUISINE



Glazing – Brushing the top of a product with egg or milk to give it a golden shine

Pane – Flour, egg, breadcrumbs – coating a food

Macronutrients are the nutrients we need in larger quantities: **fat, protein and carbohydrate**.

Micronutrients are **vitamins and minerals**. These are **equally important but can be consumed in smaller amounts**.

M

A non-nutrient is something that has **no calorific value** but **plays an important role within the overall health** of the body. Fibre and Water

Curry

We could improve the nutrition of a curry by

- Adding vegetables to the sauce
- Making a homemade sauce
- Making our curries vegetarian
- Using lean meat
- Using a low-fat cream or replacing it with a yoghurt
- Serving with brown rice
- Using an oil to fry rather than butter

N

Naan bread

Garlic, Coriander, Peshwari, Plain Keema

Naan bread is often served with butter or Ghee on the top – these are **saturated animal fats**

O

Food from other countries

France – Pain au chocolat, croque monsieur, snails

Italy – pizza, pasta, ciabatta, risotto

Spain - Paella

Greece – Greek salad

China – Stirfry, chicken chow mein, prawn crackers

Japan - Sushi

P

Why is food different in other countries?

- Lifestyle, income, time available to prepare and cook
- Cost of food
- Time of day and eating habits
- Food availability and seasonality – climate
- Enjoyment, celebrations, preferences and social aspects of food
- Ethics/ moral beliefs/ religion
- Nutrition
- Culture/ tradition

Q

India – Naan bread, curry, mango chutney, raita, poppadoms, lime pickle

Curry – There are many different types of curry available varying in 'hotness'

S



Most Indian dishes are vegetarian. Hindus don't eat beef (Cows are sacred in their religion) Muslims don't eat pork (Pigs are dirty). India dishes use a lot of spices as these are grown in hot climates like India



INTERNATIONAL CUISINE

Religion	Beliefs	Can not eat
Buddhism	Think about eating in 5 ways. What food is, why we eat, where food comes from, when it should be eaten, how it should be eaten	Meat and dairy products, alcohol
Christianity	Food and drink is part of Gods creation	No restrictions
Hinduism	Food has energies that people take in when eating	Beef –sacred
Islam	Laws are found in the Qu'ran	Pork, alcohol
Judaism	Food has to be 'kosher' e.g. animals that chew the cud - cows	Pork, Shellfish,
Rastafarianism	Food must be natural and clean	Pork, fish no longer than 30cm
Sikhism	Vegetarians	No meat, tea, coffee or alcohol

R

Tandoori ovens – these are clay ovens that are set into the ground. Naan breads are stuck to the side to cook in the heat from the fire below

T

Taste buds

U



The tongue map shows areas which are more sensitive to a particular taste, not the areas which exclusively recognize a taste.

We can still taste bitterness on the tip of our tongue; however, we are more sensitive to it at the back of the tongue. Likewise, we can taste sweetness on the back as well as the front but are more sensitive to sweetness at the front

Herbs & Spices

Herb = Generally the leaf of the plant. Bay leaf, Parsley, Sage, Rosemary

Spice = Any other part of the plant – (bark, seeds, root) Cumin, Nutmeg, Cinnamon, Ginger



V



THS

TIVERTON HIGH SCHOOL

Year 8
French

Work hard. Be kind. Belong.

Pronunciation.

L'alphabet.

A = ah	B = bay	C = say	D = day
E = euh	F = eff	G = jay	H = ash
I = ee	J = jee	K = ka	L = el
M = em	N = en	O = oh	P = pay
Q = coo	R = air	S = ess	T = tay
U = ooh	V = vay	W dooble vay	X = eeks
Y = ee grek	Z = zed		

Pronunciation rules

Don't pronounce the last letter of a word UNLESS it is CRF or L
(so don't pronounce a, s/t/z or p)
Remember be CAREFUL to NOT say the last consonant.
An H at the start of a word is silent

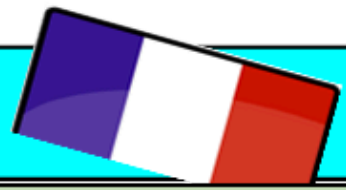
Phonics sounds

see	say
o	oh
au	oh
eau	oh
u	oooh
oi	wa
ch	sh
i	ee
er	ay
é	ay
ez	ay
qu	k
eu	eurgh

Vocabulary.

Les numéros

0 zero	1 un	2 deux	3 trois	4 quatre
5 cinq	6 six	7 sept	8 huit	9 neuf
10 dix	11 onze	12 douze	13 treize	14 quatorze
15 quinze	16 seize	17 dix-sept	18 dix-uit	19 dix-neuf
20 vingt	21 vingt-et-un	22 vingt-deux	23 vingt-trois	24 vingt-quatre
25 vingt-cinq	26 vingt-six	27 vingt-sept	28 vingt-huit	29 vingt-neuf
30 trente	31 trente-et-un			



Vocabulary

Les opinions - opinions

français

anglais

Je préfère

I prefer

J'adore

I love

Je n'aime pas

I do not like

Je déteste

I hate

Grammar

Important verbs (present tense)

Je
I

Tu
you

Il/elle/on
He/she/ one

Nous
We

Vous
You

Ils/elles
They

Avoir
To have

J'ai
I have

Tu as
You have

Il/ elle/ on a
He/she/one
has

Nous
avons
We have

Vous avez
You have

Ils/ elles
ont
They have

Être
To be

Je suis
I am

Tu es
You are

Il/elle/on est
He/she/one is

Nous
sommes
We are

Vous êtes
You are

Ils/elles
sont
They are

Les couleurs- the colours

Adjective agreement rules

If the masculine for the
adjective ends like this

Make it feminine like
this

Ends in a **consonant**
(eg. t or d)

Add an **e**

Ends in an **e** or an **a**
Don't change it

Ends in **eux**

Change it for **euse**

Ends in **if**

Change it to **ive**

noir

rouge

jaune

vert

bleu

rose

violet

blanc

marron

orange

gris

multicolore



Vocabulary

Grammar

Week 1: les fêtes

Week? [resent tense verbs

Week ? Adverbs of time & frequency

Ma fête préférée est...	My favourite festival is
Le jour de l'An	New years day
La fête des rois/ L'Epiphane	Twelfth night/ Epiphany
La Chandeleur	Candlemas
La saint-valentin	Valentine's day
Mardi Gras	Shrove Tuesday
Le 1er avril	April fool's day
Pâques	Easter
La fête du travail	May day
La fête de mères	Mother's day
La fête nationale	Bastille day
La Toussaint	All saints day
Le jour de Noël	Christmas day
La Saint Sylvestre	New years eve

Nous mangeons: we eat
On mange: we eat
Nous regardons: we watch
On regarde: we watch
Nous dansons: we dance
On danse: we dance
On s'amuse: we have fun
Nous nous amusons: we have fun
On décore: we decorate
Nous décorons: we decorate
On donne: we give
Nous donnons: we give
On bois: we drink
Nous buvons: we drink

aujourd'hui: today
le matin: in the morning
l'après-midi: in the afternoon
le soir: in the evening
beaucoup de: a lot of
D'habitude typically
De temps en temps: from time to time
Parfois- sometimes
Tous les ans: every year

Préférer- to prefer

Adorer- to love

Aimer- to like

Détester- to hate

Je préfère- I prefer	J'adore- I love	J'aime- I like	Je déteste- I hate
Il/elle/on préfère= he/she/we prefer	Il/elle/on adore- he/she/ we love	Il/elle/on aime- He/she/we like	Il/elle/on déteste- He/she/we hate



Vocabulary

De la nourriture- food

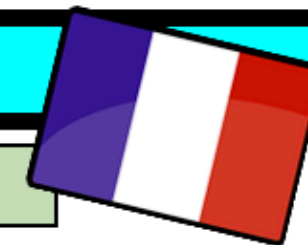
Masculine	feminine	plural
Du chocolat- some chocolate	De la salade- some salad	Des crêpes- some pancakes
Du fromage-some cheese	De la viande- some meat	Des oeufs (au chocolat)-some (Chocolate) eggs
Du miel- some honey	De la pomme- some apple	Des fruits- some fruit
Du pain – some bread	De la banane- some banana	Des légumes- some vegetables
Du poisson- some fish	De la pêche- some peach	Des hamburgers- some hamburgers
Du poulet rôti- some roast chicken	De la galette des rois- some kings cake	Des langoustines- some prawns
Du dinde rôti- some roast turkey	De la bûche de Noël- some yule log	Des huitres- some oysters
Du riz- some rice		Des saucisses- some sausages
Du boeuf- some beef		Des pommes de terres- some potatoes
De l'agneau- some lamb		Des carottes- some arrots
Du porc- some pork		Des petits pois- some peas
Du gâteau (d'anniversaire)- some birthday cake		
Du saumon fume- some smoked salmon		

Les repas- meals

français	anglais
Le petit déjeuner	Breakfast
Le goûter	Snack
Le déjeuner	lunch
Le dîner	dinner

Les boissons- drinks

Masculine	feminine
du Lait- some milk	de la lemonade Some lemondade
du Café- some coffee	
du thé- some tea	
du coca- some cola	
de l'eau- some water	
du jus – some juice	
du vin –some wine	



Vocabulary

Adjectives

français	anglais
dégoûtant	Disgusting
délicieux	Delicious
dur	Tough
Épicé	Spicy
gras	Greasy
malsain	Unhealthy
refraichissant	Refreshing
sain	Healthy
savoureux	tasty
aigre	sour
amer	bitter
fade	bland
jutueux	juicy
sucré	sweet
léger	light

Grammar

Modal verbs

Pouvoir- to be able to	Devoir- to have to	vouloir- to want to
Je peux- I am able to (can) Il/elle/on peut he/she/we are able to/can	Je dois- I have to (must) Il/elle/on doit- he/she/ we have to (must)	Je veux= I want Il/elle/on veut-He/she/we want

Comparatives

français	anglais
Plus...que	More...than
Moins...que	Less..than
Aussi...que	As...as

Direct object pronouns (it/them)

Masculine	Le / l'	Je le mange –I eat it je l'adore- I love it
Feminine	La / l'	Je la bois- I drink it Je l'aime-I like it
Plural	Les	Je les prends-I take them Je les aime- I like them

Present tense

manger- to eat	Goûter= to taste	boire- to drink	prendre- to take
Je mange – I eat Il/elle/on mange- He/she/we eat	Je goûte – I taste Il/elle/on goûte- He/she/we taste	Je bois – I drink Il/elle/on boit- He/she/we drink	Je prends – I take/ have Il/elle/on prend He/she/we takes/has



Vocabulary

Les cadeaux- presents

Masculine		feminine		plural	
Un bracelet	A bracelet	Une trotinette	A scooter	Des rollers	Some roller boots
Un livre	a book	Une console de jeux	A games console	Des jeux vidéos	Some video games
Un portable	A mobile phone	Une poupée	A doll		
Un robot	A robot	Une montre	A watch		
Un ordinateur	A computer	Une peluche	A teddy bear		
Du parfum	Some perfume				
Du maquillage	Some make-up				
De l'argent	Some money				

Present tense

donner- to give	recevoir= to receive
Je donne – I give Tu donnes- you give Il/elle/on donne- He/she/we give Nous donnons- we give Vous donnez- you give Ils/elles donnent-they give	Je reçois – I receive Tu reçois- you receive Il/elle/on reçoit- He/she/we receive Nous recevons- we receive Vous recevez- we receive Ils/elles reçoivent- they receive

Les lieux- venues

français	anglais
À l'église	At church
À la mosquée	At the mosque
Au restaurant	At the restaurant
Chez moi	At my house
Chez mes proches	At my relatives house



Year 8
Geography

Work hard. Be kind. Belong.

GEOGRAPHY 8.1. COASTS

The British Isles—major coastal locations



Key:

1. London
2. Felixstowe
3. Southampton
4. Brixham
5. Plymouth
6. Newquay
7. Bristol
8. Cardiff
9. Swansea
10. Milford Haven
11. Liverpool
12. Glasgow
13. Aberdeen
14. Edinburgh
15. Newcastle
16. Grimsby
17. Dublin
18. Belfast

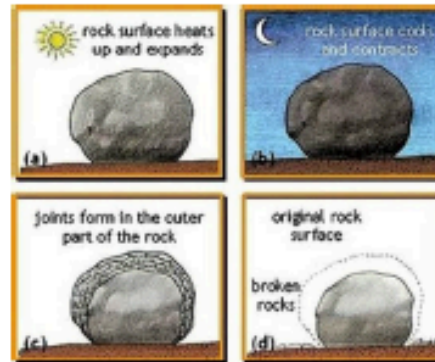
Coasts Key terms

weathering	biological	chemical
freeze-thaw	exfoliation	erosion
hydraulic action	abrasion	attrition
solution	headland	bay
cliff	headland	cave
stack	stump	Wave-cut notch
wave-cut platform	longshore drift	spit
bar	tombolo	defences
soft engineering	groynes	recurved sea wall
rock armour	beach replenishment	
managed retreat	dune regeneration	

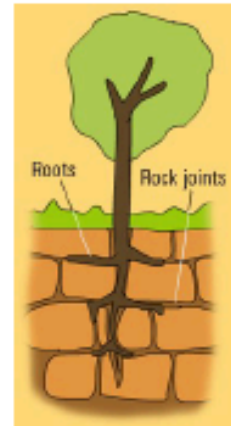
2. Weathering processes

Weathering is the weakening of exposed rocks by the atmosphere (temperature and water) or by living organisms such as plants and burrowing animals. Erosion follows weathering at exposed locations such as the coast and mountains.

Mechanical: exfoliation



Biological weathering



Chemical weathering



Mechanical: Freeze-thaw weathering

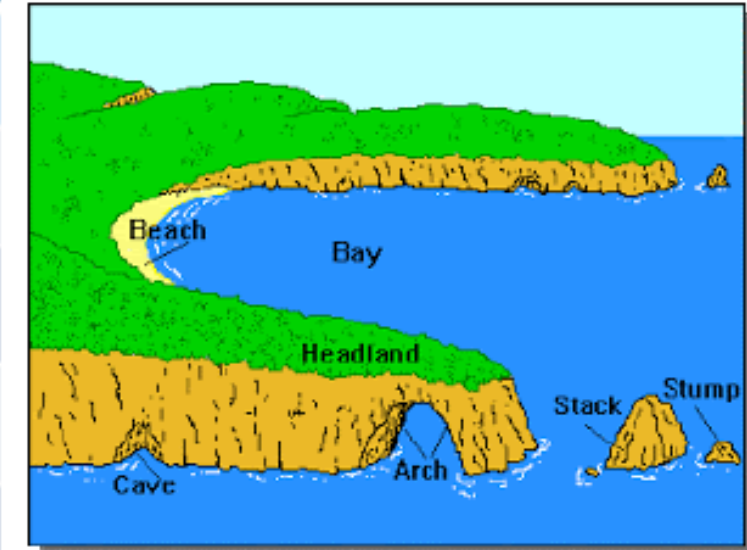


3. Coastal Erosion Processes

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

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

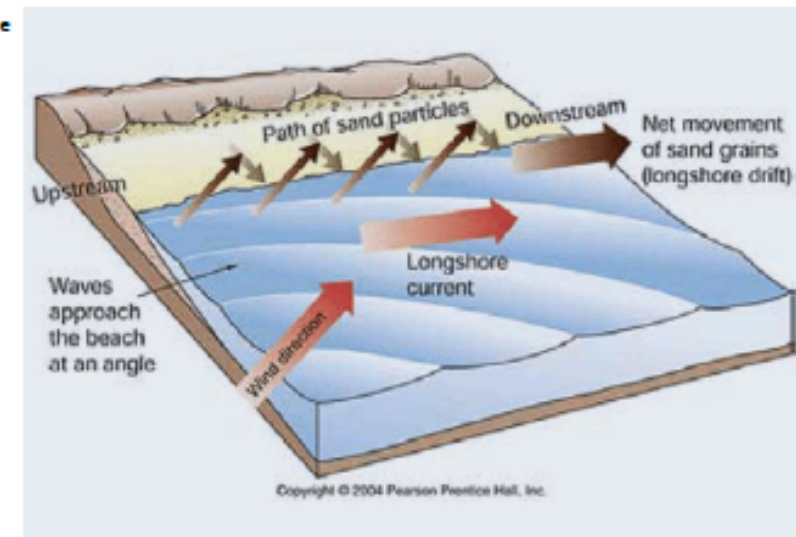
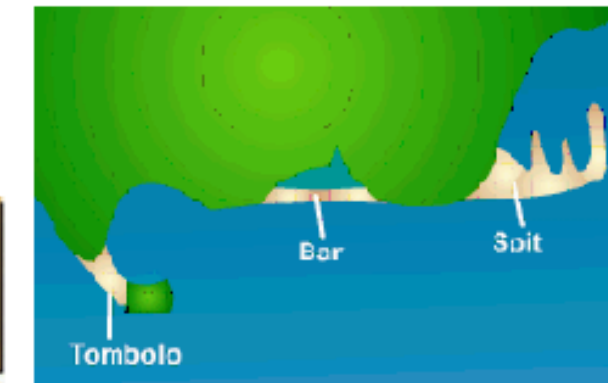
3. Coastal Erosion features



4. Longshore Drift (LSD) - a transportation process

5. Coastal Deposition features

Deposition features are made at the coast when material (like sand, shingle and pebbles) are put down on the sea bed or beach when transportation energy gets low. Spits often extend out across river mouths, bars connect two headlands and tombolos connect an island to the mainland.



1. Factors involved in making waves:

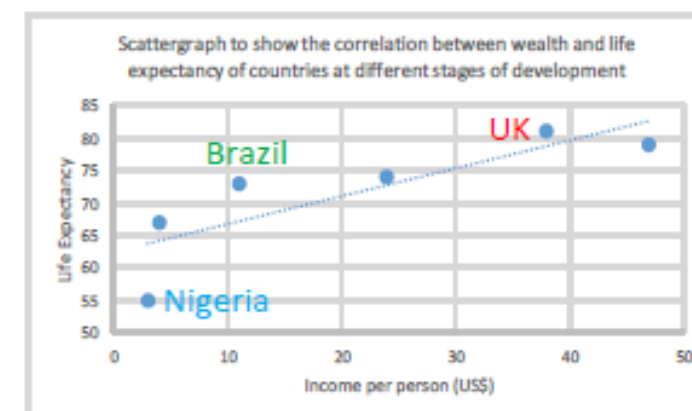
Fetch The amount of open water available for the wind to blow over. Bigger fetch leads to better potential for waves.	Wind Strength The stronger the wind, the greater the potential for waves to form.
Wind direction Consistent wind direction can build a swell of waves lasting many days.	Wind duration The longer the length of time the wind blows for, the more waves can be made.

6. Coastal Defences: Hard and Soft Engineering to protect the coast

Hard Engineering	Recurved Sea wall Curved reinforced concrete wall with a distinct curved face to redirect wave energy out to sea	Groynes Wooden walls built at right-angles to the shore to trap sand and hold the beach in place	Rock Armour Granite boulders piled up to break up the force of incoming waves
Soft Engineering	Dune regeneration Replant sand dunes with Marram grass to bind the soft, sandy soil together to stabilise the dunes	Dune fencing Fences placed in dunes to encourage more sand to be trapped to stabilise the dunes—and keep tourists off!	Beach replenishment Dredged sand from offshore is pumped back onto the beach to make the waves break sooner.

GEOGRAPHY 8.4. DEVELOPMENT

1. The concept of development



Development is like a race for progress. However, there was no clear start to the race and there is no ending—as new progress will always be made. So some countries, like the **UK** and France, were the front-runners back in the 1800s and remain one of the world's most developed countries today—called **HICs**. However, some countries have only recently started making progress (or had problems holding them back) such as **Nigeria** in Asia; these are **LICs**. Some countries started to develop later but are making rapid progress—such as China, India and **Brazil**; these countries are **NEEs**. The scattergraph to the left shows the different levels of development.

2. & 3. Measuring Development and Key Terms

Development	The geographical concept and process of making economic and social progress
Standard of Living (GNI per Capita)	Average income per person. The Gross National Income is the money generated by a country. 'Per Capita' means per head of population. So GNI per Capita is the statistical average income.
Quality of Life	A measure of how contented people are with life. Happiness is subjective (an opinion) so this can only be measured by a range of other factors that influence peoples' opinions about their lives.
Social measure	A statistic to measure the conditions of life for people NOT to do with income or money. So, life expectancy, access to water (%), daily calorie intake or fertility rate would all be examples.
Economic measure	A statistic to measure the financial (money) state people in a country are in—most commonly, the average income per person, per year.
HDI (Human Development Index)	The HDI value is a 'socioeconomic' statistic created by combining 3 other statistics together (average: income, life expectancy and years of schooling) and putting the world's countries in rank order from top to bottom.
HIC	High Income Country—such as the UK —which has high average income
LIC	Low Income Country—such as Kenya—which has a low average income
NEE	Newly Emerging Economies. Countries making rapid economic progress—like China
Birth/Death rate	The number of births/deaths per 1000 of population in a country per year. Countries with high birth rates and low death rates will have a rapidly increasing population
Infant Mortality	The number of infants who are born alive but die before they are one year of age. The higher this value, the harder life is in the country.
Employment Structure	The types of jobs people do from primary, secondary, tertiary and quaternary.
Life expectancy	The average number of years a person is likely to live in a given country.
Literacy rate	The percentage of a population who can read and write. More recently, this measure is moving to 'average number of years of schooling'.
Doctor/Patient ratio	The number of patients per doctor in a country. As a rule, the higher the number of patients, the worse the healthcare system is.

A. Choropleth map of countries above or below average global income



A. Global income global average per person was \$10700 in 2010. The orange countries are below this value, the blue are above. Does this represent the full reality though? (X is India and Y is USA).

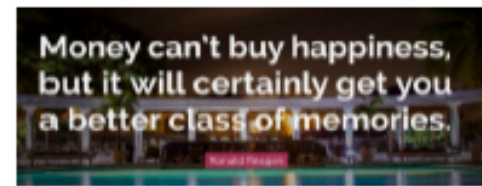
B. Cartogram of poor access to sanitation



B. This cartogram is a 'distorted' map which changes the size of the countries to demonstrate the data value of the title. Country X is India—a NEE. Clearly, many citizens do not have access to toilets or safe water for hygiene. This is shown by the size of the country swelling up. Country Y is USA—a HIC. On the map it has shrunk almost completely, which tells us the people virtually all have access toilets and safe water supplies for hygiene. Therefore all 'developed' countries have shrunk too

5. Economic measures vs 6. Social measures

Standard of Living	Quality of Life
A quantifiable (objective) measure	A non-quantifiable (subjective) measure
A measure of wealth (income)	A measure of contentedness or wellbeing
A measure of material comforts available to people or a community	Varies according to preference and experience
A measure of possessions and material good you might own	A measurement of mental health and life expectations

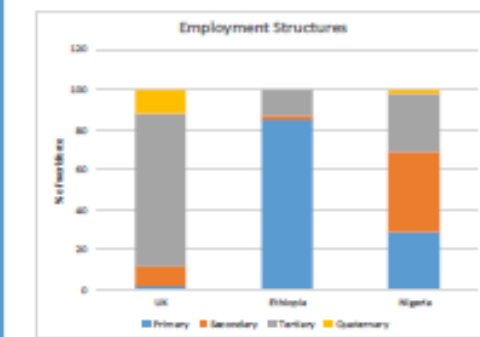


Money can buy a house, but not a home.
Money can buy a bed, but not sleep.
Money can buy a clock, but not time.
Money can buy a book, but not knowledge.
Money can buy food, but not an appetite.
Money can buy you friends but not love.

SoL or QoL?



4. Employment structures



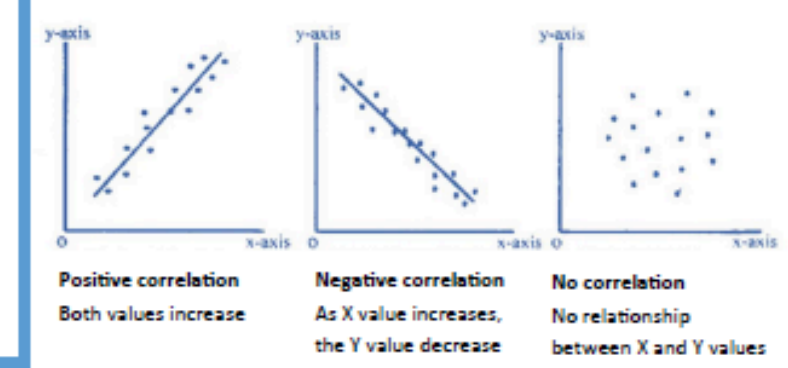
You can tell a lot about a country by knowing what people do for employment. The larger the primary sector is (jobs in farming for example), the less developed the country is. Countries with a large secondary sector (manufacturing) are often NEEs. Countries with big tertiary sectors (the service industry) are generally the HICs; these countries often have a growing quaternary sector too. Jobs in the quaternary sector provide services for other businesses—such as research and development and IT support.

Statistical Analysis Core skills

Mode	The number which appears the most often in a set of numbers (data)
Bi-modal	If there are two modes
Median	The number in the middle of the set when the numbers are put in ascending order
Range	Find the largest and smallest numbers in the set and subtract them
Mean	Add up the numbers and divide by how many there are in the set
Scatter graph	Used to show a relationship between two variables. For example, the average income and life expectancy in a range of countries
Anomaly (Anomalies)	A piece of data that doesn't fit with the pattern shown by the rest of the data. Plural is 'anomalies'
Line of best fit (trend line)	Goes through the directional spread of the data. Has 50% of the plots on either side. Doesn't have to go through the origin (where X and Y axis cross).

Scatter graph correlations

Correlation means a relationship between two sets of variables. For example, a positive correlation could be the harder you try at school, the better your grades will be!





THS

TIVERTON HIGH SCHOOL

Year 8

History

Work hard. Be kind. Belong.

History Year 8 Knowledge Organiser: Autumn Term

1. Causes of the English Civil War: **Money:** Charles wanted money but needed Parliament to agree any laws to raise taxes. In 1635 he ordered everyone to pay Ship Money without their permission. **Power:** Charles believed in The Divine Right of Kings. In 1629 he banned Parliament for eleven years. In 1635 an MP called John Hampden was arrested for refusing to pay taxes. **Religion:** Charles marries a Spanish Catholic called Henrietta Maria. In 1639 Scottish Puritans attacked England.

2. English Civil War

The armies fought with musketeers, pikemen and cavalry. Parliament's army started badly at the Battle of Edgehil (1642), but soon made improvements and gained ground. By the Battle of Naseby (1645), the King's army was overwhelmed and Parliament won. There were 4 years when the King was imprisoned, escaped, and when discussions were held to try to resolve their differences...but it all ended with the King being put on trial and then executed in 1649. This was a VERY SIGNIFICANT EVENT in British History.

To people living in England at the time, it felt as if the "World had been Turned Upside Down" (Google "World Turned Upside Down English Civil War" Images. What can you see? 😊)

The country was then run by **Oliver Cromwell**, one of the Parliamentary leaders, until he died in 1658, then Parliament ended up asking Charles I's son to come back and be the king - King Charles II - in 1660. We call this the **RESTORATION**.

3. Growth of the British Empire

1492: Columbus sets sail **1496:** Official start of the British Empire
1497: John Cabot claimed Newfoundland **1559:** Elizabeth sends more voyages
1577: Francis Drake claims Western coast of America
1583: Francis Gilbert sets up a colony in Newfoundland
1584: Walter Raleigh creates Virginia **1587:** First English child born in America

4. How Britain became involved in the slave trade:

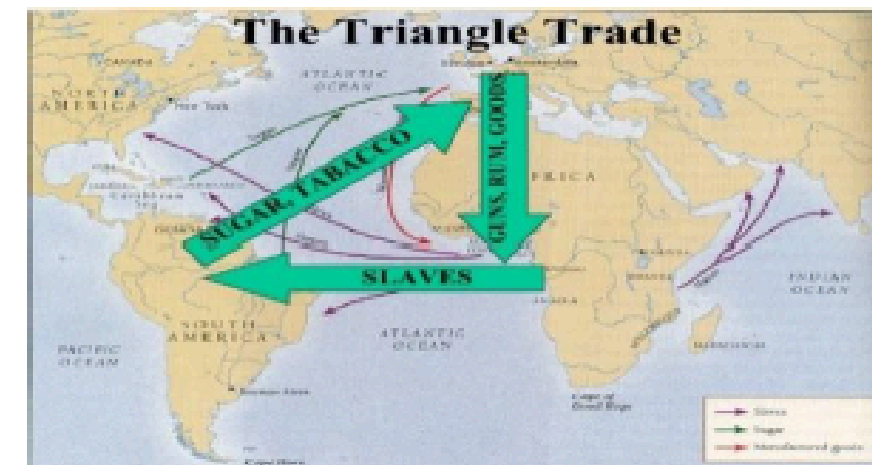
Tudor period: 20,000 free Black people lived in England

1530s: English traders started to go to West Africa where Portuguese merchants had been trading.

1562: John Hawkins led a voyage to capture and enslave African people. Britain's involvement in the Trans-Atlantic Slave Trade began.

1627: English settlers started to farm sugar for profit in Barbados. Demand grew so they enslaved Africans to work on the sugar plantations.

5. The Transatlantic Slave Trade



Trans-Atlantic Slave Trade: 10 million Africans transported to the Americas.

Middle Passage: the journey from Africa to the Americas

Plantation: A huge farm growing one type of crop

6. Slave Resistance

Nanny of the Maroons led enslaved Africans to fight back against the British Army. **Passive resistance** was a way for enslaved people to stand up to their owners through not working. **Keeping African traditions** alive was another way to stand up to plantation owners. **Uprisings** occurred on many plantations. In 1804 Haiti was founded after 500,000 enslaved people revolted and took control of the island. **The Underground Railroad** was run by abolitionists who helped enslaved people to escape to free states, Canada and Nova Scotia.

History Year 8 Knowledge Organiser: Spring Term

1) Enslaved African resistance

Mary Prince: published her book of experiences in 1831

Olaudah Equiano: bought his freedom and wrote a narrative of his life as an enslaved African in 1789

Toussaint L'Ouverture: led a successful revolt of enslaved Africans and emancipated enslaved Africans in Haiti

Nanny of the Maroons: organised successful plans to free over 1000 enslaved Africans in Jamaica and led a community of formerly enslaved Africans called the Windward Maroons.

2) Abolition of the slave trade

William Wilberforce: leading abolitionist.

1807: Trading of enslaved Africans banned.

1833: Enslaved Africans freed across the British Empire



3) Industrial Revolution 1750-1900 (A time of great change for Britain)

Enlightenment: natural thinking taking a lead over religious thinking

Agricultural Revolution: a complete change in farming methods

Scientific Revolution: a complete change in scientific thought

Cottage Industry: manufacturing done on a small scale in people's homes

Industrial Revolution: a complete change from farming and domestic manufacturing to use of factories

Factors that caused the Industrial Revolution and led to the cycle of prosperity

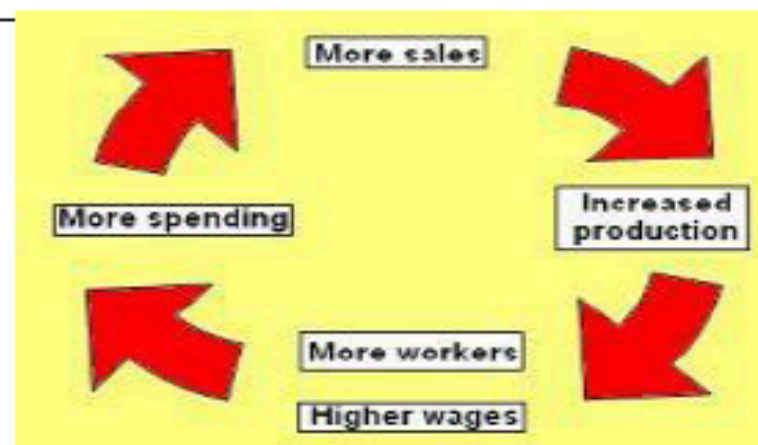
Coal

Enclosures

Increasing population

Great individuals

Profits and products from slave trade



4) Agricultural Revolution

Jethro Tull: Invented the seed drill (1700)

	1750	1900
Population	 7 million	 37 million
People living in towns	 13%	 87%
Life Expectancy	 Men 31 Women 33	 Men 45 Women 48
Deaths at birth	 Deaths at birth 65% Babies lived 35%	 Deaths at birth 15% Babies lived 85%

Population growth in Britain

1750: Population of 7 million. 80% live in the countryside

1850: Population of 16 million. 80% live in towns and cities

Key term: **Industrialisation.**
The development of industries across a country on a wide scale

5) Key people of the Industrial Revolution

Richard Arkwright: Invented the water frame (1769)

Robert Boyle: first modern chemist

John Heathcoat: English inventor from Derbyshire, invented a machine that made lace, moved his successful business to Tiverton.

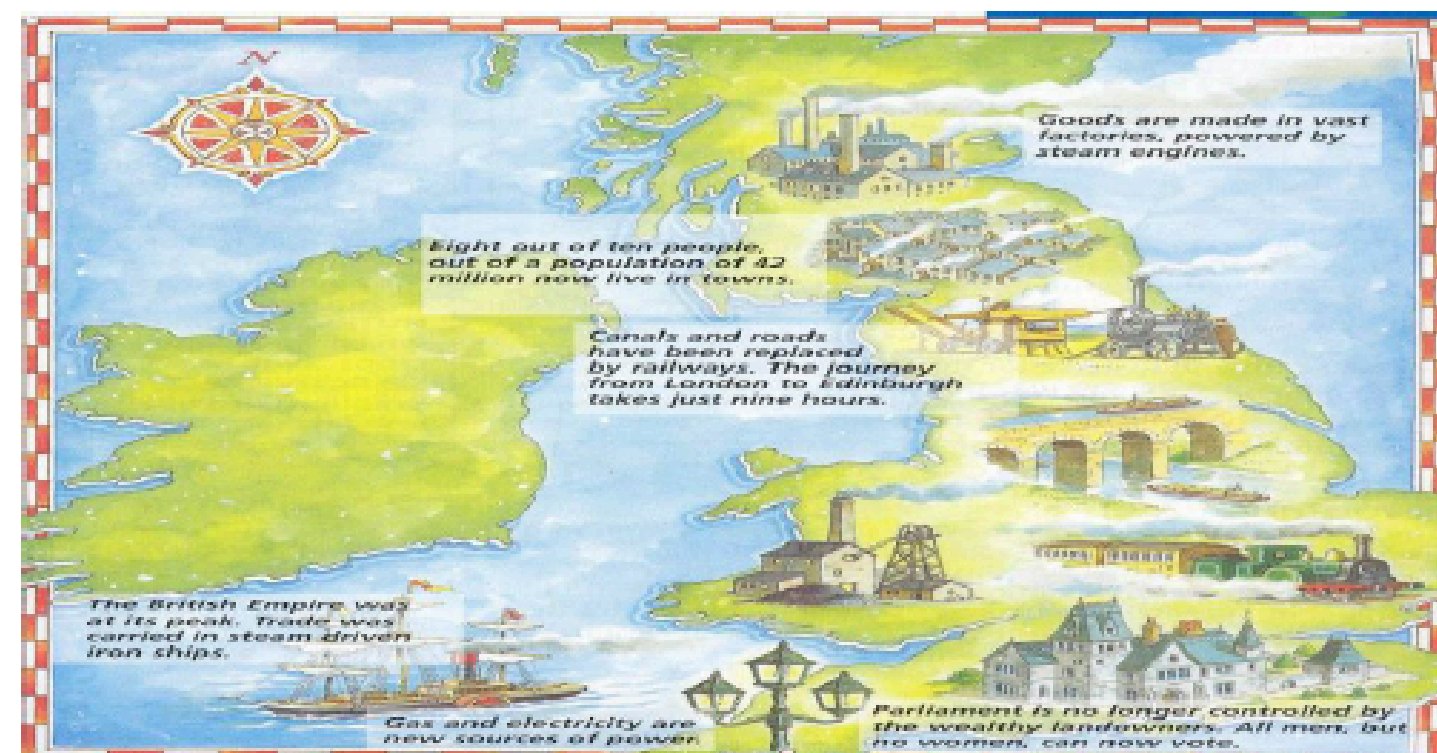
Ada Lovelace: first computer programmer and brilliant mathematician

History Year 8 Knowledge Organiser Summer Term

1) Britain before Industrialisation



2) Britain after Industrialisation



2) Timeline of Public Health

1831: Cholera strikes

1842: Chadwick Report

1848: First Public Health Act

1854: John Snow proves cholera is in water

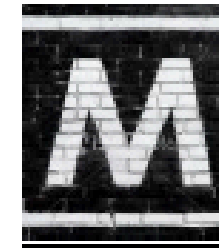
1858: Great Stink. Bazalgette is given money to build sewers in London

1875: Second Public Health Act

1889: Booth writes report on living conditions in London

1901: Rowntree writes his report on living conditions in York

4. Causes of World War One



Militarism- Building up weapon stores and armories in preparation for war. Russia had million soldiers. Germany 5 million. France 4 million.



Alliances- Countries made agreements with each other that they would defend each other against other countries. Triple Alliance: Austria-Hungary; Germany; Italy. Triple Ententes: Britain; France; Russia.



Imperialism – the desire to expand and control other countries. Britain had previously had the biggest empire. Now many in Germany felt it was their opportunity.



Nationalism- Love and pride in your own country and dislike or even hatred of other countries. A belief your country is better



THS

TIVERTON HIGH SCHOOL

Year 8

Maths

Work hard. Be kind. Belong.

YEAR 8 - ALGEBRAIC TECHNIQUES...

Sequences

What do I need to be able to do?

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

- Generate a sequence from term to term or position to term rules
- Recognise arithmetic sequences and find the n th term
- Recognise geometric sequences and other sequences that arise

Keywords

Sequence: items or numbers put in a pre-decided order

Term: a single number or variable

Position: the place something is located

Linear: the difference between terms increases or decreases (+ or -) by a constant value each time

Non-linear: the difference between terms increases or decreases in different amounts, or by x or $\div$

Difference: the gap between two terms

Arithmetic: a sequence where the difference between the terms is constant

Geometric: a sequence where each term is found by multiplying the previous one by a fixed non zero number

Linear and Non Linear Sequences

Linear Sequences — increase by addition or subtraction and the same amount, each time

Non-linear Sequences — do not increase by a constant amount — quadratic, geometric and Fibonacci

- Do not plot as straight lines when modelled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

Fibonacci Sequence — look out for this type of sequence

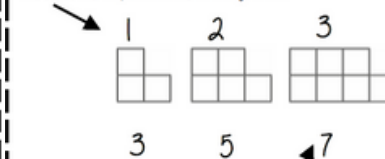
0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms



Sequence in a table and graphically

Position: the place in the sequence

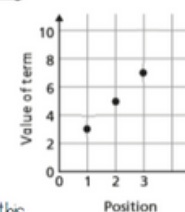


Term: the number or variable (the number of squares in each image)

Position	1	2	3
Term	1	4	9

+2 +2

Graphically



"The term in position 3 has 9 squares"

Sequences from algebraic rules

This is substitution!

$$3n + 7$$

$$3n^2 + 7$$

This will be linear - note the single power of n . The values increase at a constant rate

This is not linear as there is a power for n

$$2n - 5 \rightarrow$$

Substitute the number of the term you are looking for in place of ' n '

eg
1st term = $2(1) - 5 = -3$
2nd term = $2(2) - 5 = -1$
100th term = $2(100) - 5 = 195$

Checking for a term in a sequence

Form an equation

Is 201 in the sequence $3n - 4$?

$$3n - 4 = 201$$

Solving this will find the position of the term in the sequence. ONLY an integer solution can be in the sequence.

Complex algebraic rules

Misconceptions and comparisons

$$2n^2$$

$$(2n)^2$$

2 times whatever n squared is

2 times n then square the answer

eg
1st term = $2 \times 1^2 = 2$
2nd term = $2 \times 2^2 = 8$
100th term = $2 \times 100^2 = 20000$

eg
1st term = $(2 \times 1)^2 = 4$
2nd term = $(2 \times 2)^2 = 16$
100th term = $(2 \times 100)^2 = 40000$

$$n(n + 5)$$

eg
1st term = $1(1 + 5) = 6$
2nd term = $2(2 + 5) = 14$
100th term = $100(100 + 5) = 10500$

You don't need to expand the expression

YEAR 8 - ALGEBRAIC TECHNIQUES...

Sequences

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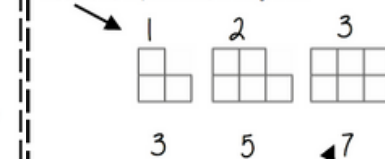
0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms



Sequence in a table and graphically

Position: the place in the sequence

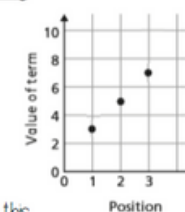


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Graphically



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You don't need to expand the expression

H Finding the algebraic rule

This is the 4 times table $\rightarrow 4, 8, 12, 16, 20, \dots$

$$4n$$

7, 11, 15, 19, 22

This has the same constant difference — but is 3 more than the original sequence

$$4n + 3$$

This is the constant difference between the terms in the sequence

This is the comparison (difference) between the original and new sequence

H Finding the algebraic rule

This is the 4 times table $\rightarrow 4, 8, 12, 16, 20, \dots$

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YEAR 8 - REPRESENTATIONS...

Working in the Cartesian plane

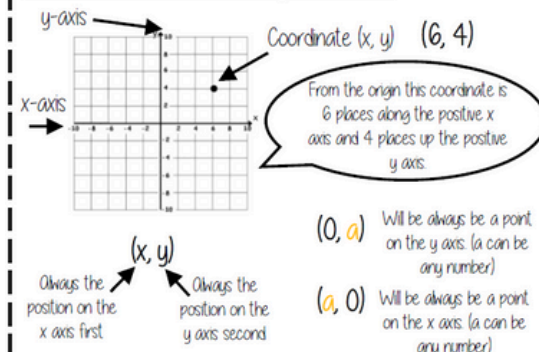
What do I need to be able to do?

- By the end of this unit you should be able to:
- Label and identify lines parallel to the axes
 - Recognise and use basic straight lines
 - Identify positive and negative gradients
 - Link linear graphs to sequences
 - Plot $y = mx + c$ graphs

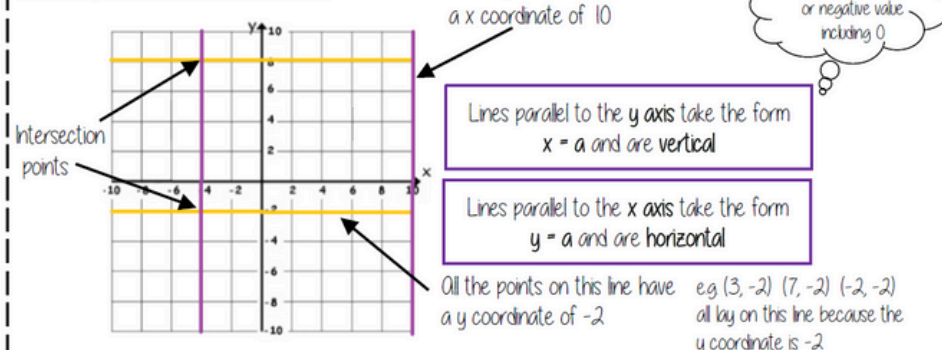
Keywords

- Quadrant:** four quarters of the coordinate plane.
Coordinate: a set of values that show an exact position.
Horizontal: a straight line from left to right (parallel to the x axis)
Vertical: a straight line from top to bottom (parallel to the y axis)
Origin: (0,0) on a graph. The point the two axes cross
Parallel: Lines that never meet
Gradient: The steepness of a line
Intercept: Where lines cross

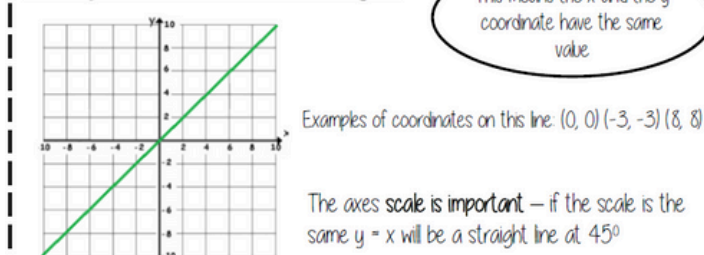
Coordinates in four quadrants



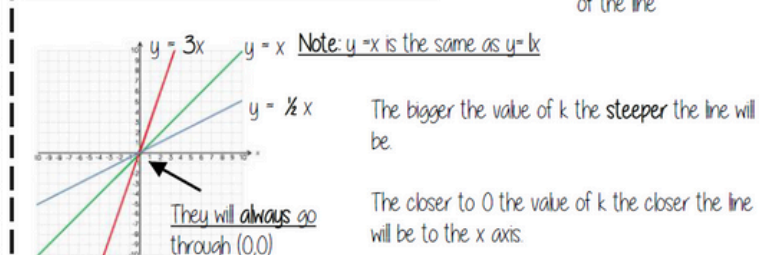
Lines parallel to the axes



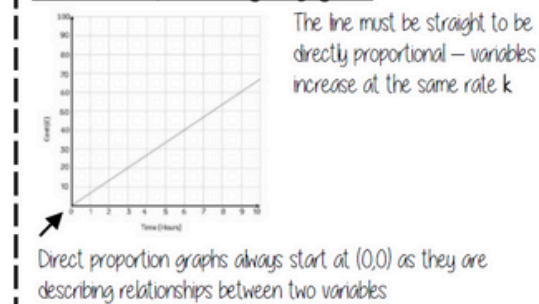
Recognise and use the line $y=x$



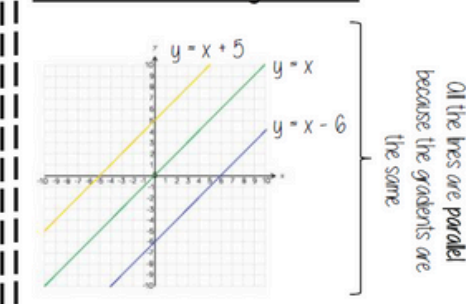
Recognise and use the lines $y=kx$



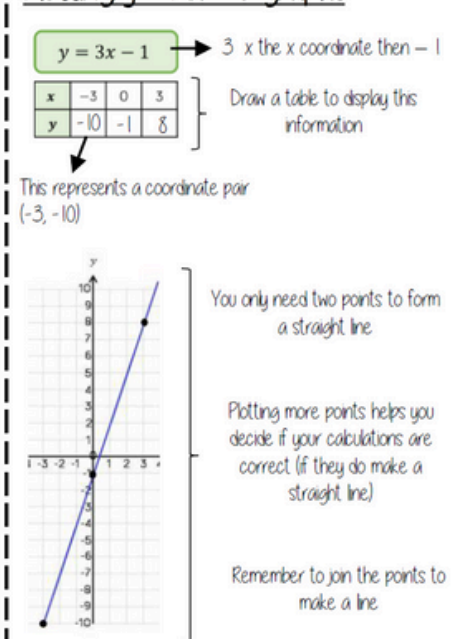
Direct Proportion using $y=kx$



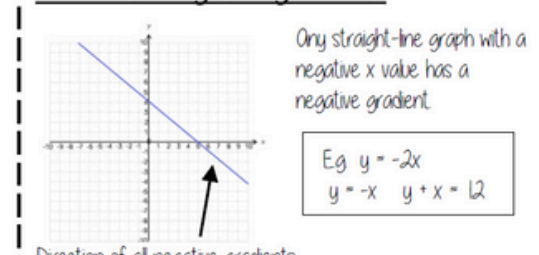
Lines in the form $y = x + a$



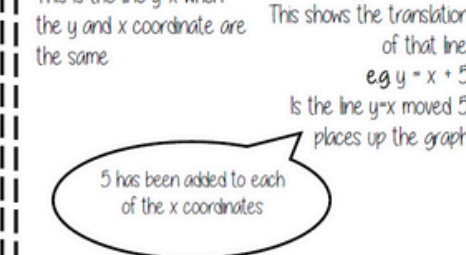
Plotting $y = mx + c$ graphs



Lines with negative gradients



Lines in the form $y = x + a$



YEAR 8 - DEVELOPING GEOMETRY...

Angles in parallel lines and polygons

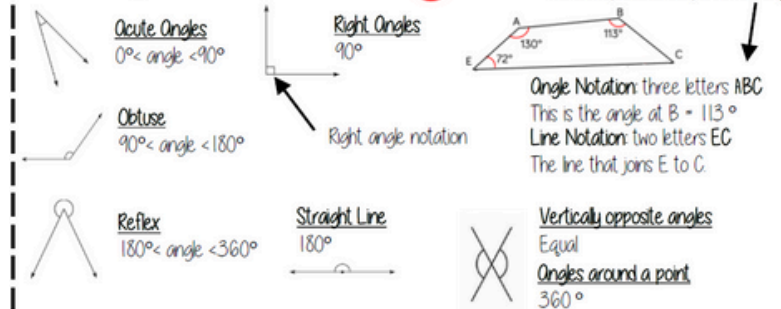
What do I need to be able to do?

- By the end of this unit you should be able to:
- Identify alternate angles
 - Identify corresponding angles
 - Identify co-interior angles
 - Find the sum of interior angles in polygons
 - Find the sum of exterior angles in polygons
 - Find interior angles in regular polygons

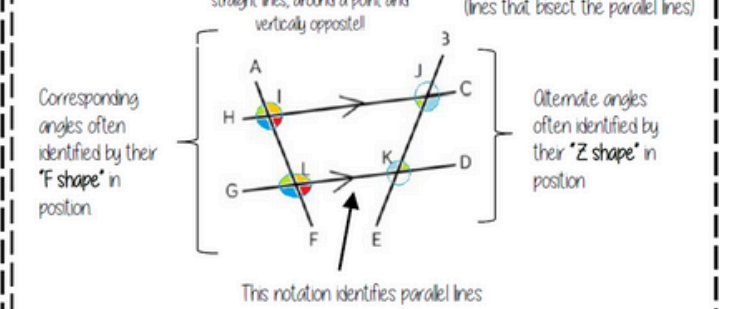
Keywords

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

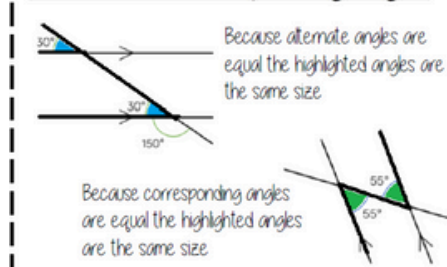
Basic angle rules and notation



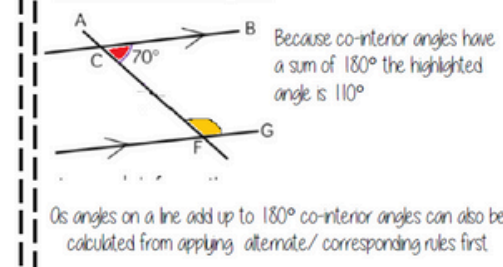
Parallel lines



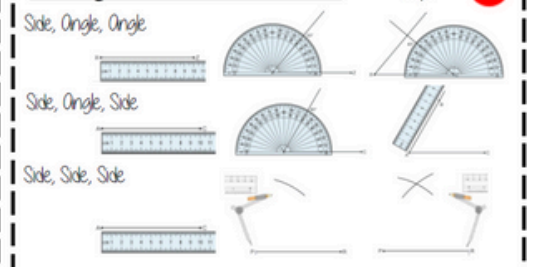
Alternate/ Corresponding angles



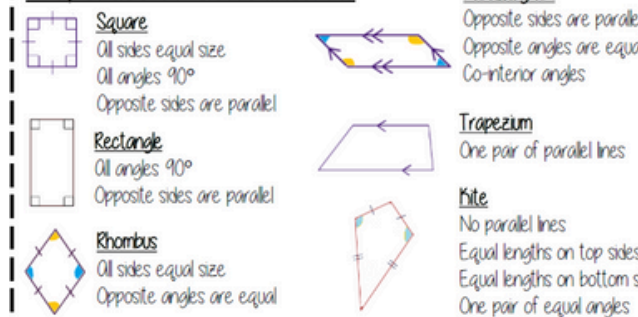
Co-interior angles



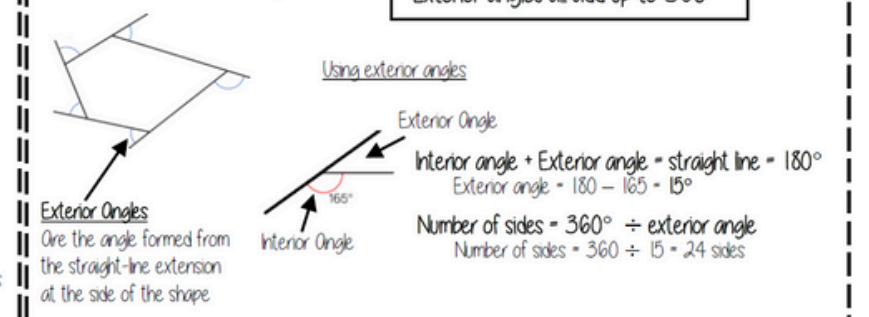
Triangles & Quadrilaterals



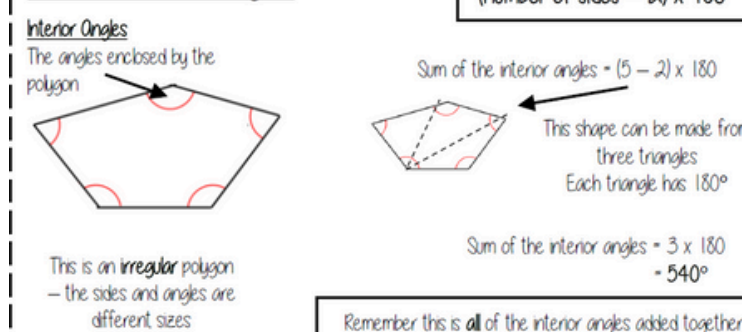
Properties of Quadrilaterals



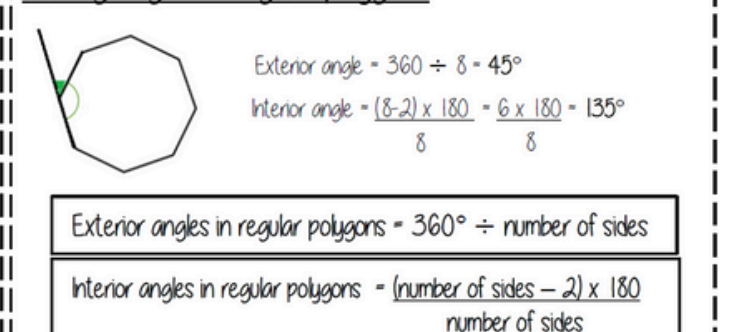
Sum of exterior angles



Sum of interior angles



Missing angles in regular polygons



YEAR 8 - LINES AND ANGLES

Constructing, measuring and using geometric notation

What do I need to be able to do?

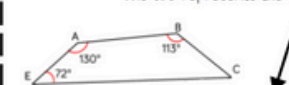
- By the end of this unit you should be able to:
- Use letter and labelling conventions
 - Draw and measure line segments and angles
 - Identify parallel and perpendicular lines
 - Recognise types of triangle
 - Recognise types of quadrilateral
 - Identify polygons
 - Construct triangles (SAS, SSS, ASA)
 - 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

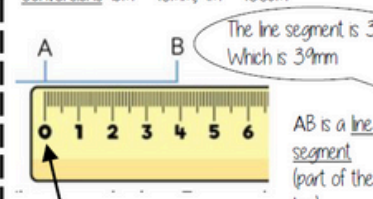


Angle Notation: three letters ABC
 This is the angle at B = 113°

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

Draw and measure line segments

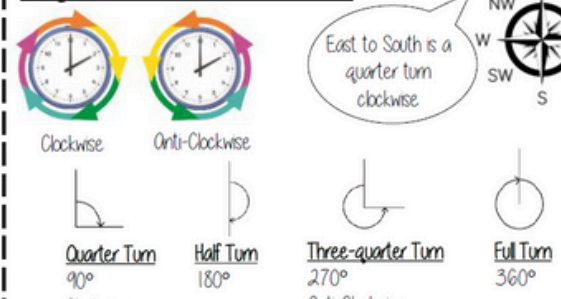
Conversions: 1cm = 10mm, 1m = 100cm



AB is a line segment (part of the line)

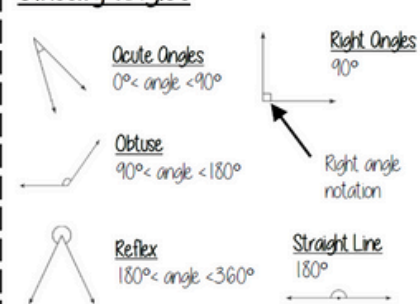
Make sure the start of the line is at 0.

Angles as measures of turn

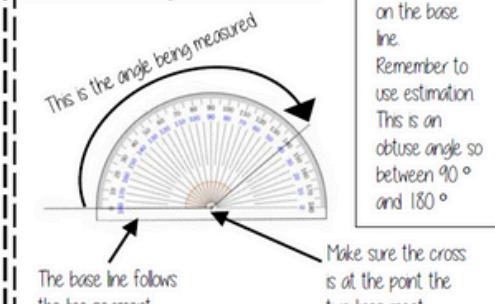


East to South is a quarter turn clockwise

Classify angles

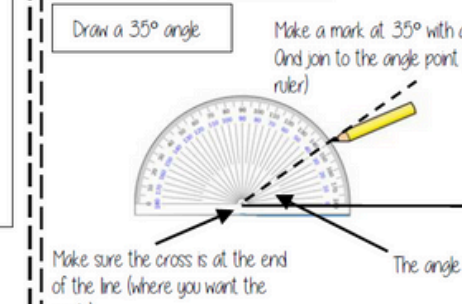


Measure angles to 180°



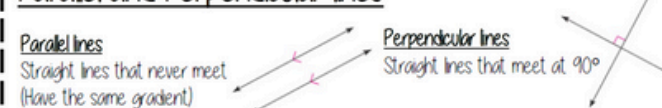
The base line follows the line segment

Draw angles up to 180°



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

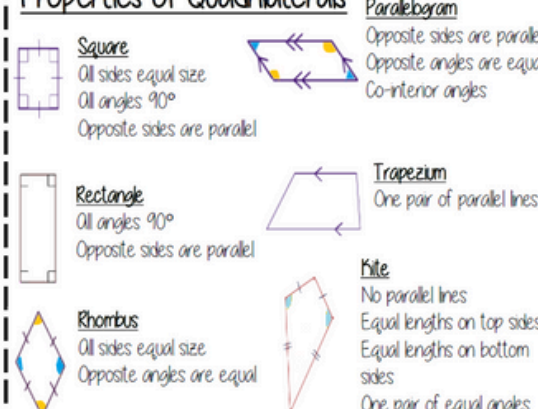
Parallel and Perpendicular lines



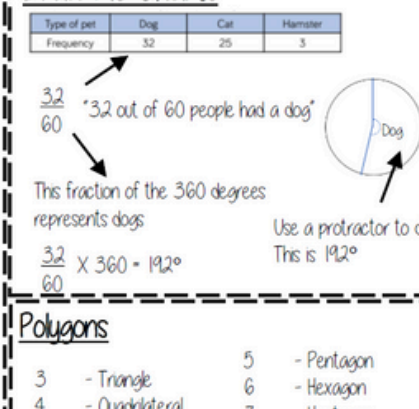
Angles over 180°



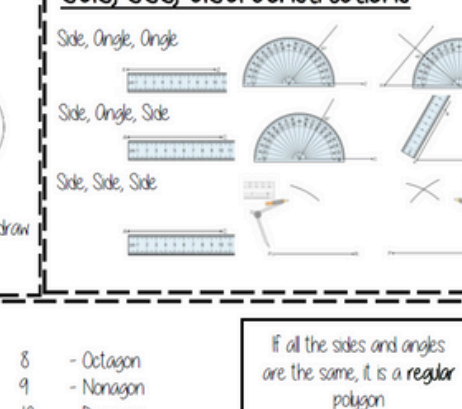
Properties of Quadrilaterals



Draw Pie Charts



SAS, SSS, ASA constructions



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

YEAR 8 - APPLICATION OF NUMBER

Solving problems with multiplication and division

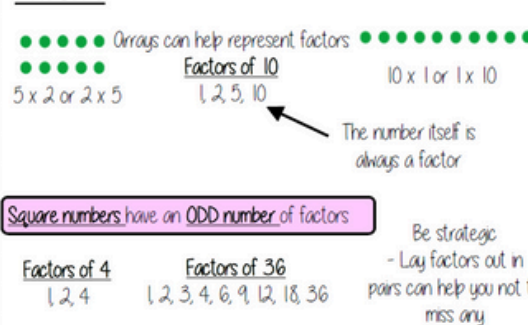
What do I need to be able to do?

- By the end of this unit you should be able to:
- Understand and use factors
 - Understand and use multiples
 - Multiply/Divide integers and decimals by powers of 10
 - Use formal methods to multiply
 - Use formal methods to divide
 - Understand and use order of operations
 - Solve area problems
 - Solve problems using the mean

Keywords

Array: an arrangement of items to represent concepts in rows or columns
Multiples: found by multiplying any number by positive integers
Factor: integers that multiply together to get another number
Mil: prefix meaning one thousandth
Centi: prefix meaning one hundredth
Kilo: prefix meaning multiply by 1000
Quotient: the result of a division
Dividend: the number being divided
Divisor: the number we divide by

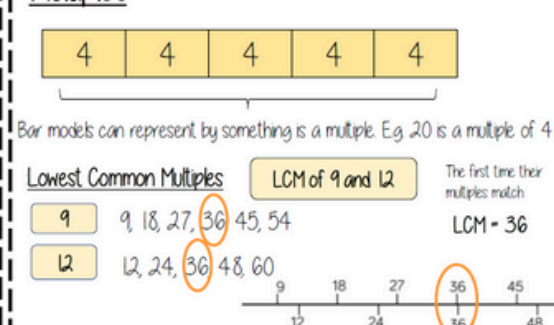
Factors



Square numbers have an ODD number of factors

Factors of 4: 1, 2, 4
Factors of 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

Multiples



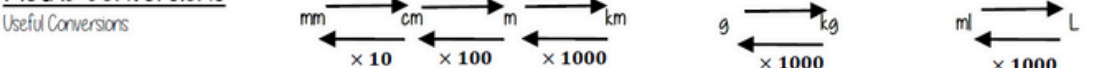
Bar models can represent by something is a multiple. E.g. 20 is a multiple of 4

Lowest Common Multiples: 9, 18, 27, 36, 45, 54
 12, 24, 36, 48, 60

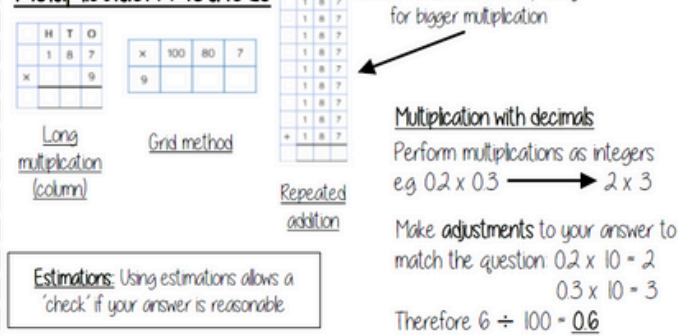
Multiply/Divide by powers of 10



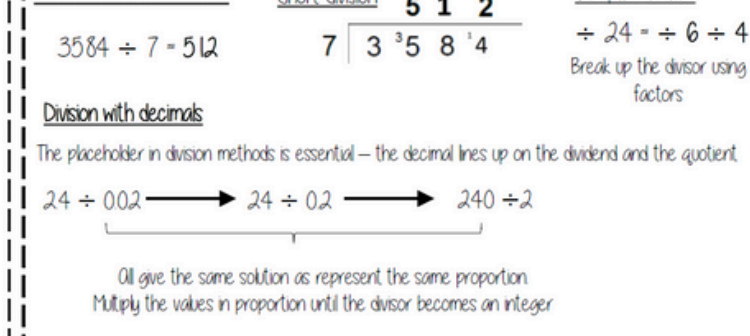
Metric conversions



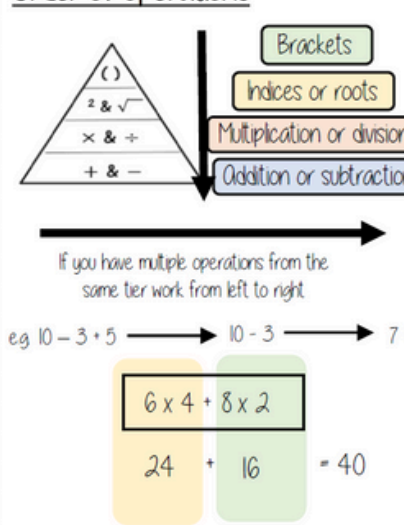
Multiplication methods



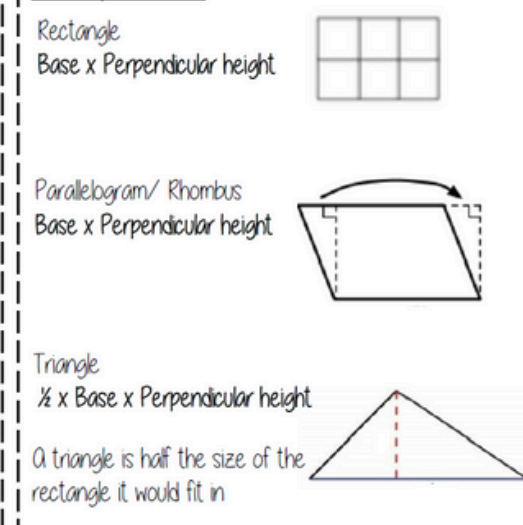
Division methods



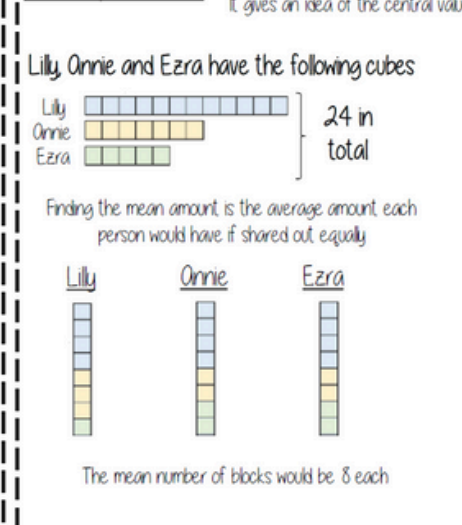
Order of operations



Area problems



Mean problems



YEAR 8 - DIRECTED NUMBER

Operations with equations and directed numbers

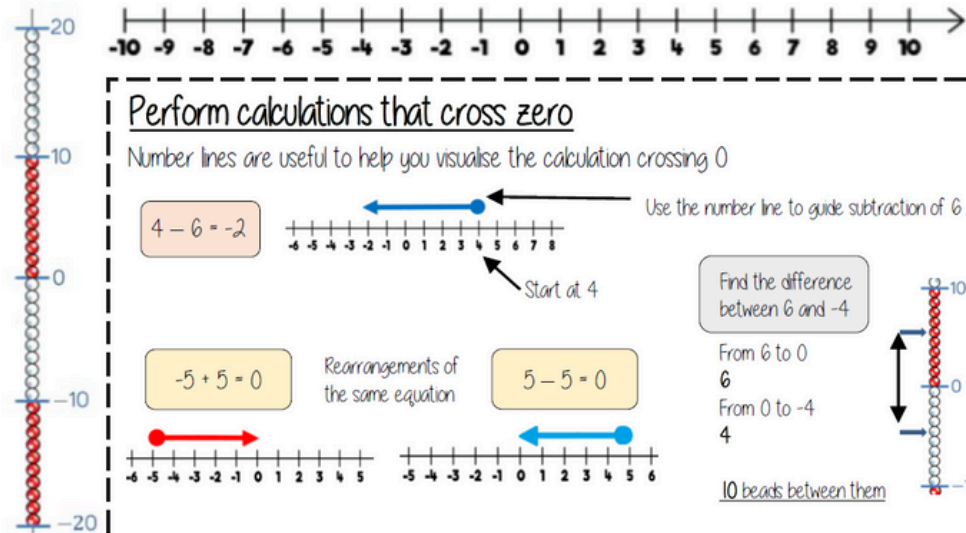
What do I need to be able to do?

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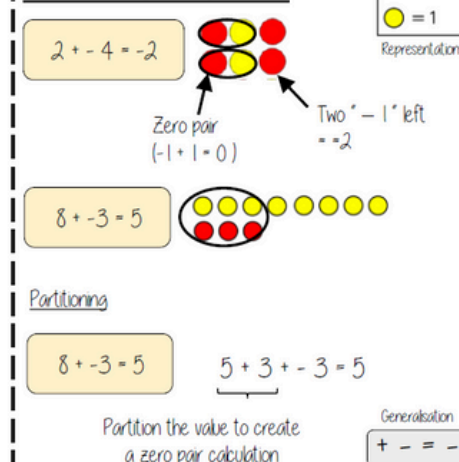
- Perform calculations that cross zero
- Add/ Subtract directed numbers
- Multiply/ Divide directed numbers
- Evaluate algebraic expressions
- Solve two-step equations
- Use order of operations with directed number

Keywords

Subtract: taking away one number from another.
 Negative: a value less than zero.
 Commutative: changing the order of the operations does not change the result.
 Product: multiply terms
 Inverse: the opposite function
 Square root: a square root of a number is a number when multiplied by itself gives the value (symbol $\sqrt{\quad}$)
 Square: a term multiplied by itself.
 Expression: a maths sentence with a minimum of two numbers and at least one math operation (no equals sign)

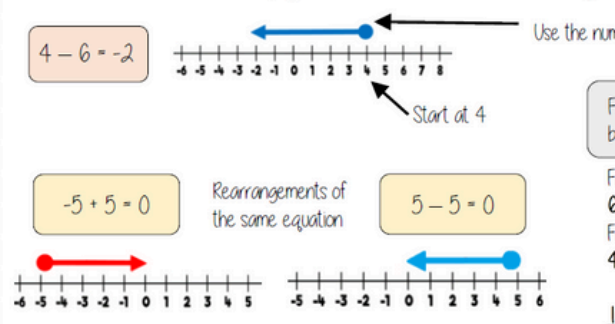


Add directed numbers

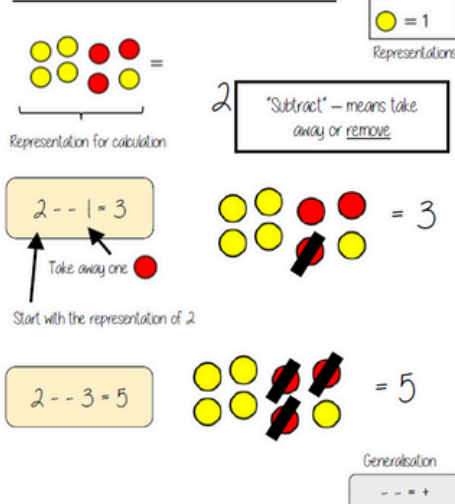


Perform calculations that cross zero

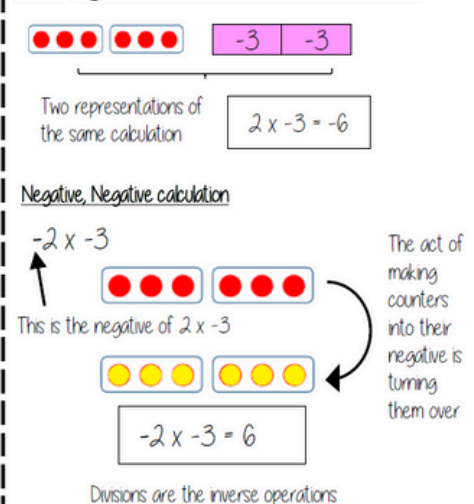
Number lines are useful to help you visualise the calculation crossing 0



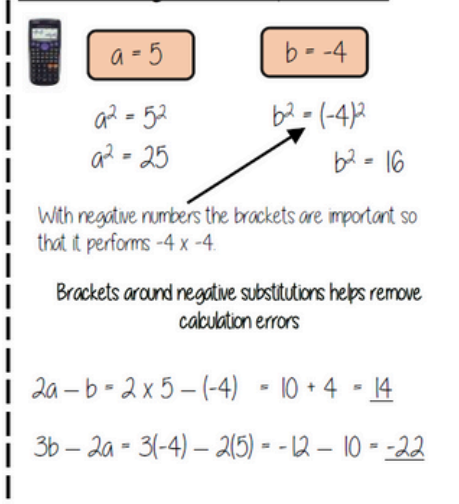
Subtract directed numbers



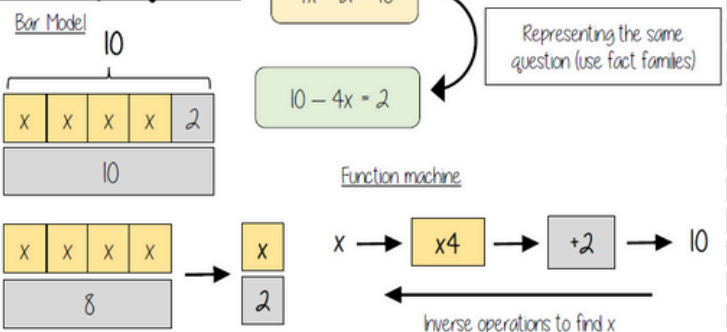
Multiply/ Divide directed numbers



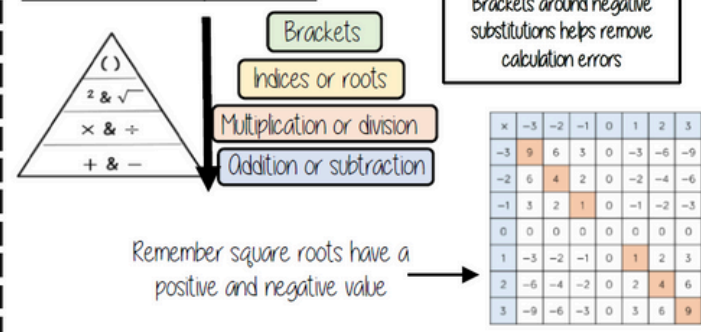
Evaluate algebraic expressions



Two-step equations



Use order of operations



YEAR 8 - PROPORTIONAL REASONING...

Multiplying and Dividing Fractions

What do I need to be able to do?

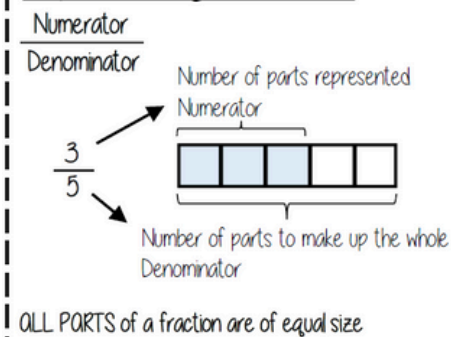
By the end of this unit you should be able to:

- Carry out any multiplication or division using fractions and integers
- Solutions can be modelled, described and reasoned

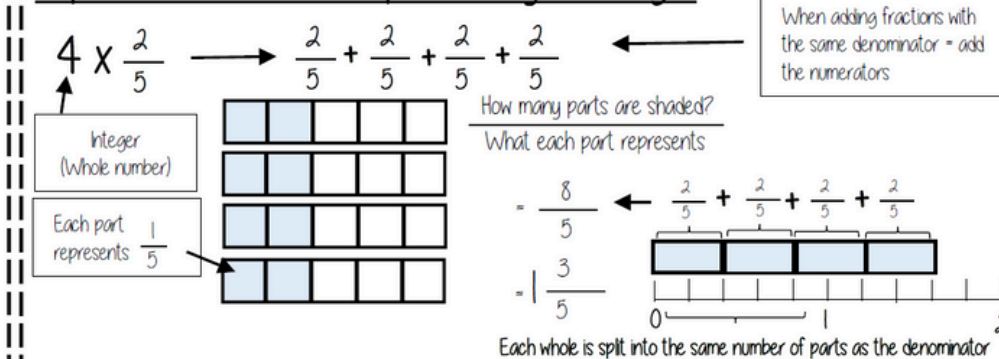
Keywords

Numerator: the number above the line on a fraction. The top number. Represents how many parts are taken.
 Denominator: the number below the line on a fraction. The number represent the total number of parts.
 Whole: a positive number including zero without any decimal or fractional parts.
 Commutative: an operation is commutative if changing the order does not change the result.
 Unit Fraction: a fraction where the numerator is one and denominator a positive integer.
 Non-unit Fraction: a fraction where the numerator is larger than one.
 Dividend: the amount you want to divide up.
 Divisor: the number that divides another number.
 Quotient: the answer after we divide one number by another. e.g. dividend ÷ divisor = quotient.
 Reciprocal: a pair of numbers that multiply together to give 1.

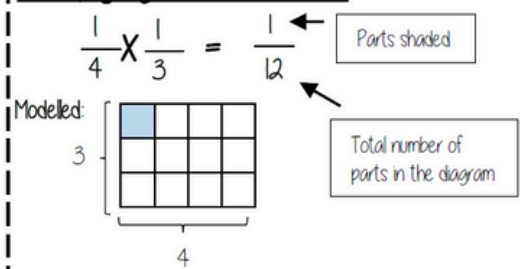
Representing a fraction



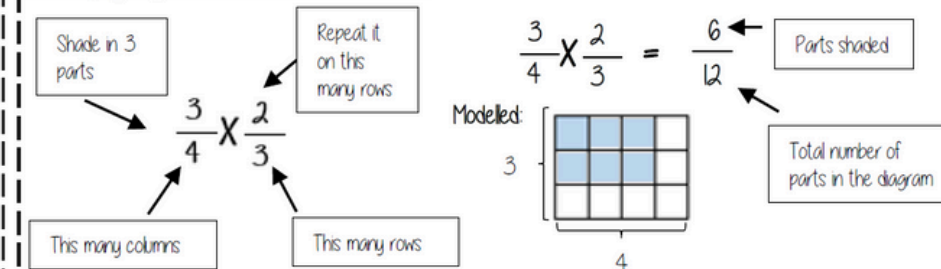
Repeated addition = multiplication by an integer



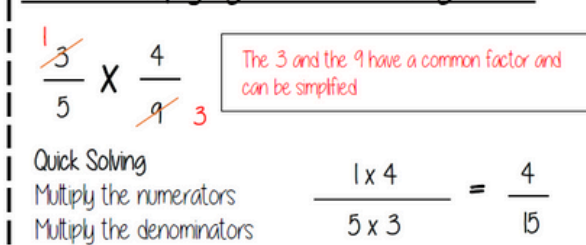
Multiplying unit fractions



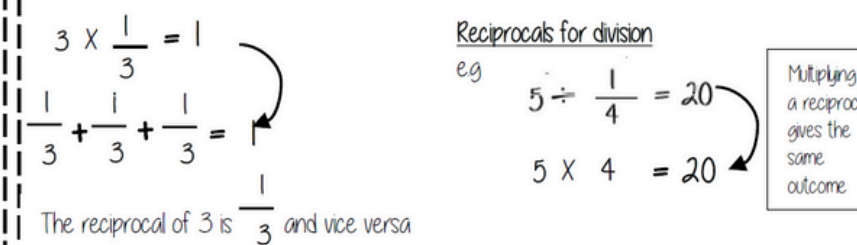
Multiplying non-unit fractions



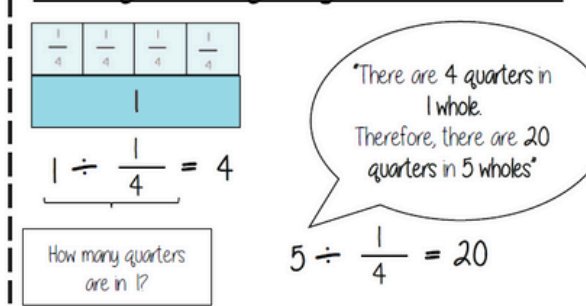
Quick Multiplying and Cancelling down



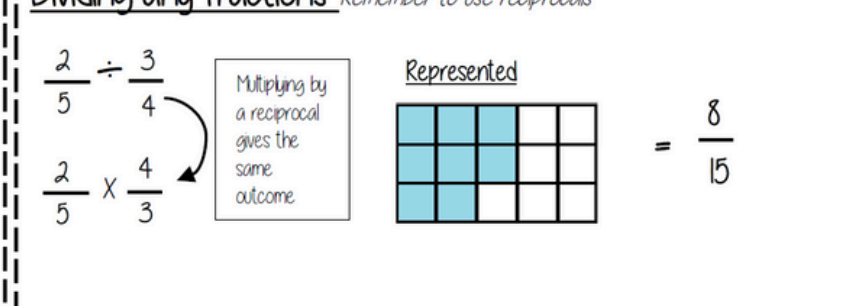
The reciprocal



Dividing an integer by a unit fraction



Dividing any fractions



YEAR 8 - ALGEBRAIC TECHNIQUES...

Brackets, Equations & Inequalities

What do I need to be able to do?

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

- Form Expressions
- Expand and factorise single brackets
- Form and solve equations
- Solve equations with brackets
- Represent inequalities
- Form and solve inequalities

Keywords

Simplify: grouping and combining similar terms
Substitute: replace a variable with a numerical value
Equivalent: something of equal value
Coefficient: a number used to multiply a variable
Product: multiply terms
Highest Common Factor (HCF): the biggest factor (or number that multiplies to give a term)
Inequality: an inequality compares two values showing if one is greater than, less than or equal to another

Form expressions

For unknown variables, a letter is normally used in its place

More than – ADD

Less than/ difference – SUBTRACT

eg 4 more than t $\rightarrow t + 4$
 8 less than k $\rightarrow k - 8$

Only similar terms can be grouped together

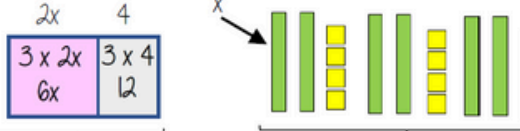
eg Find the perimeter of this shape
 (Perimeter = length around outside of shape)
 t 
 $2t + 1$ $t + 2t + 1 + t + 2t + 1 \rightarrow 6t + 2$

Directed numbers

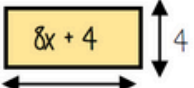
$++ \rightarrow +$
 $-- \rightarrow +$
 $+- \rightarrow -$
 $-+ \rightarrow -$

eg $a = -5$ and $b = 2$
 $a^2 = a \times a = -5 \times -5 = 25$
 $b + a = 2 + -5 = -3$

Multiply single brackets

$3(2x + 4)$

 $6x + 12$
 Different representations of $3(2x + 4) = 6x + 12$

Factorise into a single bracket

$8x + 4$

 Try and make this the highest common factor
 The two values multiply together (also the area) of the rectangle
 $8x + 4 \equiv 4(2x + 1)$
 Note: $8x + 4 \equiv 2(4x + 2)$
 This is factorised but the HCF has not been used

Solve equations with brackets

$3(2x + 4) = 30$

 Expand the brackets
 $6x + 12 = 30$
 -12
 $6x = 18$
 -6
 $x = 3$
 Substitute to check your answer. This could be negative or a fraction or decimal

Simple Inequalities

$<$ less than $\leq$ Less than or equal to
 $>$ More than $\geq$ More than or equal to

eg $x < 10$
 Say this out loud "x is a value less than 10"
 Note: $x < 10$ and $10 > x$ represent the same values
 $x + 2 \leq 20$
 "my value + 2 is less than or equal to 20"
 $x \leq 18$
 The biggest the value can be is 18

Form and solve inequalities

Two more than treble my number is greater than 11
 Find the possible range of values
Form
 $x \rightarrow x \times 3 \rightarrow +2 \rightarrow 11$
 $3x + 2 > 11$
Solve
 $x \leftarrow -2 \leftarrow -3 \leftarrow 11$
 $x > 3$
Check
 This would suggest any value bigger than 3 satisfies the statement
 $3 \times 3 + 2 = 11 \checkmark$ $10 \times 3 + 2 = 32 \checkmark$

Algebraic constructs

Expression
 A sentence with a minimum of two numbers and one maths operation
Equation
 A statement that two things are equal
Term
 A single number or variable
Identity
 An equation where both sides have variables that cause the same answer includes $\equiv$
Formula
 A rule written with all mathematical symbols
 eg area of a rectangle $A = b \times h$

YEAR 8 - REASONING WITH ALGEBRA...

Forming and Solving Equations

What do I need to be able to do?

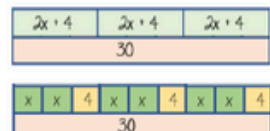
By the end of this unit you should be able to:

- Solve inequalities with negative numbers
- Solve equations with unknowns on both sides
- Solve inequalities with unknowns on both sides
- Substitute into formulae and equations
- Rearrange formulae

Keywords

Inequality: an inequality compares two values showing if one is greater than, less than or equal to another
Variable: a quantity that may change within the context of the problem
Rearrange: Change the order
Inverse operation: the operation that reverses the action
Substitute: replace a variable with a numerical value
Solve: find a numerical value that satisfies an equation

Solve equations with brackets

$3(2x + 4) = 30$

 Expand the brackets
 $6x + 12 = 30$
 -12
 $6x = 18$
 -6
 $x = 3$

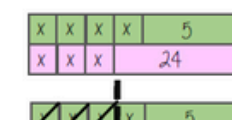
Form and solve inequalities

Two more than treble my number is greater than 11
 Find the possible range of values
 $3x + 2 > 11$
Solve
 $x \leftarrow -2 \leftarrow -3 \leftarrow 11$
 $x > 3$

Inequalities with negatives

Method 1 Make x positive first
 $2 - 3x > 17$
 $+3x$
 $2 > 17 + 3x$
 -17
 $-15 > 3x$
 $\div 3$
 $-5 > x$
 x is true for any value smaller than -5
CHECK IT!
 $2 - 3(-6) = 20$
 TRUE/ CORRECT

Equations with unknown on both sides

$4x + 5 = 3x + 24$
 $-3x$
 $x + 5 = 24$
 -5
 $x = 19$


Inequalities with unknown on both sides

Solving inequalities has the same method as equations
 $5(x + 4) < 3(x + 2)$
Check it!
 $5x + 20 < 3x + 6$
 $2x + 20 < 6$
 $2x < -14$
 $x < -7$
 $5(-8 + 4) < 3(-8 + 2)$
 $5(-4) < 3(-6)$
 $-20 < -18$
 -20 is smaller than -18

Method 2 Keep the negative x
 $2 - 3x > 17$
 -2
 $-3x > 15$
 $\div -3$
 $x > -5$
 x is true for any value bigger than -5
This cannot be true...
 $x < -5$
 When you multiply or divide x by a negative you need to reverse the inequality

Formulae and Equations

Formulae – all expressed in symbols
 Equations – include numbers and can be solved

Rearranging Formulae (one step)

$x = y + z$
 Rearrange to make y the subject
 $y = x - z$

 Using inverse operations or fact families will guide you through rearranging formulae
 Rearranging can also be checked by substitution
 Language of rearranging...
 Make XXX the subject
 Change the subject
 Rearrange

Rearranging Formulae (two step)

In an equation (find x)
 $4x - 3 = 9$
 $+3$
 $4x = 12$
 $\div 4$
 $x = 3$
 In a formula (make x the subject)
 $xy - s = a$
 $+s$
 $xy = a + s$
 $\div y$
 $x = \frac{a + s}{y}$
 The steps are the same for solving and rearranging
 Rearranging is often needed when using $y = mx + c$
 eg Find the gradient of the line $2y - 4x = 9$
 Make y the subject first $y = \frac{4x + 9}{2}$
 Gradient = $\frac{4}{2} = 2$

YEAR 8 - DEVELOPING GEOMETRY...

Area of trapezia and Circles

What do I need to be able to do?

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

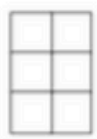
- Recall area of basic 2D shapes
- Find the area of a trapezium
- Find the area of a circle
- Find the area of compound shapes
- Find the perimeter of compound shapes

Keywords

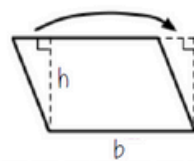
Congruent: The same
Area: Space inside a 2D object
Perimeter: Length around the outside of a 2D object
 π (π): The ratio of a circle's circumference to its diameter.
Perpendicular: At an angle of 90° to a given surface
Formula: A mathematical relationship/ rule given in symbols. E.g. $b \times h$ = area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

Area — rectangles, triangles, parallelograms

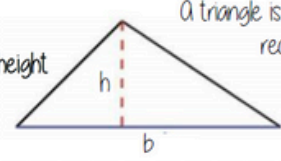
Rectangle
Base x Height



Parallelogram/ Rhombus
Base x Perpendicular height



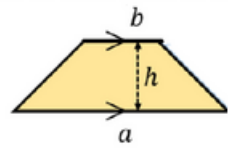
Triangle
 $\frac{1}{2} \times$ Base x Perpendicular height



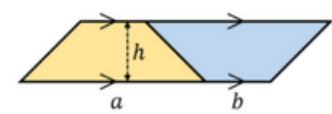
A triangle is half the size of the rectangle it would fit in

Area of a trapezium

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



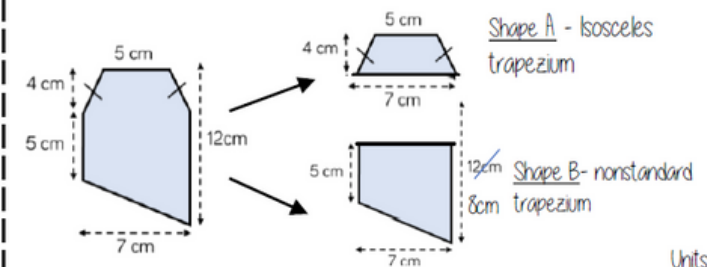
Why?



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

Compound shapes

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



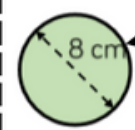
$$\text{Shape A} + \text{Shape B} = \text{total area}$$

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

Units

Area of a circle (Non-Calculator)

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



Diameter = 8 cm
 $\therefore$ Radius = 4 cm

$$\pi \times \text{radius}^2$$

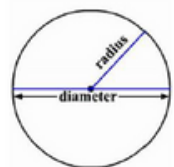
$$= \pi \times 4^2$$

$$= \pi \times 16$$

$$= 16\pi \text{ cm}^2$$

Find the area of one quarter of the circle

Area of a circle
 $\pi \times \text{radius}^2$



Radius = 4 cm
Circle Area = $16\pi \text{ cm}^2$
Quarter = $4\pi \text{ cm}^2$

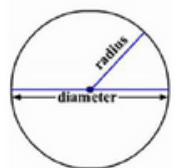
Area of a circle (Calculator)



SHIFT $\times 10^x$

How to get π symbol on the calculator

Area of a circle
 $\pi \times \text{radius}^2$



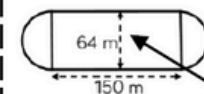
It is important to round your answer suitably — to significant figures or decimal places. This will give you a decimal solution that will go on forever!

Compound shapes including circles

Circumference
 $\pi \times \text{diameter}$

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

Spotting diameters and radii



This dimension is also the diameter of the semi circles

$$\text{Arc lengths} = \pi \times 64$$

$$= 64\pi$$

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

Arc lengths + Straight lengths = total perimeter

$$= 64\pi + 150 + 150$$

$$= (300 + 64\pi) \text{ m}$$

$$\text{OR} = 501.1 \text{ m}$$

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

YEAR 8 - CONSTRUCTING IN 2D/3...

3D Shapes

What do I need to be able to do?

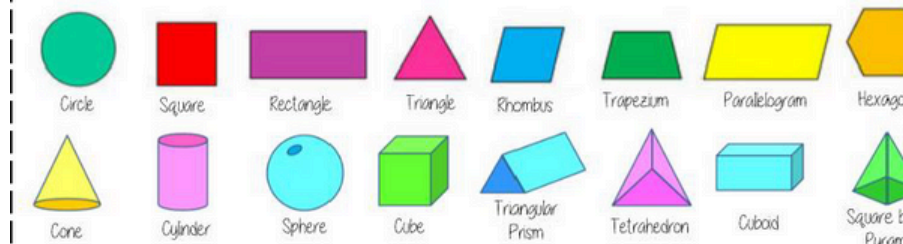
By the end of this unit you should be able to:

- Name 2D & 3D shapes
- Recognise Prisms
- Sketch and recognise nets
- Draw plans and elevations
- Find areas of 2D shapes
- Find Surface area for cubes, cuboids, triangular prisms and cylinders
- Find the volume of 3D shapes

Keywords

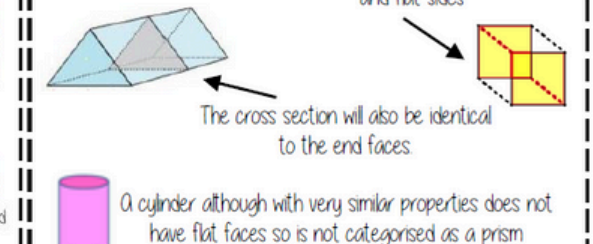
2D: two dimensions to the shape e.g. length and width
3D: three dimensions to the shape e.g. length, width and height
Vertex: a point where two or more line segments meet
Edge: a line on the boundary joining two vertex
Face: a flat surface on a solid object
Cross-section: a view inside a solid shape made by cutting through it
Plan: a drawing of something when drawn from above (sometimes birds eye view)
Perspective: a way to give illustration of a 3D shape when drawn on a flat surface.

Name 2D & 3D shapes

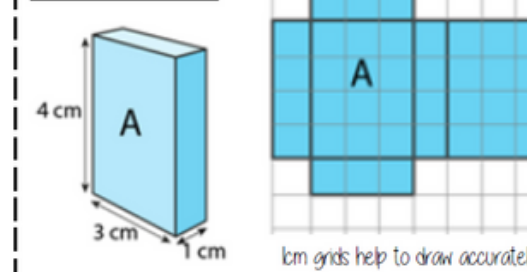


Recognise prisms

A solid object with two identical ends and flat sides

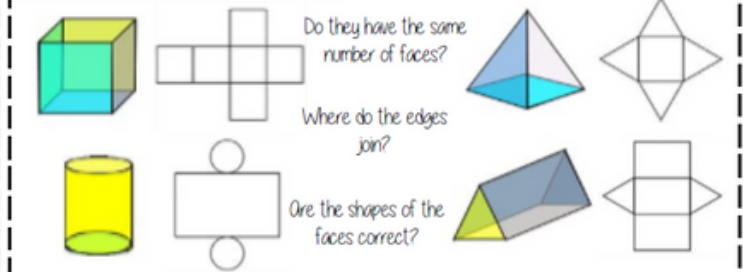


Nets of cuboids

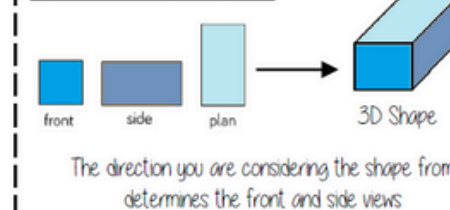


Visualise the folding of the net. Will it make the cuboid with all sides touching

Sketch and recognise nets

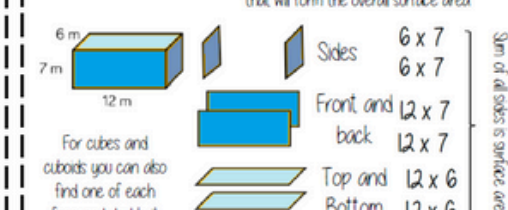


Plans and elevations



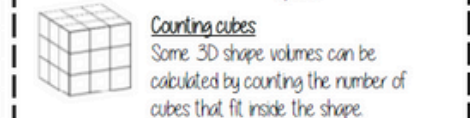
Surface area

Sketching nets first helps you visualise all the sides that will form the overall surface area



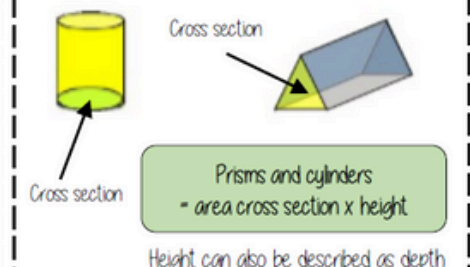
Volumes

Volume is the 3D space it takes up — also known as capacity if using liquids to fill the space



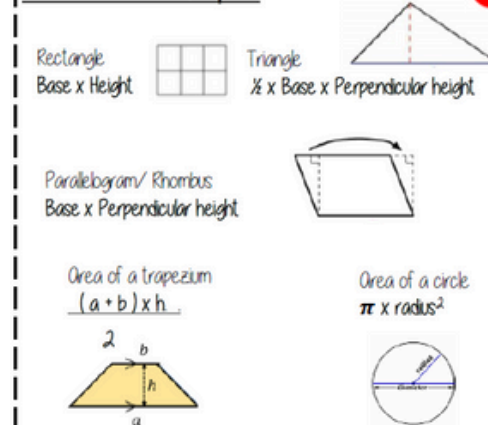
Cubes/ Cuboids = base x width x height

Remember multiplication is commutative

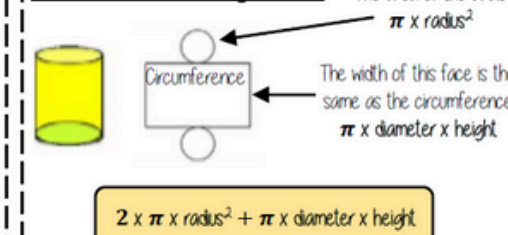


Areas — square units
 Volumes — cube units
 Areas and volumes can be left in terms of π

Area of 2D shapes



Surface area - cylinders



YEAR 8 - DEVELOPING NUMBER...

Fractions & Percentages

What do I need to be able to do?

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

- Convert between FDP less than and more than 100.
- Increase or decrease using multipliers.
- Express an amount as a percentage.
- Find percentage change.

Keywords

Percent: parts per 100 – written using the % symbol

Decimal: a number in our base 10 number system. Numbers to the right of the decimal place are called decimals.

Fraction: a fraction represents how many parts of a whole value you have.

Equivalent: of equal value.

Reduce: to make smaller in value.

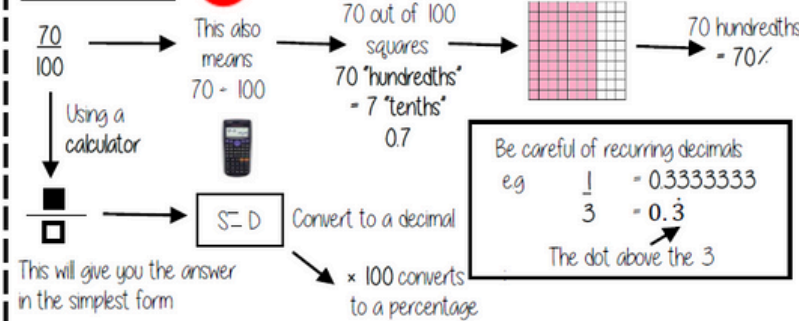
Growth: to increase/ to grow.

Integer: whole number, can be positive, negative or zero.

Invest: use money with the goal of it increasing in value over time (usually in a bank).

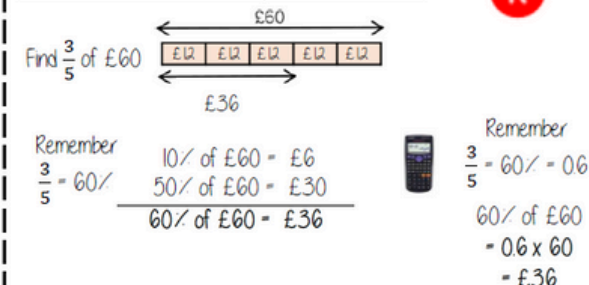
Convert FDP

R

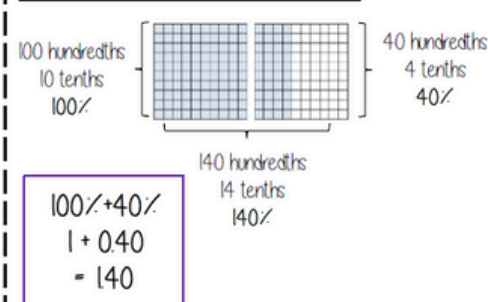


Fraction/ Percentage of amount

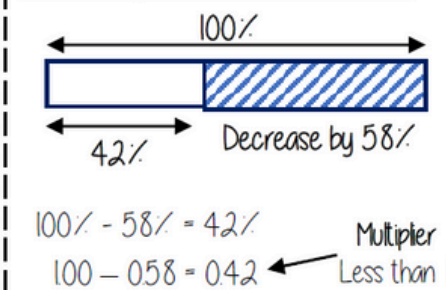
R



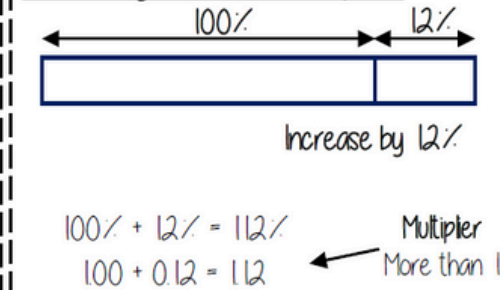
Convert FDP < and > 100%



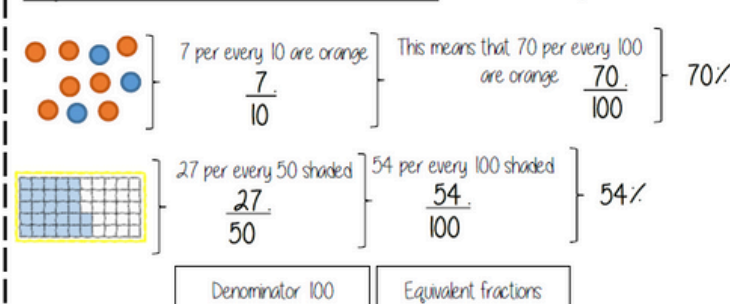
Percentage decrease: Multipliers



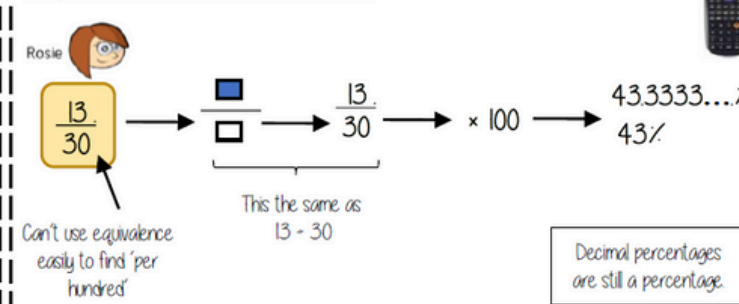
Percentage increase: Multipliers



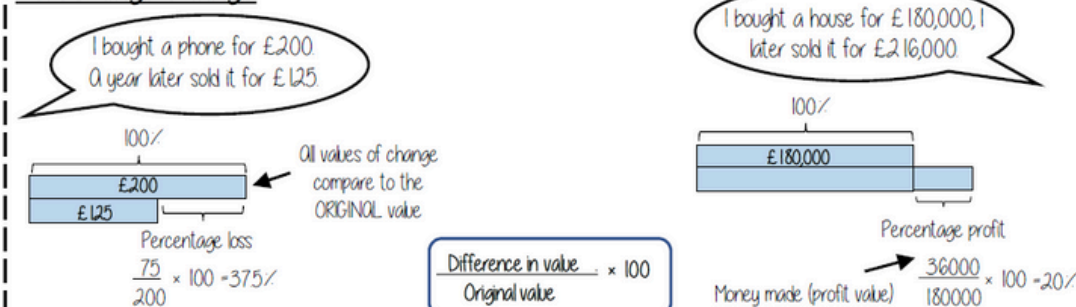
Express as a % - Non-calculator



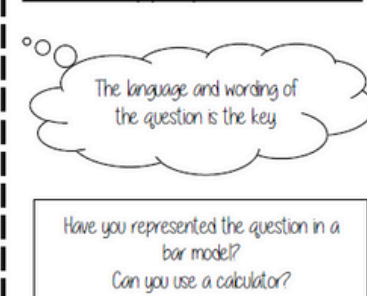
Express as a % - Calculator



Percentage change



Choose appropriate method



YEAR 8 - REASONING WITH GEOMETRY...

Solving ratio & proportion problems

What do I need to be able to do?

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

- Solve problems with direct proportion.
- Use conversion graphs.
- Solve problems with inverse proportion.
- Solve ratio problems.
- Solve 'best buy' problems.

Keywords

Proportion: a comparison between two numbers.

Ratio: a ratio shows the relative size of two variables.

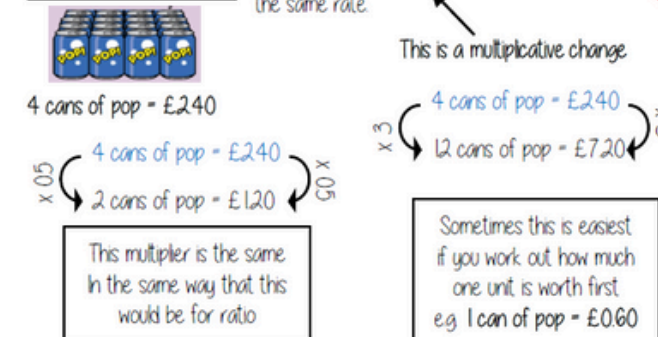
Direct proportion: as one variable is multiplied by a scale factor the other variable is multiplied by the same scale factor.

Inverse proportion: as one variable is multiplied by a scale factor the other is divided by the same scale factor.

Direct Proportion

As one variable changes the other changes at the same rate.

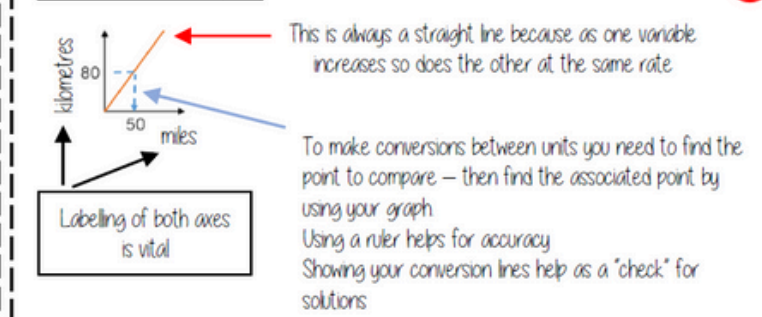
R



Conversion Graphs

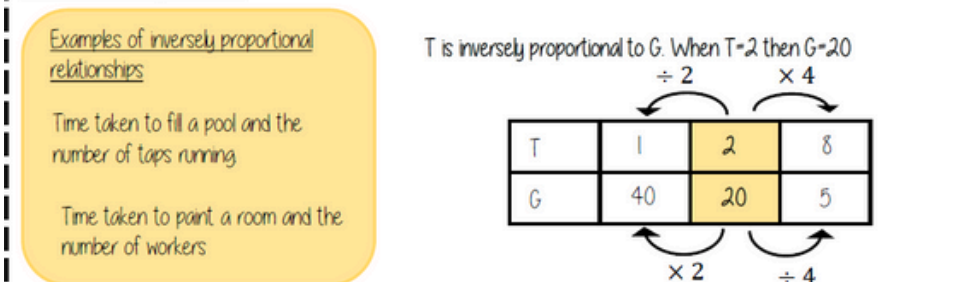
Compare two variables

R



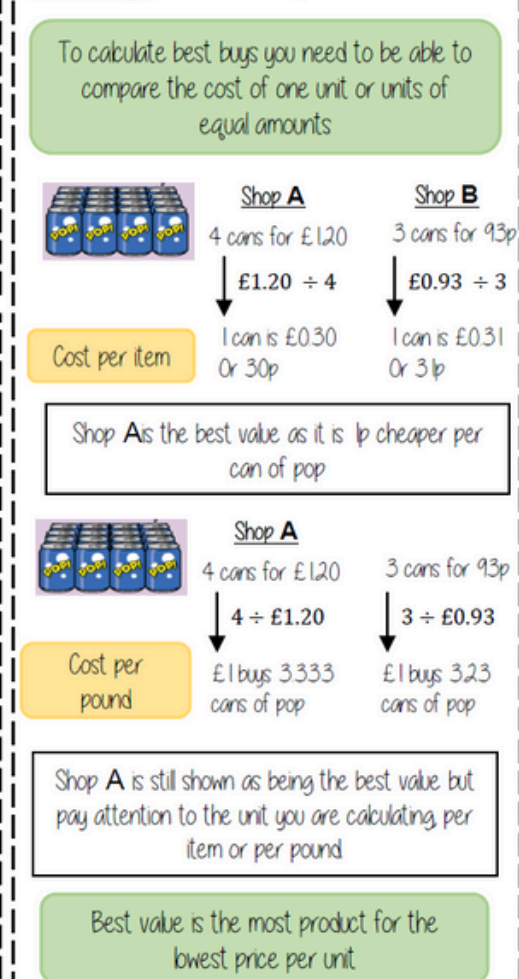
Inverse Proportion

As one variable is multiplied by a scale factor the other is divided by the same scale factor.



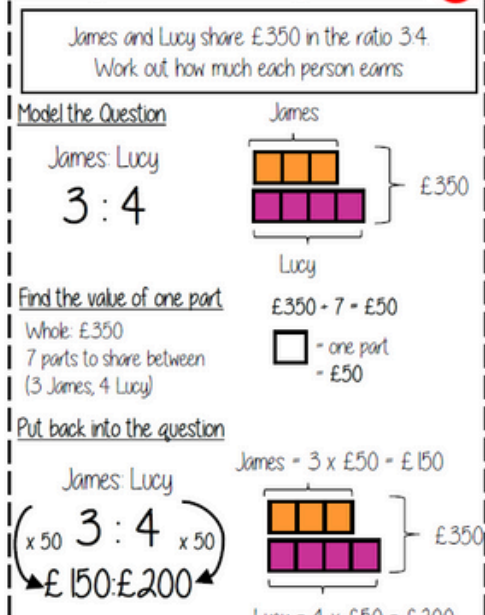
Best Buys

Have a directly proportional relationship



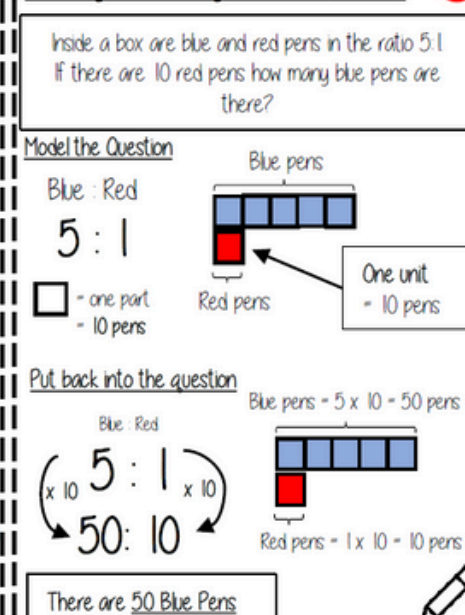
Sharing a whole into a given ratio

R



Finding a value given In (or n:1)

R



YEAR 8 - REASONING WITH DATA...

The data handling cycle

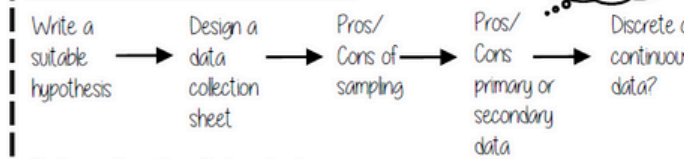
What do I need to be able to do?

- By the end of this unit you should be able to:
- Set up a statistical enquiry
 - Design and criticise questionnaires
 - Draw and interpret multiple bar charts
 - Draw and interpret line graphs
 - Represent and interpret grouped quantitative data
 - Find and interpret the range
 - Compare distributions

Keywords

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

Set up a statistical enquiry



Features of a data collection sheet

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

Design and criticise a questionnaire

The Question - be clear with the question - don't be too leading/ judgemental
 e.g. How much pocket money do you get a week?

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

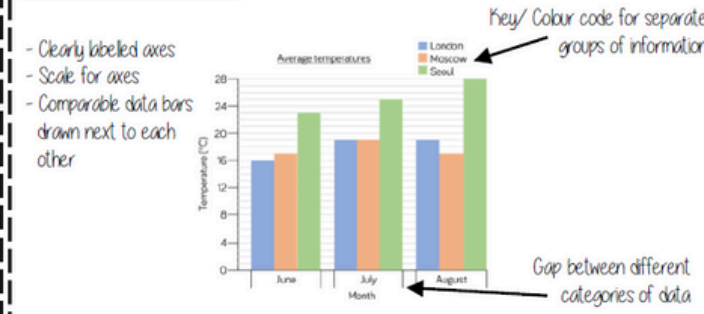
Zero option: £0 £0.01 - £2 £2.01 - £4 more than £4 More option

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

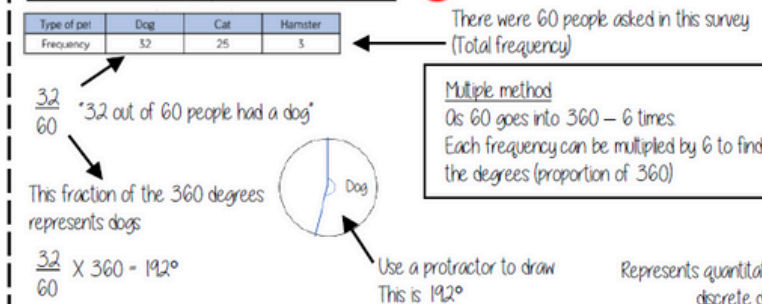
Pictograms, bar and line charts



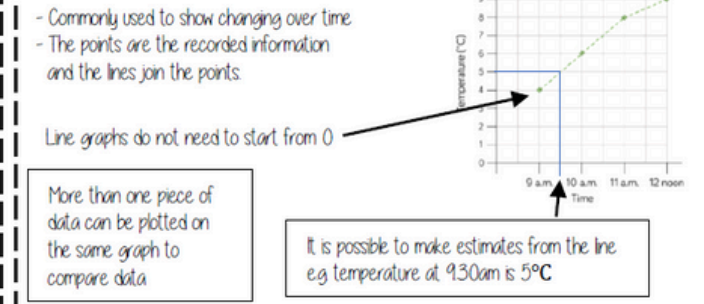
Multiple Bar chart



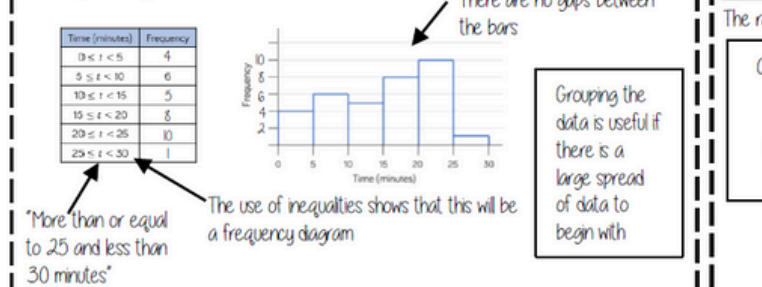
Draw and interpret Pie Charts



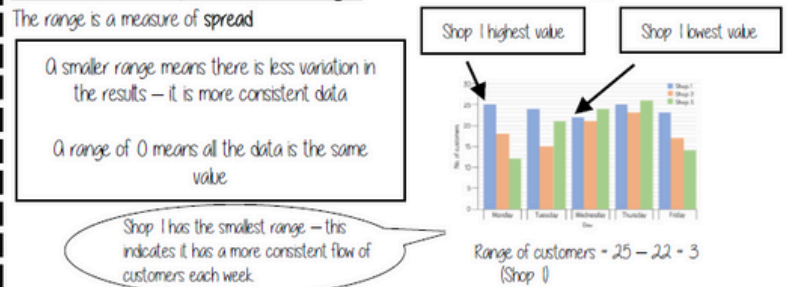
Draw and interpret line graphs



Grouped quantitative data



Find and interpret the range



YEAR 8 - REASONING WITH GEOMETRY...

Pythagoras' theorem

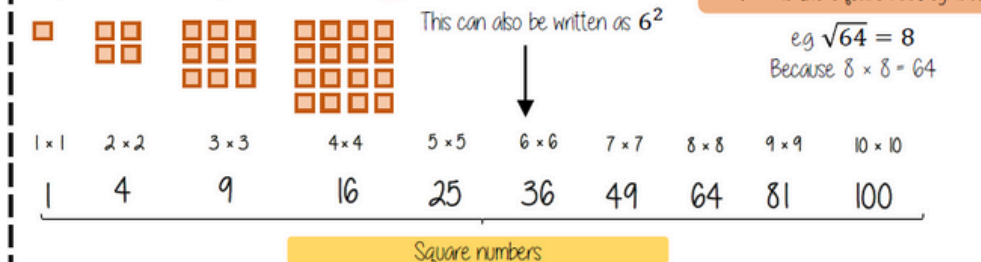
What do I need to be able to do?

- By the end of this unit you should be able to:
- Use square and cube roots
 - Identify the hypotenuse
 - Calculate the hypotenuse
 - Find a missing side in a right angled triangle
 - Use Pythagoras' theorem on axes
 - Explore proofs of Pythagoras' theorem

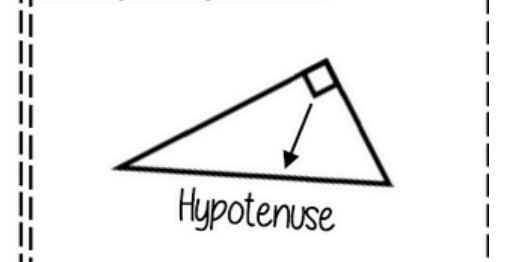
Keywords

Square number: the output of a number multiplied by itself
Square root: a value that can be multiplied by itself to give a square number
Hypotenuse: the largest side on a right angled triangle. Always opposite the right angle.
Opposite: the side opposite the angle of interest
Adjacent: the side next to the angle of interest

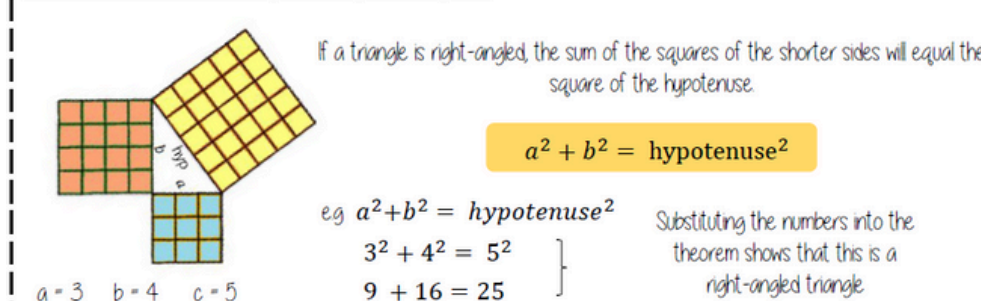
Squares and square roots



Identify the hypotenuse



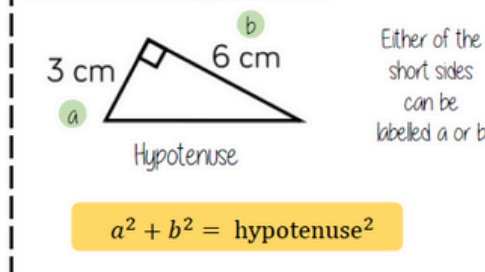
Determine if a triangle is right-angled



The hypotenuse is always the longest side on a triangle because it is opposite the biggest angle

Polygons can still have a hypotenuse if it is split up into triangles and opposite a right angle

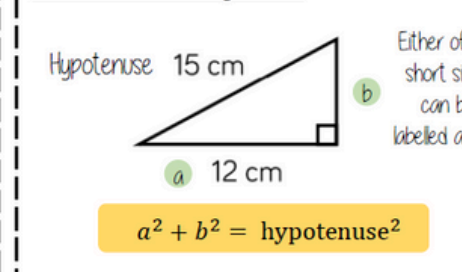
Calculate the hypotenuse



1 Substitute in the values for a and b
 $3^2 + 6^2 = \text{hypotenuse}^2$
 $9 + 36 = \text{hypotenuse}^2$
 $45 = \text{hypotenuse}^2$
 $\sqrt{45} = \text{hypotenuse}$
 $6.71\text{cm} = \text{hypotenuse}$

2 To find the hypotenuse square root the sum of the squares of the shorter sides

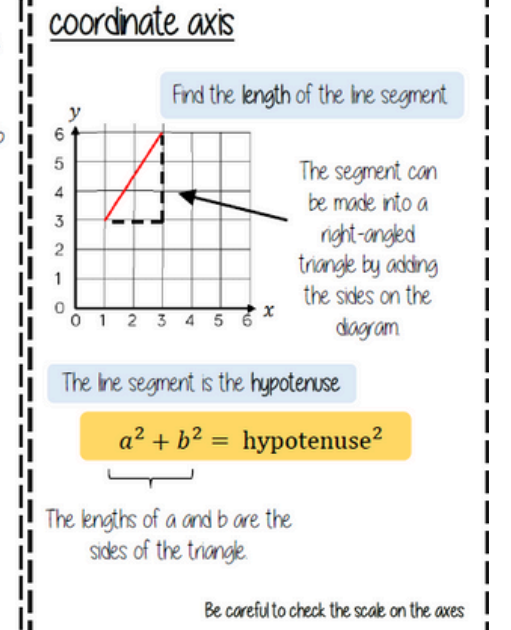
Calculate missing sides



1 Substitute in the values you are given
 $12^2 + b^2 = 15^2$
 $144 + b^2 = 225$
 $-144 \quad -144$
 $b^2 = 111$
 Square root to find the length of the side
 $b = \sqrt{111} = 10.54\text{ cm}$

Rearrange the equation by subtracting the shorter square from the hypotenuse squared

Pythagoras' theorem on a coordinate axis





THS

TIVERTON HIGH SCHOOL

Year 8

Music

Work hard. Be kind. Belong.

Hooks and Riffs

A. Key Words

HOOK – A ‘musical hook’ is usually the ‘catchy bit’ of the song that you will remember. It is often short and used and repeated in different places throughout the piece. HOOKS can either be a:

MELODIC HOOK – a HOOK based on the instruments and the singers

RHYTHMIC HOOK – a HOOK based on the patterns in the drums and bass parts or a

VERBAL/LYRICAL HOOK – a HOOK based on the rhyming and/or repeated words of the chorus.

RIFF – A repeated musical pattern often used in the introduction and instrumental breaks in a song or piece of music. RIFFS can be rhythmic, melodic or lyrical, short and repeated.

OSTINATO – A repeated musical pattern. The same meaning as the word RIFF but used when describing repeated musical patterns in “classical” and some “World” music.

BASS LINE – The lowest pitched part of the music often played on bass instruments such as the bass guitar or double bass. RIFFS are often used in BASS LINES.

MELODY – The main “tune” of a song or piece of music, played higher in pitch than the BASS LINE and it may also contain RIFFS or HOOKS. In “Classical Music”, the melody line is often performed “with” an OSTINATO pattern below.

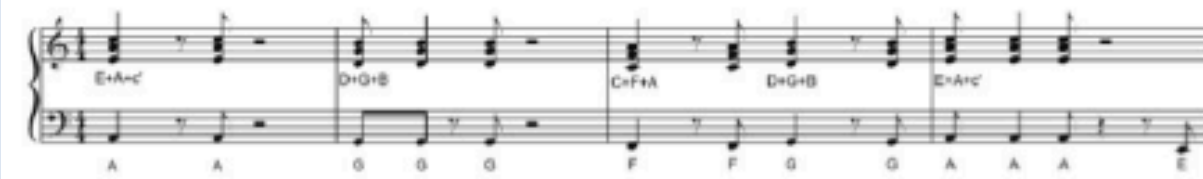
Exploring Repeated Musical Patterns

B. Famous Hooks, Riffs and Ostinatos

Bass Line Riff from “Sweet Dreams” – *The Eurythmics*



Riff from “Word Up” – *Cameo*



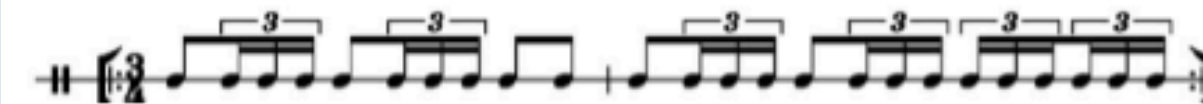
Rhythmic Riff from “We Will Rock You” – *Queen*



Vocal and Melodic Hook from “We Will Rock You” – *Queen*



Rhythmic Ostinato from “Bolero” – *Ravel*



Bass Line Ostinato from “Habanera” from ‘Carmen’ – *Bizet*

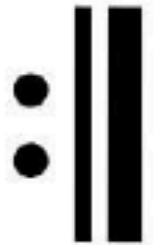


Ostinato from 2nd Movement of Symphony No.101 (The Clock) – *Haydn*



C. Music Theory

REPEAT SYMBOL – A musical symbol used in staff notation consisting of two vertical dots followed by double bar lines showing the performer should go back to either the start of the piece or to the corresponding sign facing the other way and repeat that section of music.



TREBLE CLEF – A musical symbol showing that notes are to be performed at a higher pitch. Also called the G clef since it indicates that the second line up is the note G.



BASS CLEF – A musical symbol showing that notes are to be performed at a lower pitch. The BASS LINE part is often written using the BASS CLEF. Also called the F clef since it indicates that the fourth line up is the note F.



Offbeat *Exploring Reggae and Syncopation*



A. How did Reggae develop?

REGGAE is one of the traditional musical styles from **JAMAICA**. It developed from :

MENTO

A form of Jamaican **FOLK MUSIC** like **CALYPSO** popular in the 1950's.

SKA

Fast dance music that emerged in the 1950's fusing American R&B with MENTO rhythms and featuring **ELECTRIC GUITARS, JAZZY HORN SECTIONS** and characteristic **OFFBEAT RHYTHMS**.

ROCK STEADY

A more vocal style of dance music which used **RIFFS, SIMPLE HARMONIES, OFFBEAT RHYTHMS** and a strong **BASS LINE**.

Reggae was first heard in the UK in the 1950's when immigrants began to settle. During the 1960's, people began importing singles from Jamaica to sell in UK shops. Now, Reggae is known as the national music of Jamaica.

B. Where is Jamaica?



C. What are Reggae Songs About?

Reggae is closely associated with **RASTAFARIANISM** (a religious movement worshipping Haile Selassie as the Messiah and that black people are the chosen people and will eventually return to their African homeland). The **LYRICS** of Reggae songs are strongly influenced by Rastafarianism and are often political including themes such as **LOVE, BROTHERHOOD, PEACE, POVERTY, ANTIRACISM, OPTIMISM** and **FREEDOM**.

D. Offbeat Rhythms & Syncopation

OFFBEAT RHYTHMS – Rhythms that emphasise or stress the **WEAK BEATS OF A BAR**. In music that is in 4/4 time, the first beat of the bar is the strongest, the third the next strongest and the second and fourth are weaker. Emphasising the second and fourth beats of the bar gives a “missing beat feel” to the rhythm and makes the music sound **OFFBEAT**, often emphasised by the **BASS DRUM** or a **RIM SHOT** (hitting the edge of a **SNARE DRUM**) in much Reggae music.

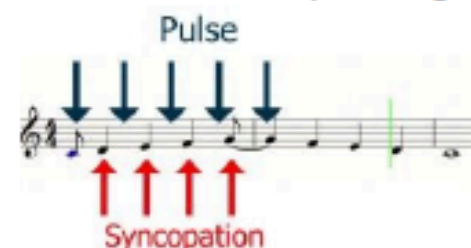
ONBEAT RHYTHM GRID

Pulse/Beat	1	2	3	4	1	2	3	4
“Onbeat” rhythms (strong beats)	♩	♩	♩	♩	♩	♩	♩	♩

OFFBEAT RHYTHM GRID

Pulse/Beat	1	2	3	4	1	2	3	4
“Offbeat” rhythms (weak beats)	♩	♩	♩	♩	♩	♩	♩	♩

SYNCOPATION – A way of changing a rhythm by making



some notes a bit early, often so they cross over the main beat of the music giving the music a further **OFFBEAT**.

E. Musical Features of Reggae

OFFBEAT RHYTHMS AND CHORDS (see D)
SYNCOPATED RHYTHMS AND MELODIES (see D)
SUNG LYRICS (see C)
LEAD SINGER often with **BACKING SINGERS** sometimes singing in **CALL AND RESPONSE** (see F3) accompanied by a Reggae band which often features: **BRASS INSTRUMENTS** and **SAXOPHONES, ELECTRIC GUITARS, BASS GUITAR, KEYBOARDS, DRUMS AND PERCUSSION INSTRUMENTS. VOCAL AND INSTRUMENTAL IMPROVISATIONS** (see F2)

MELODIC RIFFS (see F5)
SLOW, RELAXED (“chilled!”) **TEMPO**
4/4 METRE/TIME SIGNATURE

Most Reggae songs are **POPULAR SONG FORM**.

SIMPLE HARMONIES (see F4)



LYRICS (MELODY)

SYNCOPATED RHYTHMS

RIFFS

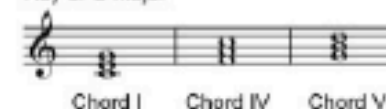
OFFBEAT CHORDS

BASS LINE RIFFS

F. Reggae Key Words

- MELODY** – The main “tune” of a piece of music, often sung by the **LEAD SINGER**.
- IMPROVISATION** – Unprepared performance.
- CALL AND RESPONSE** – Similar to a “Question and Answer”.
- SIMPLE HARMONIES** – using a limited number of **CHORDS**, mainly **PRIMARY TRIADS** such as the **TONIC, DOMINANT** and **SUBDOMINANT** chords.

Key of C major



- RIFF** – A repeated musical pattern. Often the **BASS GUITAR** played repeated **MELODIC BASS RIFFS** in Reggae songs.
- BASS/BASS LINE** – The lowest pitched part of a piece of music often played by the **BASS GUITAR**
- CHORD** – 2 or more notes played together
- RHYTHM** – Long and short sounds.
- TEXTURE** – Combining layers of sound.

G. Who was Bob Marley?

BOB MARLEY was a famous reggae singer, **SONGWRITER**, and musician who first became famous in his band The Wailers, and later as a **SOLO ARTIST**. He was born in 1945 in Nine Mile, Saint Ann, Jamaica. Although he grew up in poverty, he surrounded himself with music and met some of the future members of The Wailers. Bob

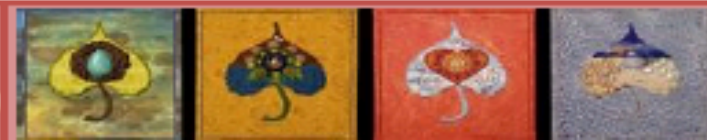


Marley became involved in the Rastafarian movement and this influenced his music style greatly. His career flourished and he became a cultural icon. He

was the first international superstar to have been born in poverty in a Third World country.

VARIATIONS

Exploring musical ideas/ways to develop



A. Theme and Variations Key Words

MELODY – A tune or succession of notes, varying in pitch, that have an organised and recognizable shape. Often called the main **TUNE** or **THEME** of a piece of music or song and easily remembered.

VARIATION – Where a **THEME** is altered or changed musically, while retaining some of the primary elements, notes and structure of the original. **VARIATION FORM:**

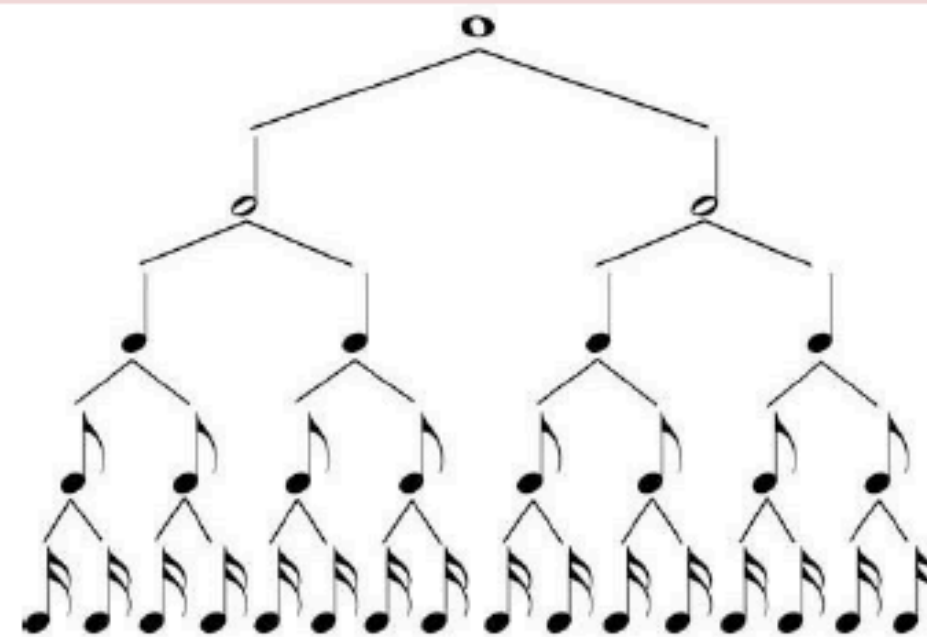


A (Theme) A1 (Variation) A2 (Variation) A3 (Variation) A4 (Variation)

B. Augmentation and Diminution – Note Values and Duration

AUGMENTATION – the process of **DOUBLING** the note values

DIMINUTION – the process of **HALVING** the NOTE values (**DURATION**)



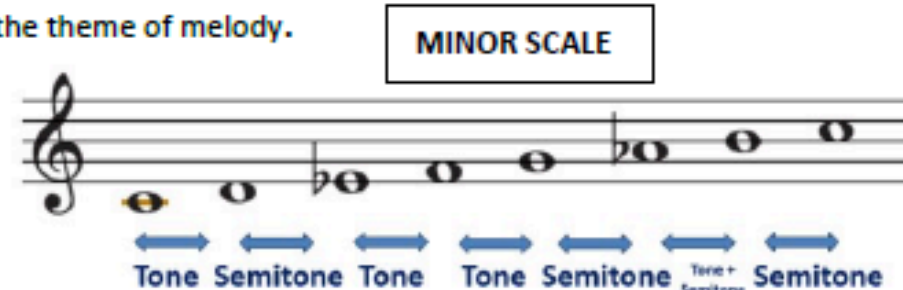
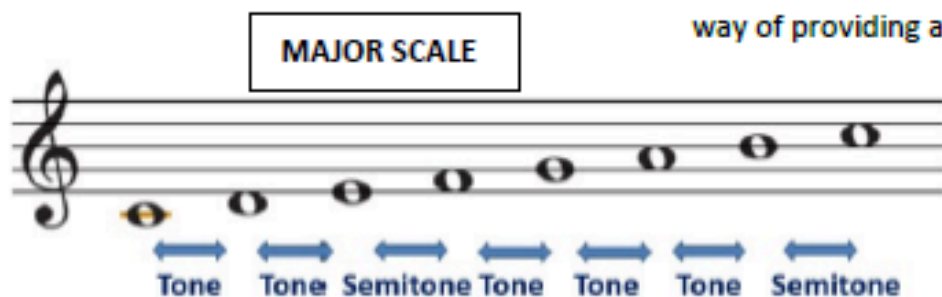
C. Variation Techniques

PITCH – Change the highness or lowness of the theme – <i>e.g. in different OCTAVES</i>	TEMPO Change the speed of the theme.	DYNAMICS Change the volume of the theme. 	TEXTURE Change the amount of sound we hear – play as a SOLO , add an ACCOMPANIMENT or CHORDS , add a COUNTER-MELODY (an 'extra' melody that is played or sung at the same time as the main melody, often higher in pitch and sometimes called a DESCANT). 	TIMBRE AND SONORITY – Change the SOUND of the theme – play it on a different instrument. 	ARTICULATION Change the way the theme is played – smoothly (LEGATO shown by a SLUR) or short, detached and spiky (STACCATO – shown by a dot).	PEDAL A long (often very long!) note in the bass line of the music over which other parts, including the theme or a variation of the theme can be played.	DRONE A long or series of repeated (often long) notes using the TONIC and DOMINANT notes together (a FIFTH).	MELODIC DECORATION Adding extra notes or embellishments to the theme such as trills, turns, mordents (ORNAMENTS) or PASSING NOTES (extra notes between the main melody notes).	OSTINATO Adding a repeated musical pattern (rhythmic or melodic) to the main theme as a form of variation.	CANON/ROUND A song or piece of music in which different performers sing or perform the same THEME starting one after the other. 	GROUND BASS A repeated musical pattern in the bass part 
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D. Tonality – Major and Minor



TONALITY refers to whether a **THEME** or **MELODY** is in a **MAJOR** or **MINOR** key. Changing the tonality from major to minor or minor to major is one way of providing a variation on the theme of melody.



E. Inversion and Retrograde

INVERSION – Changing the **INTERVALS** between notes of a theme so that they are upside down from the original.

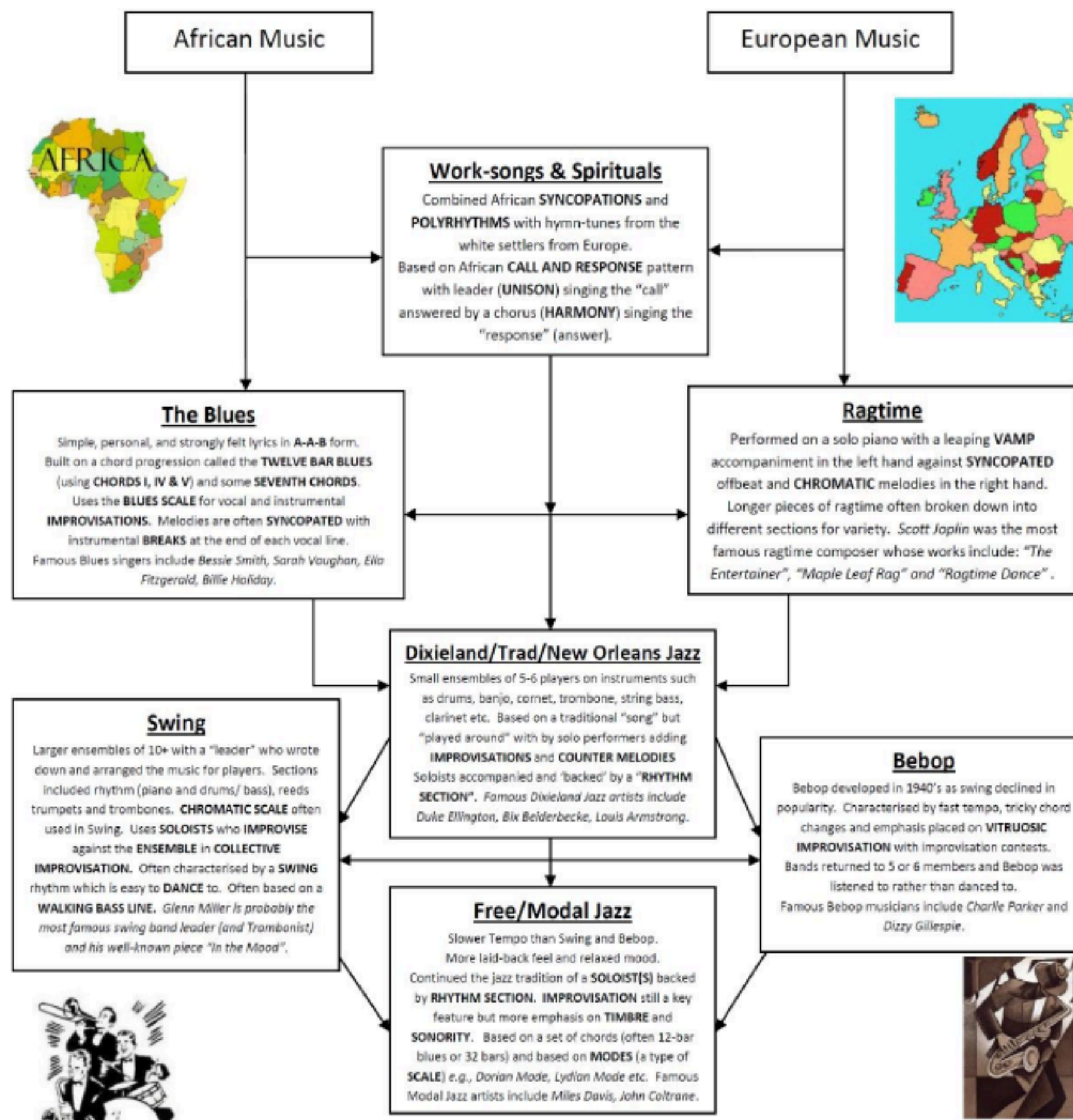
RETROGRADE – Arranging the main theme backwards.

RETROGRADE INVERSION – Arranging the "inverted" variation of the theme backwards!



All That Jazz

Exploring Jazz and The Blues



A. Jazz and Blues Key Words

RIFF/OSTINATO – Short, repeated musical patterns often used in **SOLOS**.

IMPROVISATION – music created 'on the spot' (previously unprepared performance)

SEVENTH CHORD – a **TRIAD** (root, third and fifth) with a fourth note added which is seven notes about the root/tonic. **C7** = C, E, G (triad) + **B flat**.

SWING/SWUNG RHYTHM – performing a regular 'straight' rhythm with a 'lilt' in a "**ONE** and **A**, **TWO** and **A**" style (using **TRIPLETS**) common in swing music.

B. The Twelve Bar Blues

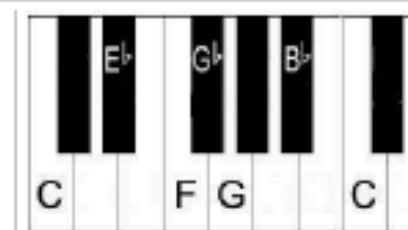
Some or all of these chords can be **SEVENTH CHORDS** (7)

CHORD I	CHORD I	CHORD I	CHORD I
CHORD IV	CHORD IV	CHORD I	CHORD I
CHORD V	CHORD IV	CHORD I	CHORD I

C. The Blues Scale

BLUES SCALE – a series of notes often used within improvisations in blues music (*the Blues Scale on C is shown to the right*).

BLUE NOTES – additional or extra sharpened or flattened notes in a melody.



D. Instruments of Jazz and Blues

Double Bass ("Bass") or "String Bass"

Drum Kit/Drums

Piano

Electric Guitar (or could be Acoustic)

RHYTHM SECTION Accompaniment and Backing

Trumpets

Trombones

Saxophones

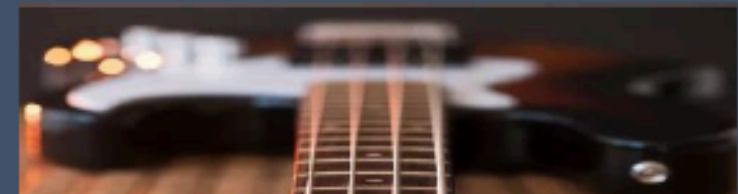
Clarinets

Perform **SOLOS** as well as with the ensemble/band.

FRONTLINE INSTRUMENTS ("REEDS")

ALL ABOUT THE BASS

Exploring Bass Clef Reading and Notation and Bass Line Musical Patterns



A. Bass Clef & Bass Clef Notation

STAFF is the name given to the five lines where musical notes are written.

The position of notes on the stave or staff shows their **PITCH** (how high or low a note is).

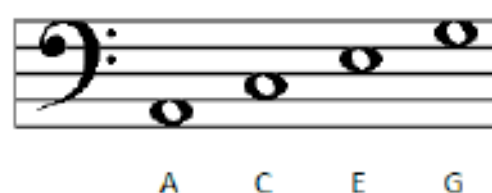
The **BASS CLEF** is a symbol used to show low-pitched notes on the stave and is *usually* used for the left hand on a piano or keyboard to play the **BASS LINE** and also used by low pitched instruments (*see B.*)

The stave or staff is made up of 5 **LINES** and 4 **SPACES**.

Notes on the **LINES** of the **BASS CLEF**: **G, B, D, F, A**
Green Buses Drive Fast Always



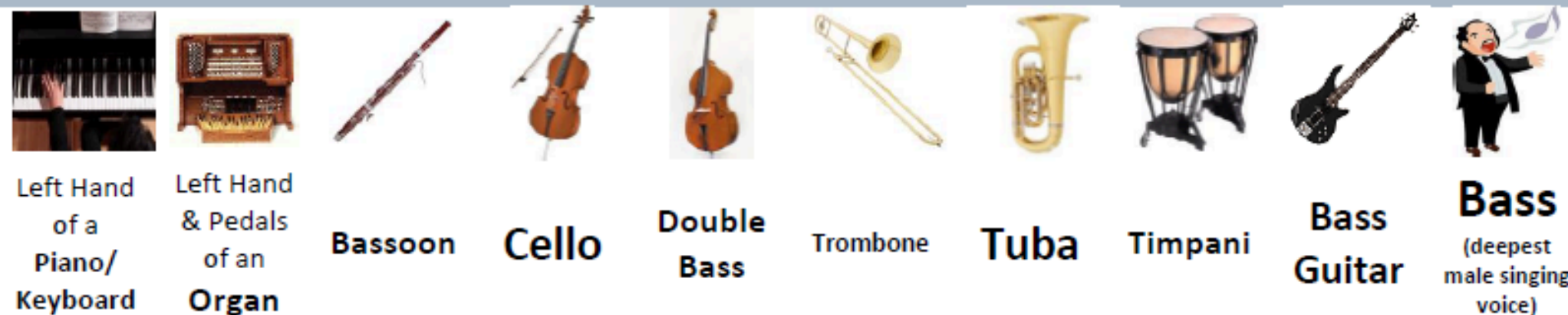
Notes in the **SPACES** of the **BASS CLEF**: **A, C, E, G**
All Cows Eat Grass



Bass Clef **STAFF NOTATION**:



B. Musical Instruments that use the Bass Clef



C. Bass Line Patterns

BASS RIFFS – Short, repeated, ‘catchy’ and memorable Bass Line Patterns used in Rock, Rap, Hip Hop, R’n’B, and Pop songs often performed on Bass Guitar. Bass Riffs ‘fit’ with the notes in the chord, but also use other ‘EXTRA’ notes (**PASSING NOTES**) to make them more memorable.



WALKING BASS – used in Jazz, Blues, Rhythm and Blues, and Rock’n’roll, and featuring **a note on every beat**. Using the **ROOT, THIRD** and **FIFTH** of the chord, and ‘EXTRA’ notes (called **PASSING NOTES**) to create a smooth bass line often moving mainly by step (**CONJUNCT**).



ALBERTI BASS – a type of **ACCOMPANIMENT PATTERN** in the **BASS LINE** using the **ROOT, THIRD** and **FIFTH** notes of a **CHORD** played in a **specific order**:

ROOT	FIFTH	THIRD	FIFTH
Lowest	Highest	Middle	Highest

The pattern repeats, but notes change as chord changes and a melody is added ‘on top’ of the Alberti Bass. Used by Classical composers such as Mozart, especially in solo piano music, as well as modern composers.



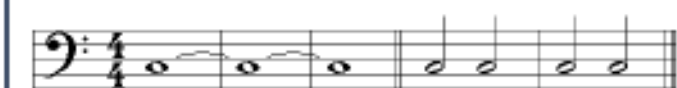
ARPEGGIO: Playing the notes of a chord separately and **in order** *root, third fifth, root, third, fifth etc*, can be ascending (going up) or descending (going down).



BROKEN CHORD – Playing the notes of a chord separately but **not necessarily in strict order** (*e.g., like an Alberti Bass*), often creating a repeated musical pattern, can be ascending (going up) or descending (going down).



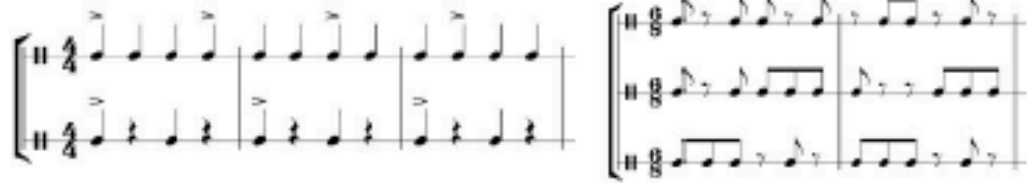
(BASS) PEDAL (POINT/NOTE) – either **SUSTAINED** notes of **LONG DURATION**, or **REPEATED LONG NOTES**, often in **BASS LINE PART**, using the **ROOT** (a **TONIC PEDAL**) or the **FIFTH** (a **DOMINANT PEDAL**). Changing chords, harmonies, and a melody line “fit over the top” of a **PEDAL** note.



SAHARAN SOUNDS

African instruments are often made from plants and animal products such as hide and bone. African musicians are very fond of **PERCUSSION** instruments and use a wide variety of drums (called **MEMBRANOPHONES**) Drums are traditionally used as an accompaniment to singing, dancing, working and communicating between villages. Drummers are typically the most respected members of their community.



Characteristic Rhythms and Metres, Traditional Rhythm Patterns & Repetition and Ostinato		Pitch & Melody and Harmony & Tonality		Ornamentation
REPETITION and CYCLIC RHYTHMS used to organise music. A repeated rhythm pattern (OSTINATO or TIMELINE) is used as a basis for IMPROVISATION. Use of SYNCOPATION, POLYRHYTHMS (shown below right), CYCLIC RHYTHMS and CROSSRHYTHMS (shown below left). 		Most African melodies are based on a "limited number of pitches" - four, five, six or seven note SCALES and are normally short and simple, often expanded by REPETITION and IMPROVISATION. The pitch in African drumming is largely determined by the tuning of the drums. The basic form of African Vocal Music is CHORAL SINGING known as CALL AND RESPONSE where one singer (SOLOIST) or small group of singers sings a line and the whole group (CHORUS) makes a reply (often a fixed REFRAIN) – like a "musical conversation" – in alternation with the "lead singer". The soloist often IMPROVISES. African singing can be accompanied by instruments but can also be unaccompanied (A CAPPELLA).		The MASTER DRUMMER can elaborate and decorate his solo drum part with ACCENTS and playing in a technically demanding style to "show off" to the rest of the drum ensemble and audience.
Texture	Dynamics	Tempo	Ensemble	Form & Structure and
In West Africa, drum ensembles have 3-5 players each with a distinctive method of striking their drum and playing interlocking rhythms. This creates a THICK and complex POLYPHONIC texture.	Since African Drumming is often performed outside and at social gatherings and celebrations, the dynamics are generally LOUD (FORTE – f) or VERY LOUD (FORTISSIMO – ff), but like changes in tempo, can be indicated by the MASTER DRUMMER.	FAST – designed for dancing and social gatherings – tempo will match the dance steps. The MASTER DRUMMER can both establish the tempo as well as speed up (ACCELERANDO) or slow down (DECELERANDO).	A MASTER DRUMMER often leads giving signals to the rest of the group to change rhythms or sections of the piece and can also control the TEMPO.	The structure of a piece of African drumming depends on the MASTER DRUMMER and has no fixed or determined length, entirely dependent on the rhythms used.
Origins and Cultural Context of the Traditional Music	Musical Characteristics of Folk Music	Impact of Modern Technology on Traditional Music	Artists, Bands & Performers of African Drumming	
African Drumming is 'traditional' and handed down via the ORAL TRADITION (not written down). Not performed 'at a concert', rather everyone joins in by dancing or playing an instrument, singing or clapping. Combines other art forms and heard at special occasions and celebrations.	Traditional drums such as the DJEMBE, TALKING DRUM and DUNDUN remain popular in African music today, often combined with a number of percussion instruments, stringed instruments and woodwind instruments. RHYTHM remains a key feature of African drumming.	African music has been a major influence on the development of popular music contributing rhythms, structures, melodic features and the use of improvisation to such styles as blues, gospel and jazz, brought over to America by slaves.	 Bolokada Conde	 Ladysmith Black Mambazo
 TALKING DRUM	DUNDUN 	Instrumentation – Sonorities Other percussion instruments such as clappers, maracas and xylophones produce sound by vibration and are known as IDIOPHONES		 BALAFON MBIRA FLUTE GOURD MARACAS KORA
		Typical Instruments, Timbres and		
		Stringed instruments (CHORDOPHONES) such as bows, lyres and harps and the KORA are popular as well as some woodwind instruments (AEROPHONES) such as whistles, lutes, reed pipes, trumpets and horns		



THS

TIVERTON HIGH SCHOOL

Year 8

PE

Work hard. Be kind. Belong.

Year 8 PHYSICAL EDUCATION

1. Fitness Components		
Component	Definition	How to test
Body Composition	The percentage of a body that is fat, muscle, bone and water.	Skill Fold Callipers
Muscular Strength	The amount of the force muscles can generate against a resistance.	Hand Gip Dynamometer
Muscular Endurance	The ability to use voluntary muscles, over long periods of time without getting tired.	1 minute sit up test or 1 minute press up test
Flexibility	The range of movement at a joint.	Sit and Reach Test
Cardiovascular Fitness (Aerobic Endurance)	The ability of the heart and circulatory system to meet the demands of the body for a long period of time.	12 minute Cooper Run
Coordination	The ability to move two or more body parts at the same time.	Alternate hand wall toss
Reaction Time	The time taken for a response to occur after a stimulus.	Ruler Drop Test
Agility	The ability to change direction at speed.	Illinois Agility Test
Balance	The ability to keep the body steady when in a static position or when moving.	Standing Stork Test
Speed	The time taken to cover a set distance/complete a movement.	30m Sprint Test
Power	The ability to combine speed and strength.	Vertical Jump Test

2. Effects of Exercise
Immediate Effects of Exercise - (during exercise) • hot/sweaty/red skin • increase in depth and frequency of breathing • increased heart rate.
Short Term Effects of Exercise – (up to 36 hours after exercise) • tiredness/fatigue • light headedness • nausea • aching/delayed onset muscle soreness (DOMS)/cramp.
Long Term Effects of Exercise (Months and years of exercising) • body shape may change • improvements in specific components of fitness • build muscle strength • improve muscular endurance • improve speed • improve suppleness • build cardio vascular endurance • improve stamina • increase in the size of the heart (hypertrophy) • lower resting heart rate (bradycardia).

3. Aerobic and Anaerobic
Aerobic and Anaerobic exercise – Two factors determine which method is used: intensity & duration
Anaerobic energy production – takes place in the absence of oxygen $\text{glucose} + \text{oxygen} \rightarrow \text{energy} + \text{carbon dioxide} + \text{water}$
Anaerobic energy production – takes place in the absence of oxygen $\text{glucose} \rightarrow \text{energy} + \text{lactic acid}$





THS

TIVERTON HIGH SCHOOL

Year 8

Religion

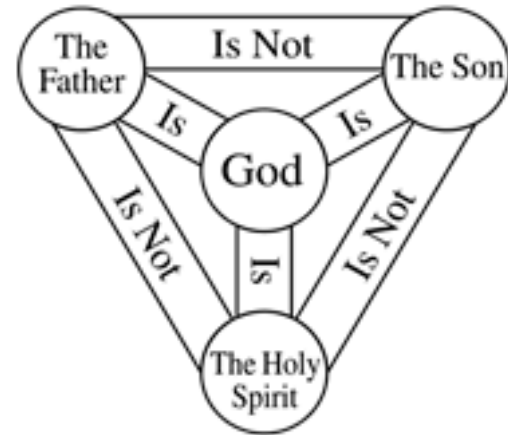
Work hard. Be kind. Belong.

Year 8 Christian Worldview

What does it mean for Christians to believe in God as Trinity?



A) Who and what is God?



- ⇒ Most Christians refer to God as a 'holy trinity', which means God can be recognised as three elements/aspects called The Father, the Son, and the Holy Spirit.
- ⇒ The Nicene Creed explains the nature of The Trinity: the Father is the powerful creator of everything – "Maker of heaven and earth"; the Son is Jesus Christ, who came to Earth as God in human form; the Holy Spirit is the invisible power of God that works within the world today to guide and inspire us.
- ⇒ Christians often use the phrase "In the name of The Father, Son and Holy Spirit" as a blessing to remind them of the three aspects of God.
- ⇒ Christians also describe God as omnipotent (all-powerful) and omnibenevolent (all-loving); as well as transcendent (above and beyond all) and immanent (within and around all).

1. **Trinity**—three as one
2. **Nicene Creed**—statement of beliefs from the Christian church
3. **Omnipotent**—all powerful
4. **Omniscient**—all knowing loving
5. **Transcendent**—above and beyond all
6. **Immanent**—within and around all

B) What's so special about Jesus?



- ⇒ Jesus is referred to as '**God incarnate**' = **God in flesh**. Therefore he is both **human and God**. This is reflected in the quote "**The word became flesh and made his dwelling among us**"
- ⇒ The Gospels of Matthew and Luke's in the Bible detail the key features of his birth, which are: Mary (virgin mother), important visitors (shepherds/wise men), Angel Gabriel, a guiding star, the threat he posed to King Herod.
- ⇒ During his life Jesus shows he is God as he **forgives sins, performs miracles and was resurrected at death**. He shows he is human as he **feels pain, was born to a human mother, and died on the cross**.
- ⇒ From the start of his life Jesus had a **mission**—to **gather followers and guide them back onto the right path**. This is reflected in the quote '**For God so loved the world that he gave his only Son, so that those who believe in him will not perish but have eternal life**' John 3:16.

7. **Jesus**—the 'son' of God; part of the Holy Trinity
8. **Incarnation** — to be born in flesh form
9. **Gospels**—Bible accounts telling the life of Jesus
10. **Martyr**—to die for something you believe in
11. **Pacifist**—a person who is non-violent
12. **Golden Rule**—treat others as you wish to be treated

C) What's so radical about Jesus?



- ⇒ Christianity is represented by the **symbol** of the cross and Christians today wear **crucifix** to remember the **sacrifice** Jesus made and to **inspire them to sacrifice for others** too.
- ⇒ Jesus told his followers that "**I am the way, the truth and the life. No-one comes to the Father except through me**".
- ⇒ Christians are expected to follow the teachings and example of Jesus. Among others they must '**Treat others as you wish to be treated**'. **This is the Golden Rule**.
- ⇒ Jesus was a **pacifist**, which means he did not believe in using violence and would **avoid conflict**. Christians should therefore do the same.
- ⇒ Jesus is called a **martyr** because he died for the benefit of others, this should inspire **Christians to sacrifice** for the benefit of others by giving up their time, money or goods.
- ⇒ Many Christians donate to charities like **Christian Aid, Tearfund and Salvation Army**.

13. **Martyr**—to die for something you believe in
14. **Pacifist**—a person who is non-violent
15. **Golden Rule**—treat others as you wish to be treated



The disciplinary approaches to this unit will be:

Philosophical textual analysis of the Gospels

Theological knowledge of the Holy Trinity, incarnation, mission

Sociological and theological understanding of evangelism

Year 8 Ethics and Morality

Good, bad; right, wrong; how do people decide?



A) What is morality? 	⇒ Morality is what a person, group or society thinks is right/wrong or good/bad. ⇒ Moral influences include: family, friends, education, past experiences, conscience, religious beliefs, culture, media and age. ⇒ Some ethics/morals may only apply to you (e.g. swearing), others may apply to a group of people (e.g. THS school values); others may be universal (e.g. murder). Two types of morality: ⇒ Absolute morality—This means our morality may be fixed, meaning what we think is right/wrong does not change at all. ⇒ Relative Morality—This means our morality is fluid, meaning we may change our mind about whether something is right/wrong according to the situation we are in.	1. Morality — a persons unique understanding of good, bad, right and wrong. 2. Ethics—situations involving a decision between right and wrong/ good and bad. 3. Conscience—a persons inner voice or gut feeling about morality
B) Medical Ethics 	⇒ All religions teach that life is sacred, usually because they believe it is created or sustained by a god. Medical Ethics ⇒ Blood transfusion (taking another persons blood); organ donation (giving away healthy organs to help others) are both supported and challenged by religious teachings. Some religious people claim it is 'playing God' and therefore wrong. Others believe God would want humans to use whatever means necessary to protect and prolong life. ⇒ Jews believe in 'Tikkun Olam' which involves increasing the well-being of human-kind. By helping each other we will in turn help the world. ⇒ Most Humanists/atheists are Utilitarian—which means they believe in 'the greatest good for the greatest number' so live a life where others can flourish.	4. Sanctity of Life — the belief that life is sacred, perhaps because it's God-given. 5. Tikkun Olam—Jewish teaching to protect life 6. Utilitarianism — the moral principle of 'the greatest good for the greatest number'.
C) Environmental Ethics 	Two environmental viewpoints: Stewardship—the belief that humans are meant to be stewards (caretakers) of the earth, therefore humans should do anything they can to reduce harm or damage to the environment. For religious people they believe they are doing this on God's behalf. Dominion—the belief that humans are entitled to use the earth and it's resources no matter the harm or damage it creates. For religious people they may believe that God as given the earth to humans as a gift and for humans to 'rule over'. Animal Rights ⇒ Vivisection is the use of animals for experimental medicines and cosmetics. ⇒ Sports such as horse/dog racing, fishing and hunting is often challenged due to the treatment of the animals. ⇒ Zoos and safaris use animals for entertainment and profit; often the enclosures and treatment of the animals are not considered appropriate. Some people believe these should be banned.	7. Stewardship — the belief that humans are caretakers of the earth. 8. Dominion—the belief that humans are the rulers of the earth. 9. Animal Rights — campaigns designed to stop animal mistreatments and abuse. 10. Vivisection—experimenting on animals for medicines and/or cosmetics.



The disciplinary approaches to this unit will be:

Understanding of the sociological impacts of ethical theories

Theological understanding of religious ethical attitudes

Philosophical knowledge of diverse ethical perspectives

Year 8 Jewish Worldview

How has persecution and conflict impacted Jews?



A) Covenants 	The Abrahamic Covenant ⇒ Abraham was tested by God many times and because of his devotion God made a covenant (agreement) with him. As long as Abraham's descendants remain faithful God promised he would provide: land, a great nation, protection and blessing. The Mosaic Covenant ⇒ Later, a man named Moses saved the enslaved Jewish people from persecution in Egypt when he led them to safety across the Red Sea. After this, God gave Moses a set of 613 rules (mitzvot) which they should live by, including the Ten Commandments. ⇒ God told Moses that as long as his descendants follow the commandments and remain faithful he will continue to bless, protect and provide for them.	1. Covenant—a promise or agreement between God and humans 2. Israelite—ancient term for a Jewish person 3. Mitzvot—set of 613 commandments for Jews to follow
B) Being Jewish 	⇒ Jews are a race of people defined by their resilience in troubled times. They view persecution and adversity as a chance to show God their continued devotion. ⇒ Many Jewish men wear the kippah (male head covering); others wear tefillin (prayer boxes under clothes); most hang mezuzah (prayer box for doorways to Jewish homes). ⇒ Jewish families celebrate Bar Mitzvah (boys aged 13) and Bat Mitzvah (girls aged 12), these are ceremonies to mark a young Jew's transition from childhood to adulthood. Most importantly, they make their promises to live according to the mitzvot (Jewish commandments). ⇒ Passover is a celebration of the story of Moses and the Exodus. During Passover, Jews remember how Moses and their ancestors left slavery behind them.	4. Persecution—abuse of a person or group over a period of time 5. Kippah—head covering worn by Jewish males 6. Tefillin—small leather boxes worn on a Jew's arm and forehead 7. Mitzvah—Jewish ceremony to celebrate adulthood 8. Torah—sacred Jewish text
C) Anti-Semitism 	⇒ Europe has a long history of anti-Semitism, most infamously, Hitler's genocide (mass murder) of nearly 12million Jews and other minority groups during WW2. This is known as the Holocaust. ⇒ After the defeat of Hitler, the United Nations was formed and they wrote the Declaration of Human Rights, which makes it internationally illegal to discriminate against anyone based on their race, gender, religion or sexuality. ⇒ After the Holocaust Jews were also given their own land/state; called Israel. This land was taken from Palestine and has led to fierce conflict in the area since, and is still occurring today. ⇒ Anti-Semitism still exists within society. This means that sometimes Jewish people endure discrimination, violence, intimidation, bullying and abuse as well as having their synagogues vandalised/damaged. All of which is illegal under British and international laws.	9. Anti-Semitism—mistreatment or abuse towards Jewish people 10. Holocaust—mass murder of Jewish people by the Nazi's, during World War 2 11. United Nations—international organisation created to promote peace and equality



The disciplinary approaches to this unit will be:

Historical exploration of ancient Jewish history

Theological knowledge of Abrahamic and Mosaic covenants

Philosophical exploration of the modern Jewish worldview



THS

TIVERTON HIGH SCHOOL

Year 8

Science

Work hard. Be kind. Belong.

Variation

Differences in characteristics are called **variation**.

Inherited variation

Characteristics are passed on from parents to offspring

genetic diseases
eye colour
blood group

Surroundings affects your characteristics

dyed hair
tattoos
accent

Environmental variation

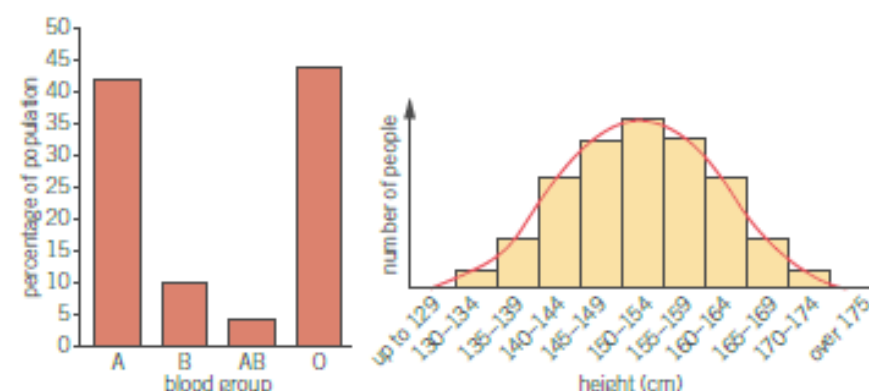
Many characteristics, such as height, are affected by both inherited and environmental variation.

Discontinuous variation

can only result in certain values (e.g., blood group or eye colour)

Continuous variation

can take any value within a range (e.g., height or hair length)



Discontinuous variation should be plotted on a bar chart, and continuous variation should be plotted on a histogram.

Inheritance

Characteristics

Characteristics are inherited from your parents through genetic material stored in the nucleus of cells.

We inherit half of our DNA (deoxyribonucleic acid) from our mother and half from our father.

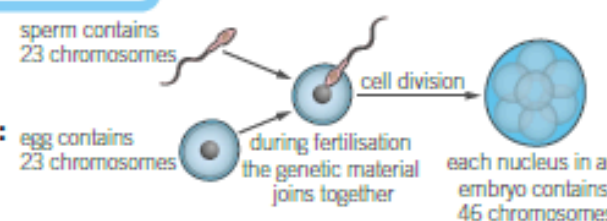


DNA

- contains all the information needed to make an organism
- is arranged into long strands called **chromosomes**.
- each chromosome is divided into sections of DNA
- sections of DNA that contain the information to produce a characteristic are called **genes**

Scientists Watson, Crick, Franklin, and Wilkins, worked together to produce a model of the structure of DNA.

Inheritance of genetic material:



Natural selection

Organisms in a species show variation caused by differences in their genes.

Process of natural selection

- All living organisms have **evolved** from a common ancestor, through the process of natural selection.
- Organisms change slowly over time.
- Those better adapted to their environment are more likely to survive.

Organisms with the most useful characteristics survive and reproduce.

This is called 'survival of the fittest'.

Successful genes are passed on to the offspring.

This is repeated many times and over a long time can lead to a new species.

Adaptation and change

Adaptation

- Adaptations are characteristics that help an organism to survive and reproduce.
- For example, the cheetah is the fastest land animal. This speed makes it a very successful predator.

Competition

Animals compete for: food, water space (for shelter and to hunt), and mates (to reproduce).
Plants compete for: light, water, space, and minerals (plants produce their own food through photosynthesis).

Environmental changes

- Plants and animals adapt to changes in their environments.
- Habitats can change through fire, climate change, or disease causing reduced food supplies.

For example, deciduous trees look different in each season, and bears hibernate somewhere warm in the winter.

Competition and adaption

- Predator and prey species are **interdependent**.
 - This occurs when a change in the population of one animal directly affects the population of the other.
- For example, the number of Canadian lynx and its prey the snowshoe hare.

Extinction

If a species is not well-adapted to its environment it will not survive, and the organisms will die before reproducing. A species becomes **extinct** when there are no more individuals of that species left anywhere in the world. The **fossil record** shows that many species that once lived have become extinct.

Factors leading to extinction:

- changes to the organism's environment
- destruction of their habitat
- new diseases
- new predators
- increased competition.

Scientists are trying to prevent **endangered** species (at risk of extinction) from becoming extinct. For example, by using gene banks to store genetic samples from different species. In the future these can be used for research, or to produce new individuals.



Key terms

Make sure you can write definitions for these key terms.

adaptation competition chromosome continuous characteristic discontinuous DNA inherited variation environmental variation evolution extinct fossil record gene gene bank interdependent natural selection species variation

Atoms

Atoms are incredibly tiny particles that make up all substances. There are 92 types of atom – one for each of the 92 elements that exist naturally. Each type of atom has different properties (e.g., size or mass).

Elements

An **element**:

- cannot be broken down into other substances
- is made of one type of atom only.

Examples of elements include gold, potassium, carbon, and hydrogen.

The names and symbols of all the elements can be found on the **Periodic Table** of elements.

Elements in the Periodic Table are grouped together by their properties, which are different for each element.

1		2																		group number						0			
																											He		
Li	Be																	B	C	N	O	F	Ne						
Na	Mg																	Al	Si	P	S	Cl	Ar						
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr												
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe												
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn												
Fr	Ra	Ac																											

The **chemical symbol** for an element is universal – it is the same in every language, even if the name of the element is different.

Some examples of chemical symbols for common elements are:

hydrogen	H	sulfur	S
carbon	C	sodium	Na
oxygen	O	chlorine	Cl
nitrogen	N	magnesium	Mg

Molecules

A **molecule** is made up of atoms all chemically bonded to each other.

Molecules can be made up from:

several of the same type of atom

for example, oxygen gas
 O_2



two or more types of atoms

for example, sulfur dioxide
 SO_2



Different elements have different masses. So, in a molecule, the different atoms that make it up have different masses.

For example, a molecule of water has two hydrogen atoms and one oxygen atom.

Chemical formulae

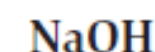
A **chemical formula** tells you how many of each atom there are in a molecule relative to each other.



two hydrogen atoms for every oxygen atom



two chlorine atoms for every one magnesium atom



one sodium atom for every one oxygen atom, and every one hydrogen atom

Compounds

Compounds:

- are made of two or more *different* atoms strongly joined together.
- can be broken down into other substances.

Naming compounds

In a compound made of a metal and a non-metal, the name of the metal comes first.

for example, iron bromide, magnesium fluoride

If the non-metal atom is oxygen, it is called oxide. If the non-metal atom is chlorine, it is called chloride.

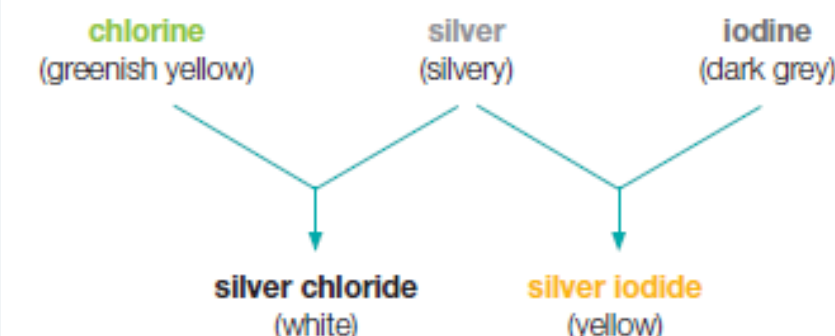
for example, copper oxide, sodium chloride

In a compound made of a non-metal and oxygen, oxygen comes second and is called monoxide if there is one oxygen atom or dioxide for two oxygen atoms.

for example, carbon monoxide, sulfur dioxide

When atoms join together to make a compound, the compound has properties that are different to the properties of the atoms that make them up.

For example, the colours of silver compounds are very different from the colours of the elements that make them up:



Key terms

Make sure you can write definitions for these key terms.

atom

chemical formula

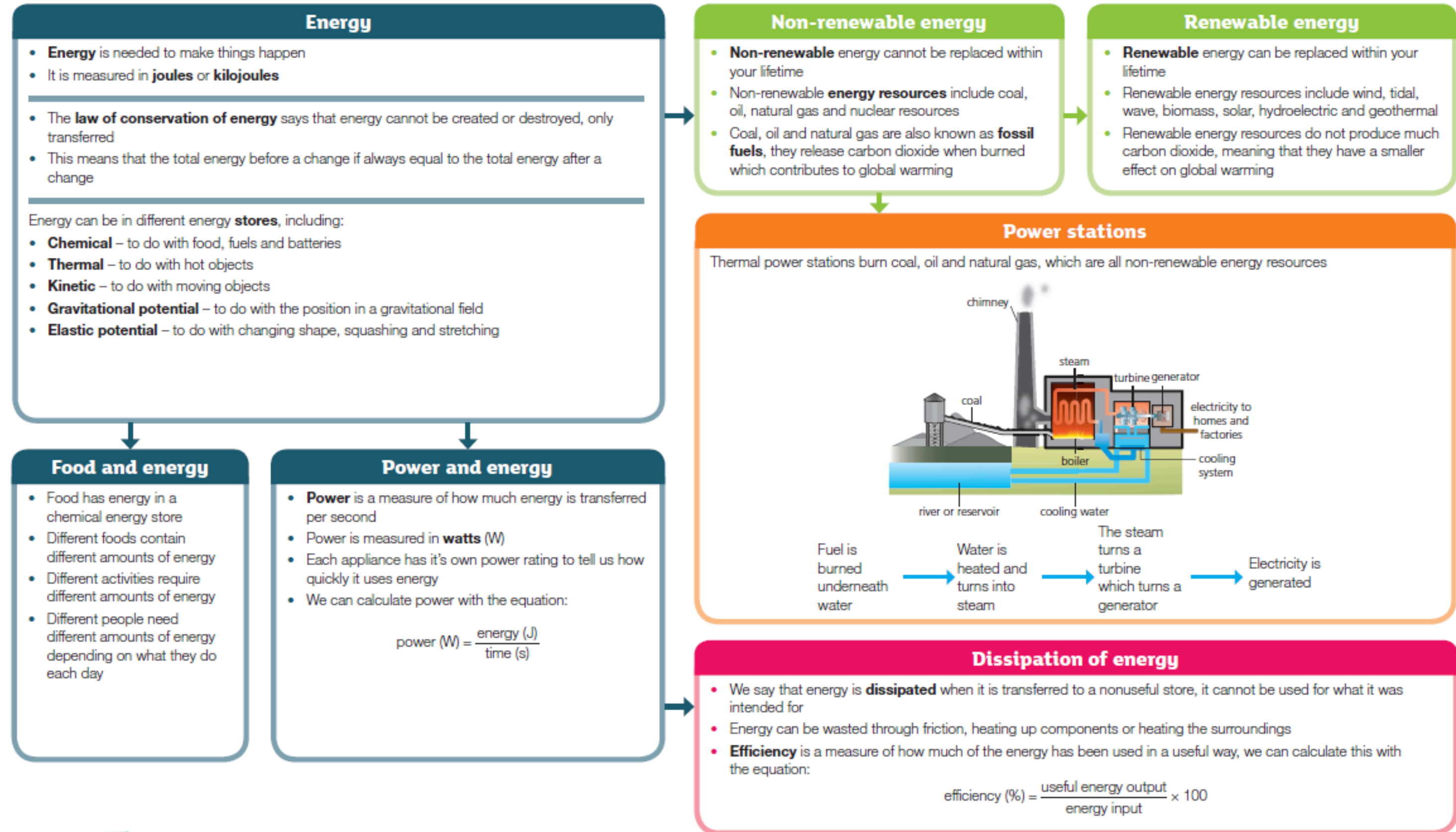
chemical symbol

compound

element

molecule

Periodic Table



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

chemical dissipated efficiency elastic potential energy energy resources fossil fuels gravitational potential joules kinetic kilojoules

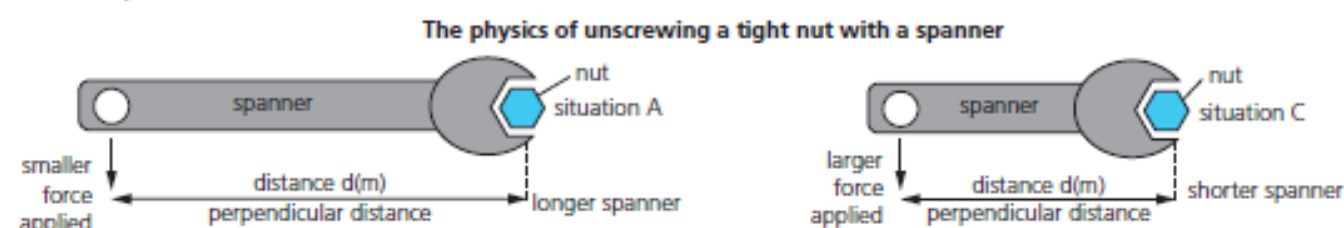
law of conservation of energy non-renewable power renewable thermal watts

Work

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

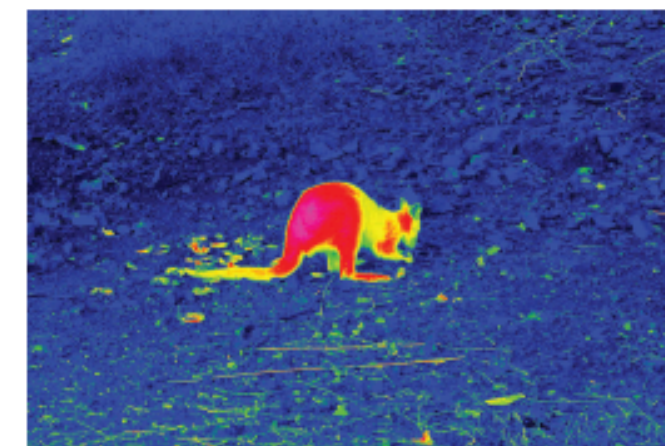
$$\text{work done (J)} = \text{force (N)} \times \text{distance moved (m)}$$

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



Radiation

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

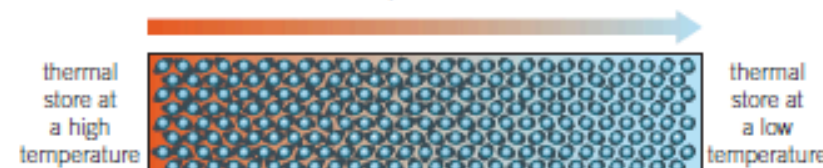


Energy and temperature

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

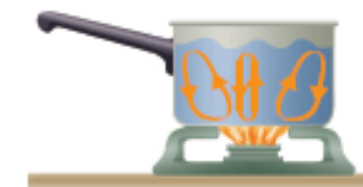
Conduction

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



Convection

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



Key terms

Make sure you can write definitions for these key terms.

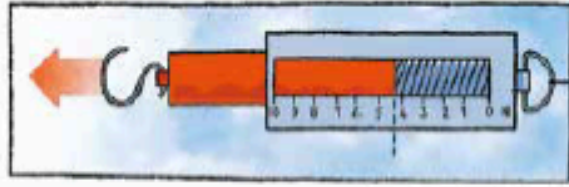
conduction convection convection current force multiplier input force insulator infrared radiation lever output force simple machine temperature
thermometer thermal conductor thermal energy store thermal imaging camera work done

What are forces?

A **force** can be a *push* or a *pull*.

Forces can be measured using a **newtonmeter**.

Forces are measured in **newtons (N)**.



Contact forces occur when objects are touching, for example:

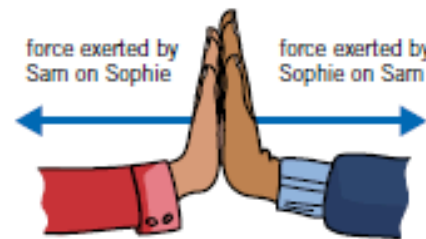
- **friction**
- **drag forces** (air resistance and water resistance)
- support forces (e.g., **reaction forces**)

Non-contact forces work at a distance, for example:

- **gravity**
- **magnetic force**
- **electrostatic force**

Forces always occur in pairs.

The pairs are called **interaction pairs**.



Balanced and unbalanced forces

When the forces acting on an object are the same size, but act in opposite directions, we say that they are **balanced**.

The balanced forces cancel out, and the object is in **equilibrium**.



If the forces are not the same size, and do not cancel each other out, we say they are **unbalanced**.

The larger the difference between unbalanced forces, the quicker the object will change speed.



Drag forces and friction

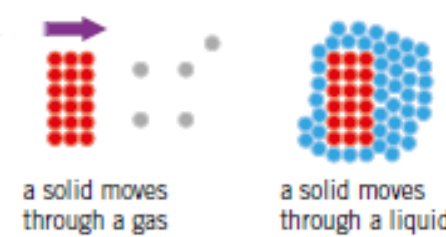
Friction is a contact force that occurs when two objects move against each other. It happens because all surfaces have some roughness – even ones that look smooth.

Friction can be reduced by adding **lubrication** (e.g., oil or grease).

Friction is often useful, for example:

- you need friction to walk across surfaces
- the brakes on a bike need friction to work.

A solid moving through a liquid or a gas has to push the liquid or gas particles out of the way. This produces a drag force on the solid object.



Water resistance and air resistance are drag forces.

Drag forces can be useful if we need to slow something down, for example, by using parachutes.

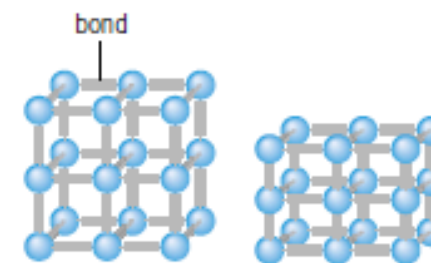
Making an object more **streamlined** will reduce the drag forces on it.

Reaction forces

When you stand on the floor:

- your weight pushes the particles in the floor together
- the bonds between the particles are **compressed**
- the compressed particles push back and support you.

A support force that balances the weight of an object is called the reaction force.
Upthrust is another example of a support force.

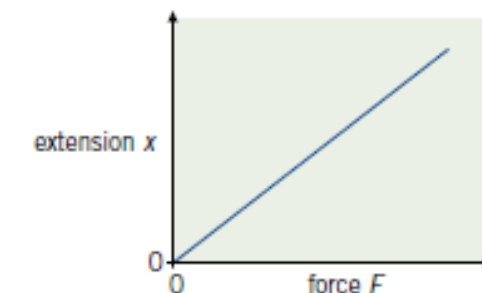


Hooke's law

Some objects – like springs – can be **stretched** when pulled. The amount they stretch by is called the **extension**.

A force called **tension** makes a spring return to its original length (unless it has gone beyond its **elastic limit**).

Hooke's law states that the extension of a spring doubles when you double the force. This means there is a **linear** relationship between force and extension.



Key terms

Make sure you can write definitions for these key terms.

air resistance	balanced	compress	contact force	drag force	elastic limit	electrostatic force	equilibrium	extension	field	friction
gravitational field strength	gravity	Hooke's law	interaction pair	linear	lubrication	magnetic force	mass	newton	newtonmeter	non-contact force
	reaction force	stretch	streamlined	tension	unbalanced	upthrust	water resistance	weight		

C2 Chapter 1: The Periodic Table

Knowledge organiser

The **Periodic Table** displays the names and symbols of all the **elements** we have discovered which are organised by their **chemical properties** and their **physical properties**.

Physical properties

The **physical properties** of an element describe how a substance behaves generally.
(E.g., **conductor** of electricity, **dense**, **conductor of heat**, **shiny**, **malleable**, **sonorous**, **high melting and boiling points**)

Chemical properties

The **chemical properties** of an element describe how a substance behaves in terms of its chemical reactions.
For example, how reactive it is, what other substances it reacts with, and the products it forms in reactions.

metals are to the left of the red line

non-metals are on the right

H

hydrogen

He

helium

Li

lithium

Be

beryllium

Na

sodium

Mg

magnesium

K

potassium

Ca

calcium

Sc

scandium

Ti

titanium

V

vanadium

Cr

chromium

Mn

manganese

Fe

iron

Co

cobalt

Ni

nickel

Cu

copper

Zn

zinc

Ga

gallium

Ge

germanium

As

arsenic

Se

selenium

Br

bromine

Kr

krypton

Rb

rubidium

Sr

strontium

Y

yttrium

Zr

zirconium

Nb

niobium

Mo

molybdenum

Tc

technetium

Ru

ruthenium

Rh

rhodium

Pd

palladium

Ag

silver

Cd

cadmium

In

indium

Sn

tin

Sb

antimony

Te

tellurium

I

iodine

Xe

xenon

Cs

caesium

Ba

barium

La

lanthanum

Hf

hafnium

Ta

tantalum

W

tungsten

Re

rhenium

Os

osmium

Ir

iridium

Pt

platinum

Au

gold

Hg

mercury

Tl

thallium

Pb

lead

Bi

bismuth

Po

polonium

At

astatine

Rn

radon

Fr

francium

Ra

radium

metals

non-metals

solids

liquids

gases at room temprature

This version of the Periodic Table does not include every discovered element.

Metals

normally good conductors of heat and electricity

shiny when cut

malleable

dense and sonorous

most have high melting points

Group 1

called the alkali metals

like all other metals but are very reactive

Metals

- normally good conductors of heat and electricity
- shiny when cut
- malleable
- dense** and **sonorous**
- most have high melting points

Group 1

- called the **alkali metals**
- like all other metals but are very **reactive**
- react vigorously (strongly) with water
- get more reactive as you go down the group
- lower melting points than most other metals
- melting points decrease down the group
- always produce a metal hydroxide and hydrogen gas when reacted with water

Group 7

- called the **halogens**
- generally very reactive
- generally the opposite of Group 1
- melting point increases down the group while reactivity decreases.
- take part in **displacement reactions**, where an element from higher up the group takes the place of one from lower down the group in a compound.

For example: $\text{potassium iodide} + \text{chlorine} \rightarrow \text{potassium chloride} + \text{iodine}$

Non-metals

- often have properties the opposite of metals
- low boiling points, so are gases at room temperature
- poor conductors of electricity and heat
- dull in appearance
- low density
- brittle** and not sonorous

Group 0

- called the **noble gases**
- very unreactive
- low boiling points, so are gases at room temperature
- like the halogens, their boiling points increase down the group



Key terms

Make sure you can write definitions for these key terms.

alkali metal brittle conductor chemical property dense displacement reaction element group halogen malleable metal noble gas non-metal
period Periodic Table physical property sonorous reactive

Chemical reactions

- A **chemical** reaction is a change in which atoms are rearranged to make new substances
- A **reversible** reaction is one where the products can react to get back the substances which you started with, most chemical reactions are not reversible
- You can look for signs that a chemical reaction has taken place such as flames, smells, heat change, a loud bang or gentle fizz

Acids and alkalis

- Acids** and **alkalis** are the chemical opposites of one another
- Both acids and alkalis can be **corrosive** and **irritants**

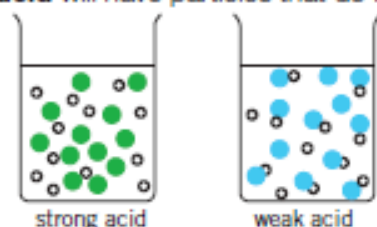
To see whether a substance is an acid or an alkali, we can use an **indicator**. Indicators show how acidic or how alkaline a solution is by showing its position on the **pH scale**, one example of this is **universal indicator**

- If the solution has a pH value of 1–6 it is **acidic**
- If the solution has a pH value of 8–14 it is **alkaline**
- If the solution has a pH value of 7 it is known as **neutral**

Strong acid			Weak acid			Neutral		Weak alkali		Strong alkali			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
sulfuric acid, nitric acid, hydrochloric acid	lemon juice, cola drinks	vinegar		saliva, tea		water, blood (7.4)		toothpaste, milk of magnesia				drain cleaner	sodium hydroxide, potassium hydroxide

Acid strength

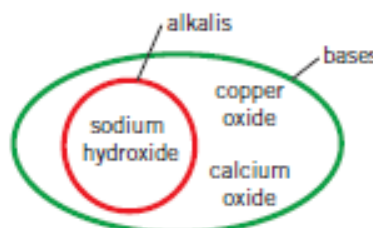
- The strength of an acid depends on how much of the acid has broken apart when it has dissolved in water
- Hydrogen chloride dissolves in water to form hydrochloric acid, this is a **strong acid** as all of the particles split up
- A **weak acid** will have particles that do not all split up



- The **concentration** of the acid is the amount of acid which has dissolved in 1 litre of water
- The more concentrated the acid, the lower the pH

Neutralisation

- Neutralisation** reactions are any reaction in which acids react with a **base** to cancel out the effect of the acid
- These reactions form a neutral solution with a pH of seven
- A **base** is any substance which neutralises an acid
- An **alkali** is a base which has been dissolved in water

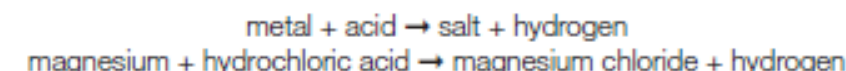


Salts

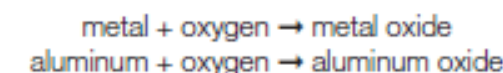
- Salts** are substances which are formed when an acid reacts with a metal or metal compound
- Different acids form different types of salts:
 - Hydrochloric acids form chloride
 - Sulphuric acids form sulphates
 - Nitric acids form nitrates

Metal reactions

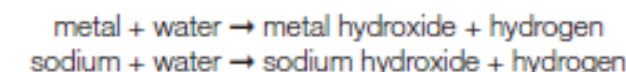
When a metal reacts with an acid it will produce a salt and hydrogen gas, the fizzing that you see is the hydrogen gas being given off



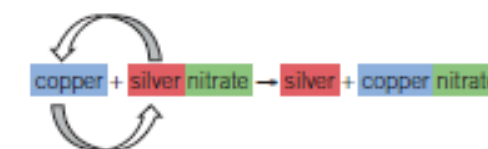
When a metal reacts with oxygen a metal **oxide** is formed, this process is known as **oxidation**



- When a metal reacts with water it forms a metal **hydroxide** and hydrogen gas.
- The alkali (group 1) metals react most vigorously, giving off a brightly coloured flame



When a more reactive metal reacts with a compound containing a less reactive metal, it can take its place, this is known as a **displacement** reaction



- If the metal on its own is higher in the **reactivity series** than the metal in the compound a reaction will take place
- If the metal on its own is lower in the reactivity series than the metal in the compound, a reaction will not take place

The reactivity series

- The **reactivity series** describes how reactive different metals are compared to one another
- The higher the metal is in the reactivity series the more reactive it will be this means that it will react much more vigorously



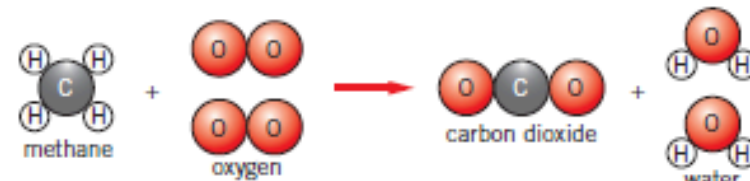
Key terms

Make sure you can write definitions for these key terms.

acid acidic alkali alkaline base chemical chemical reaction concentration concentrated corrosive displacement hydroxide indicator irritant neutral
neutralisation oxide oxidation pH scale reversible reactivity reactivity series salt strong acid universal indicator weak acid

Chemical reactions

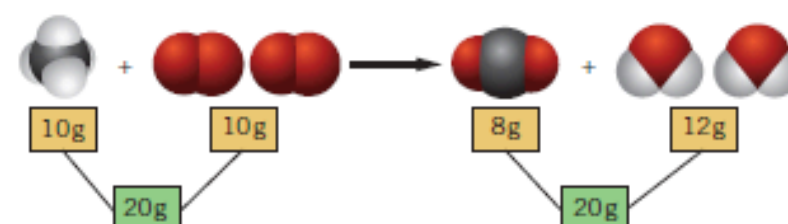
- Word equations can represent a **chemical reaction**:



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

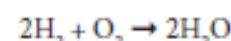
Conservation of mass

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



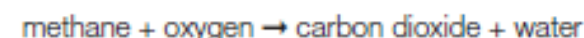
Balanced symbol equations show the amounts of all of the individual atoms in a reaction

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

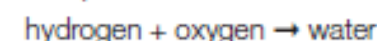


Combustion

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

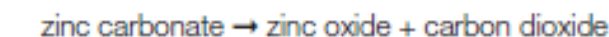


- Hydrogen can also be used as a fuel, this is much better than traditional fossil fuels as it does not produce carbon dioxide:

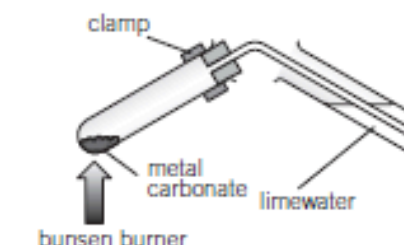


Thermal decomposition

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



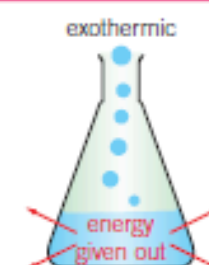
- We can test for this carbon dioxide by bubbling the gas through limewater, if the limewater turns cloudy, the gas is carbon dioxide



Exothermic and endothermic reactions

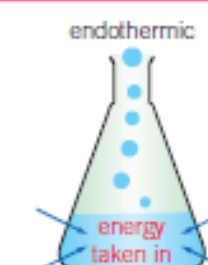
Exothermic reactions involve a transfer of energy from the reactants to the surroundings

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



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

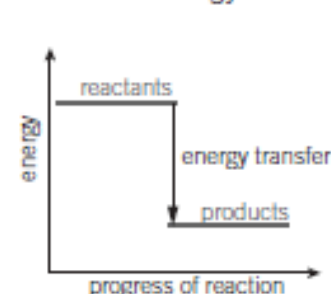
- As energy is taken into the reactants a decrease in temperature will be shown
- Examples of endothermic reactions include thermal decomposition, melting, and boiling



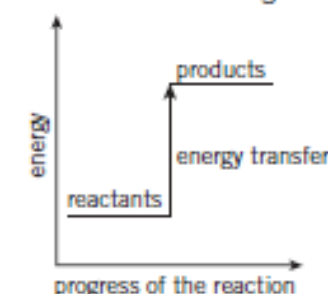
Energy level diagrams

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

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



Exothermic



Endothermic

Bond energies

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

Key terms

Make sure you can write definitions for these key terms.

balanced symbol equation

chemical bond

chemical reaction

combustion

conserved

conservation of mass

decomposition

fuel

endothermic

energy level diagram

exothermic

products

reactants

thermal decomposition

Human reproduction

Adolescence

The time during which you change from being a child to being an adult is called **adolescence**. The physical changes that happen between the ages of 9–14 are called **puberty**.

These changes include:

Girls

breasts develop, ovaries start to release egg cells, periods start, hips widen,

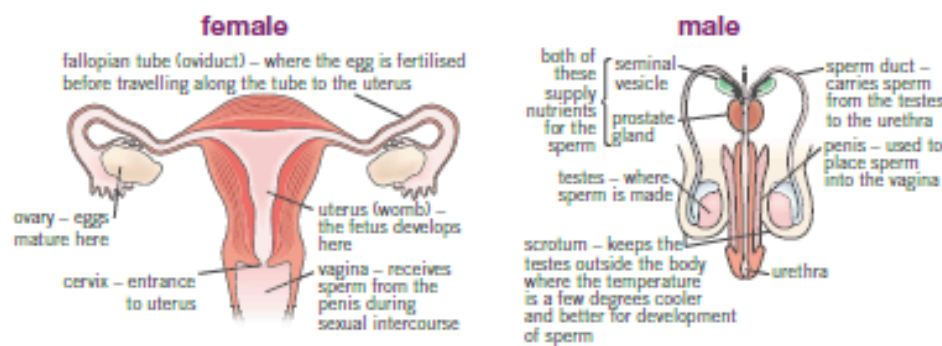
pubic

and underarm hair grows, body odour develops, emotional changes, growth spurt

Boys

voice breaks, sexual organs develop, testes start to produce sperm, shoulders widen, hair grows on face and chest

Reproductive systems



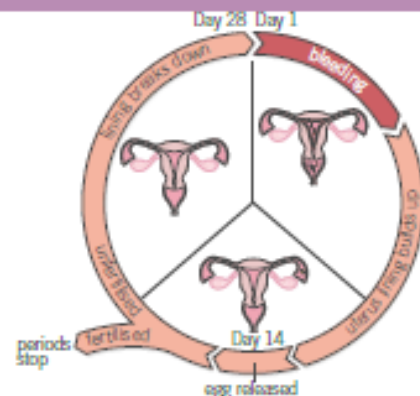
The menstrual cycle

Day 1 – blood from uterus lining leaves the body through the vagina.

Day 5 – bleeding stops. Uterus lining begins to re-grow.

Day 14 – an egg cell is released from one of the ovaries (**ovulation**).

The egg cell travels through the oviduct towards the uterus.



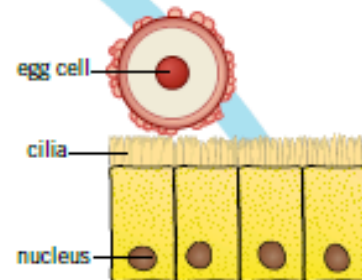
Methods of contraception

Condoms – A thin layer of latex rubber that prevents semen being released into the vagina.

Contraceptive pill – a daily tablet that contains hormones. It prevents pregnancy by stopping ovulation.

Fertilisation

An egg is released every month.



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

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)

the main steps in a baby's development (**gestation**) during pregnancy

just a dot	•	1 week – cells beginning to specialise
3 mm long		4 weeks – spine and brain forming, heart beating
3 cm long		9 weeks – tiny movements, lips and cheeks sense touch, eyes and ears forming
7 cm long		12 weeks – fetus uses its muscles to kick, suck, swallow, and practise breathing

There are three important structures in the uterus during gestation:

placenta – where substances pass from mother to **fetus**

umbilical cord – connects the fetus to the placenta

fluid sac – shock absorber that protects the baby.

Plant reproduction

Parts of a flower



Stamen

male part of the flower

- the **anther** produces pollen
- the **filament** holds up the anther

Carpel

female part of the flower

- the **stigma** is sticky to catch grains of pollen
- the **style** holds up the stigma
- the ovary contains **ovules**

Pollination

Pollination is the fertilisation of the ovule, which occurs when pollen is transferred from an anther to the stigma. Pollination can occur due to insects or the wind.

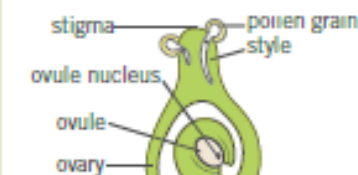
cross-pollination

between two **different** plants

self-pollination

between the male and female parts of the **same** plant

Fertilisation



The tube grows out of the pollen grain and down through the style.

The pollen nucleus moves down the tube.

The pollen nucleus joins with the ovule nucleus. Fertilisation takes place and a seed will form.

Germination

When a seed starts to grow it is called **germination**.

To germinate, seeds need:

- water – for the seed to swell and the embryo to start growing
- oxygen – for respiration and transferring energy for germination
- warmth – to help speed up the reactions in the plant.

Key terms

Make sure you can write definitions for these key terms.

adolescence anther carpel cervix cilia contraception ejaculation embryo fertilisation fetus filament gestation germination implant menstrual cycle ovary
oviduct ovulation ovule placenta pollen pollination puberty semen sperm duct stamen stigma style testes umbilical cord uterus urethra vagina

Space

A **galaxy** is a collection of billions of **stars**. The Earth is in the **Milky Way** galaxy.

Planets are large objects that **orbit** stars, and do not **produce** light.

Asteroids are rocky objects smaller than planets, that also orbit stars.

Satellites are objects that orbit planets. This includes **natural satellites** (moons) and **artificial satellites** (e.g., the International Space Station).

Meteors are bits of rock which burn up in Earth's atmosphere. They are called **meteorites** once they hit the ground.

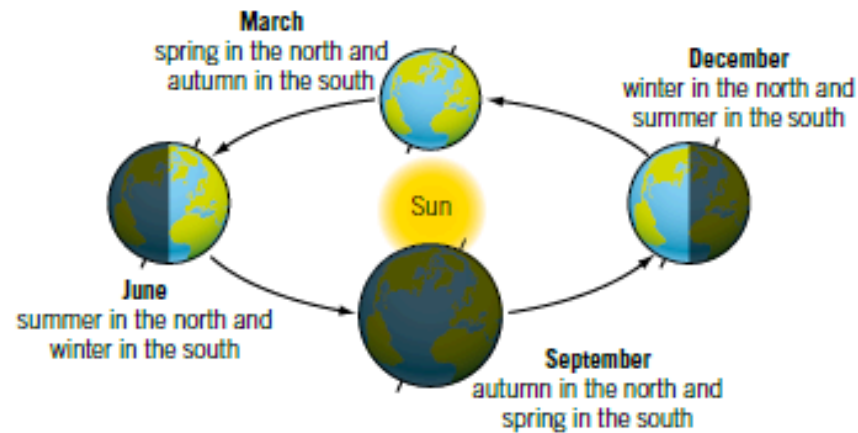


The Earth

The Earth is the only place we have found life in the **Universe**.

It takes a year for the Earth to orbit the **Sun** - 365.2442 days. We add one day every fourth year (a leap year) because of the extra 0.2442 days.

The Earth's **axis** is tilted 23.4 degrees, which causes seasons (which have different day lengths and temperatures).

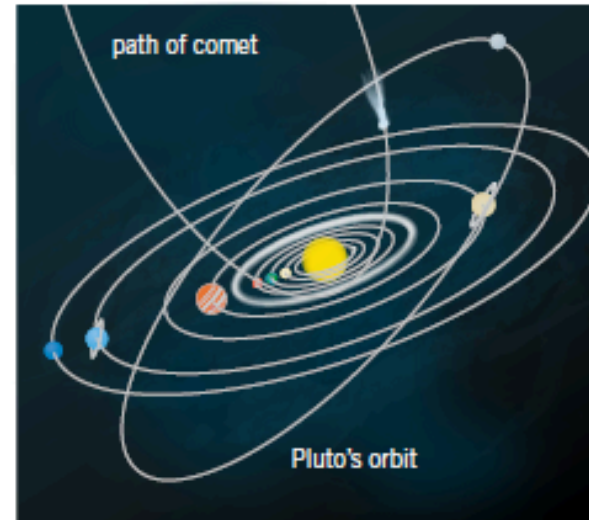


The Earth spins on its axis every 24 hours, giving us day and night.

The Solar System

Our **Solar System** is everything that orbits around the Sun. This includes:

- **Inner planets** – the **terrestrial** (rocky) planets
Mercury Venus
Earth Mars
- Asteroid belt (including the **dwarf planet** Ceres)
- **Outer planets** – the **gas giants**
Jupiter Saturn
Uranus Neptune
- Kuiper belt objects (such as Pluto)
- **Comets** (balls of ice)



The further a planet is from the Sun, the colder its temperature is (apart from Venus, because of its thick atmosphere).

Gravity pulled gas and dust together to form the Sun about 5 billion years ago. The planets then formed from a spinning disc of gas and dust around the Sun.

An **exoplanet** is a planet that is orbiting a star that is not the Sun.

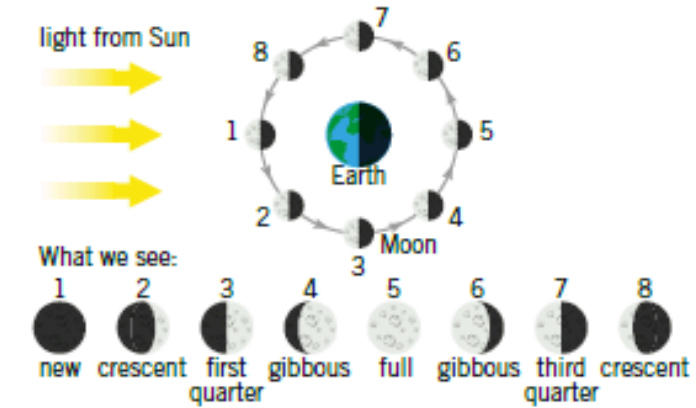
The Moon

The **Moon** orbits the Earth every 27 days and 7 hours.

It takes the same amount of time to spin on its axis, so we always see the same side.

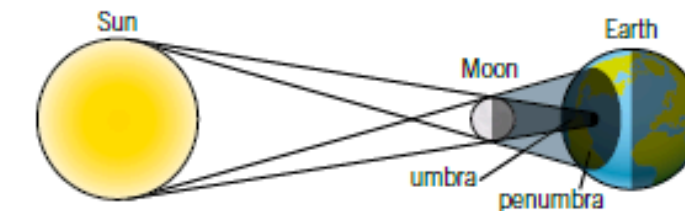
Phases of the moon

As the Moon moves around the Earth different parts are lit by the Sun, so it looks different to us.



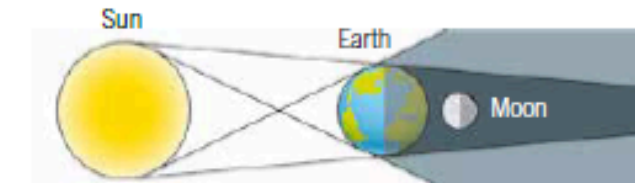
Solar eclipses

The Moon blocks light hitting part of the Earth. The **umbra** is the region of total darkness (like night), and the **penumbra** is where the light is partially blocked.



Lunar eclipses

The earth stops light hitting the Moon.



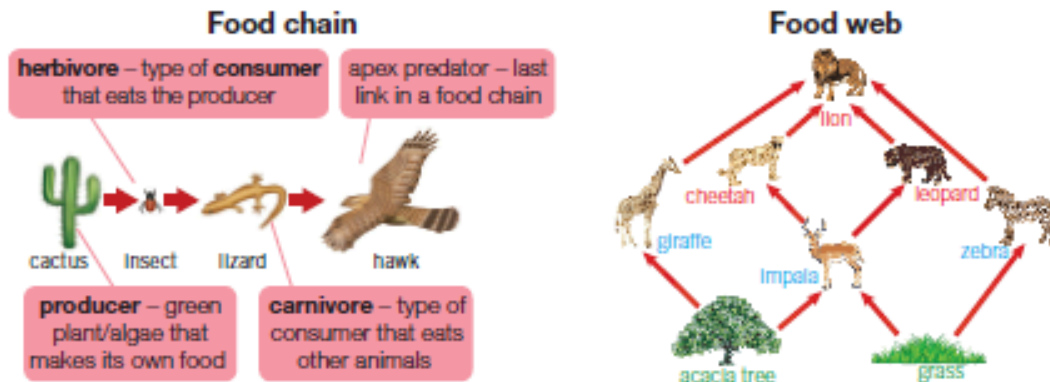
Key terms

Make sure you can write definitions for these key terms.

artificial satellite asteroid axis comet dwarf planet exoplanet galaxy gravity gas giant inner planet lunar eclipse meteor meteorite Milky Way
Moon natural satellite orbit outer planet penumbra planet solar eclipse Solar System star Sun terrestrial umbra Universe

Food chains and webs

- **Food chains** show the direction in which energy flows when one organism eats another
- The direction of the arrows represent the direction in which the energy flows
- **Food webs** show how a number of different food chains are connected



- **Producers** are the organisms which start the food chain, they convert energy from the Sun, making their own food, these are often plants
- **Prey** are organisms which are eaten by other organisms
- **Predators** are the organisms which eat the prey

Disruption to food chains

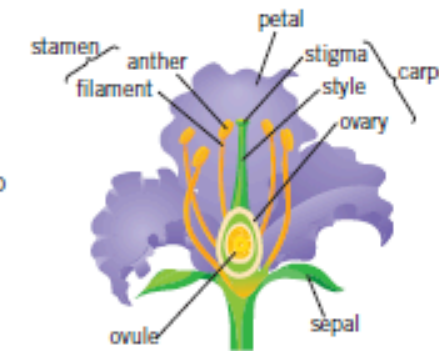
- **Interdependence** is the way in which living organisms rely on each other to survive
- A food chain will be disrupted if one of the organisms die out
- If the producer dies out the rest of the food chain will also die out unless they have a different food source
- If the **consumer** population die out the number of organisms which they eat will increase unless they are eaten by another organism
- **Bioaccumulation** is the process by which chemicals such as pesticides and insecticides build up along a food chain

Parts of a flower

Stamen

Male part of the flower

- The **anther** produces **pollen**
- The **filament** holds up the anther



Carpel

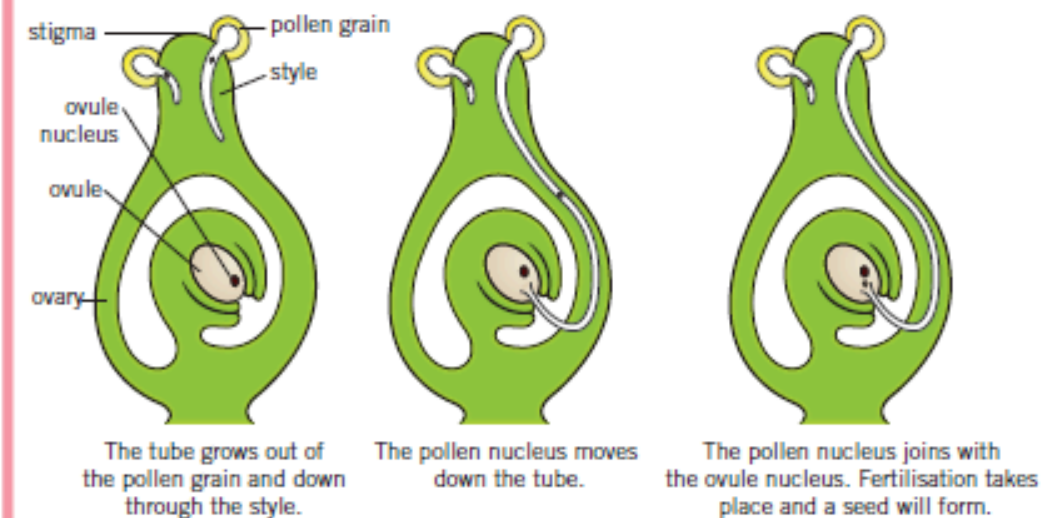
Female part of the flower

- The **stigma** is sticky to catch grains of pollen
- The **style** holds up the stigma
- The **ovary** contains **ovules**

Pollination and fertilisation

Pollination is the **fertilisation** of the ovule, the point at which the pollen is transferred to the ovule from the anther to the stigma, there are two types of pollination

- Cross pollination is between two different types of plant
- Self pollination happens within the same plant



Germination is the process in which the **seed** begins to grow, for this to occur the seed needs:

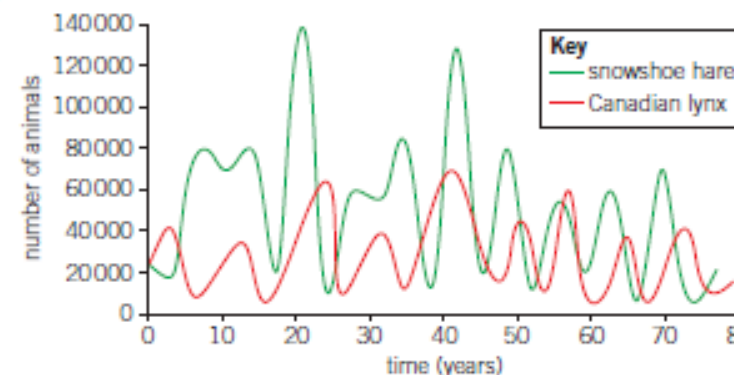
- Water to allow the seed to swell and grow and for the embryo to start growing
- Oxygen for that the cell can start respiring to release energy for germination
- Warmth to allow the chemical reactions to start to occur within the seed

Ecosystems

- All of the organisms which live in one area are known as a **population**
- An **ecosystem** is all of the organisms which are found in a particular location and the area in which they live in, both the living and non-living features
- A **community** are all of the areas in an ecosystem, the area in which the organisms live in is known as the **habitat**
- A **niche** is the specific role in which an organism has within an ecosystem, for example a panda's diet consists of 99% bamboo

Competition

- **Competition** is the process in which organisms compete with one another for resources
- Animals compete for food, water, space and mates
- Plants compete for light, water, space and minerals
- The best competitors are those who have adapted in order to best gain these resources
- As the number of a predator in a population increases the number of the prey will decrease as more are being eaten
- As the number of the predator decreases the number of the prey will increase as less are being eaten
- The relationship between the predator and the prey is known as a **predator-prey relationship**



Key terms

Make sure you can write definitions for these key terms.

anther bioaccumulation carpel community competition consumer ecosystem fertilisation food chain food web germination habitat interdependence
 niche ovary ovule petal predator prey producer pollen pollination population seed sepal stamen stigma style

Respiration

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

$$\text{glucose} + \text{oxygen} \rightarrow \text{carbon dioxide} + \text{water}$$
 - The glucose is transported to the cells in the blood **plasma**
 - The oxygen is transported to the cells in **red blood cells**, by binding with **haemoglobin**
 - Carbon dioxide is a waste product and is transported from the cells to the lungs to be exhaled
-
- Anaerobic respiration** is a type of respiration which does not use oxygen, it is used when the body cannot supply the cells with enough oxygen for aerobic respiration
 - Anaerobic respiration releases less energy than aerobic respiration

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



Fermentation

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

$$\text{glucose} \rightarrow \text{ethanol} + \text{carbon dioxide}$$
- This process can be used to form alcohol to drink or to allow bread and cakes to rise

Plant minerals

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

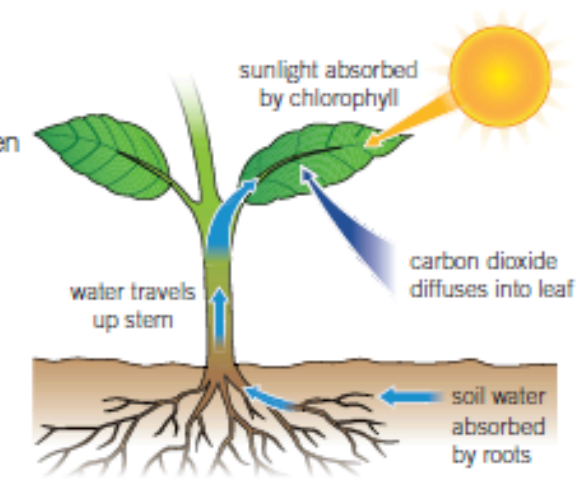
Mineral	What is it used for?	What happens if there is not enough?
nitrates (contain nitrogen)	healthy growth	poor growth and older leaves yellow
phosphates (contain phosphorus)	healthy roots	poor growth, younger leaves look purple
potassium	healthy leaves and flowers	yellow leaves with dead patches
magnesium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

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

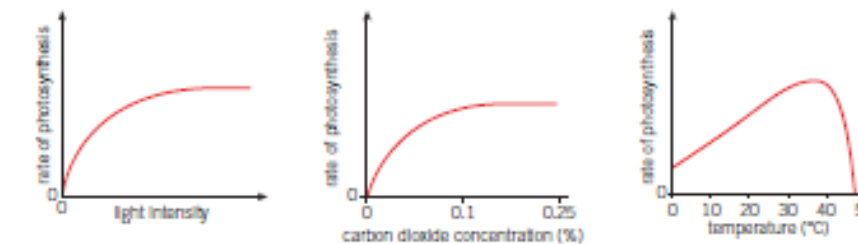
Photosynthesis

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

$$\text{water} + \text{carbon dioxide} + \text{sunlight} \rightarrow \text{glucose} + \text{oxygen}$$
- Any organism that can use photosynthesis to produce its own food is known as a **producer**, these are not just limited to plants but can include other organisms such as **algae**

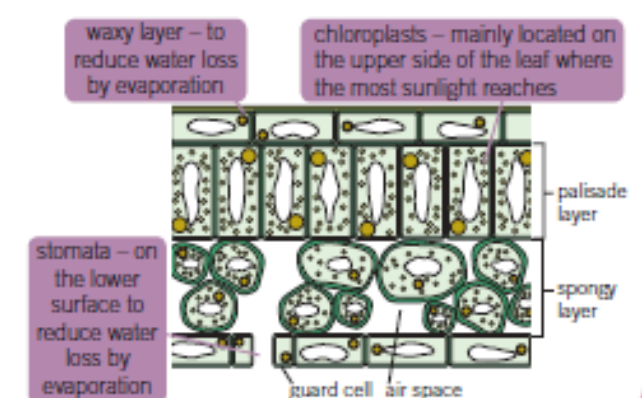


- The rate of photosynthesis can be affected by:
 - Light intensity – the higher the light intensity the higher the rate of photosynthesis up to a point
 - Carbon dioxide concentration – the higher the carbon dioxide concentration the higher the rate of photosynthesis up to a point
 - Temperature – the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



Leaves

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



Key terms

Make sure you can write definitions for these key terms.

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

Respiration

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

$$\text{glucose} + \text{oxygen} \rightarrow \text{carbon dioxide} + \text{water}$$
 - The glucose is transported to the cells in the blood **plasma**
 - The oxygen is transported to the cells in **red blood cells**, by binding with **haemoglobin**
 - Carbon dioxide is a waste product and is transported from the cells to the lungs to be exhaled
-
- Anaerobic respiration** is a type of respiration which does not use oxygen, it is used when the body cannot supply the cells with enough oxygen for aerobic respiration
 - Anaerobic respiration releases less energy than aerobic respiration

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



Fermentation

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

$$\text{glucose} \rightarrow \text{ethanol} + \text{carbon dioxide}$$
- This process can be used to form alcohol to drink or to allow bread and cakes to rise

Plant minerals

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

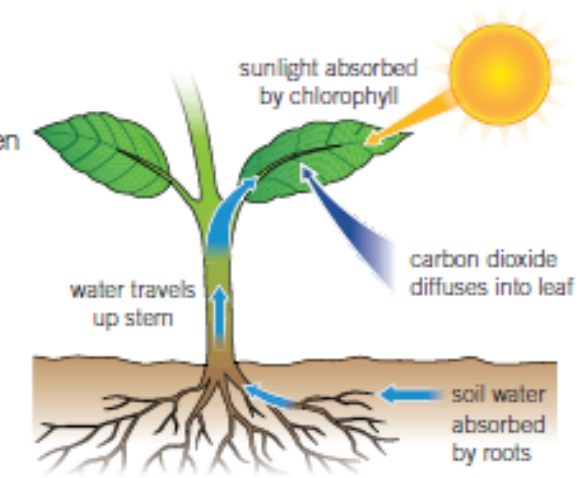
Mineral	What is it used for?	What happens if there is not enough?
nitrates (contain nitrogen)	healthy growth	poor growth and older leaves yellow
phosphates (contain phosphorus)	healthy roots	poor growth, younger leaves look purple
potassium	healthy leaves and flowers	yellow leaves with dead patches
magnesium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

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

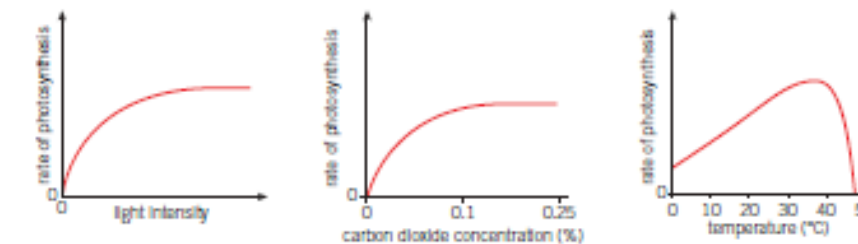
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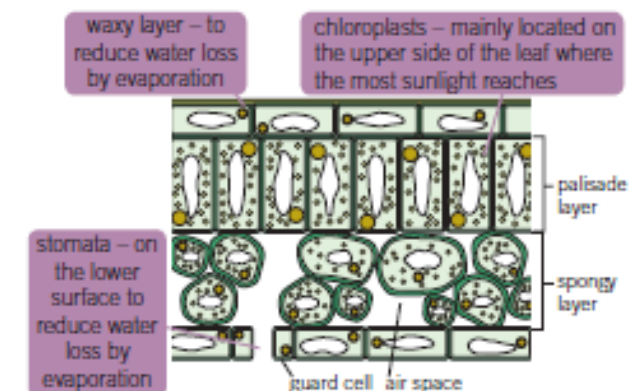


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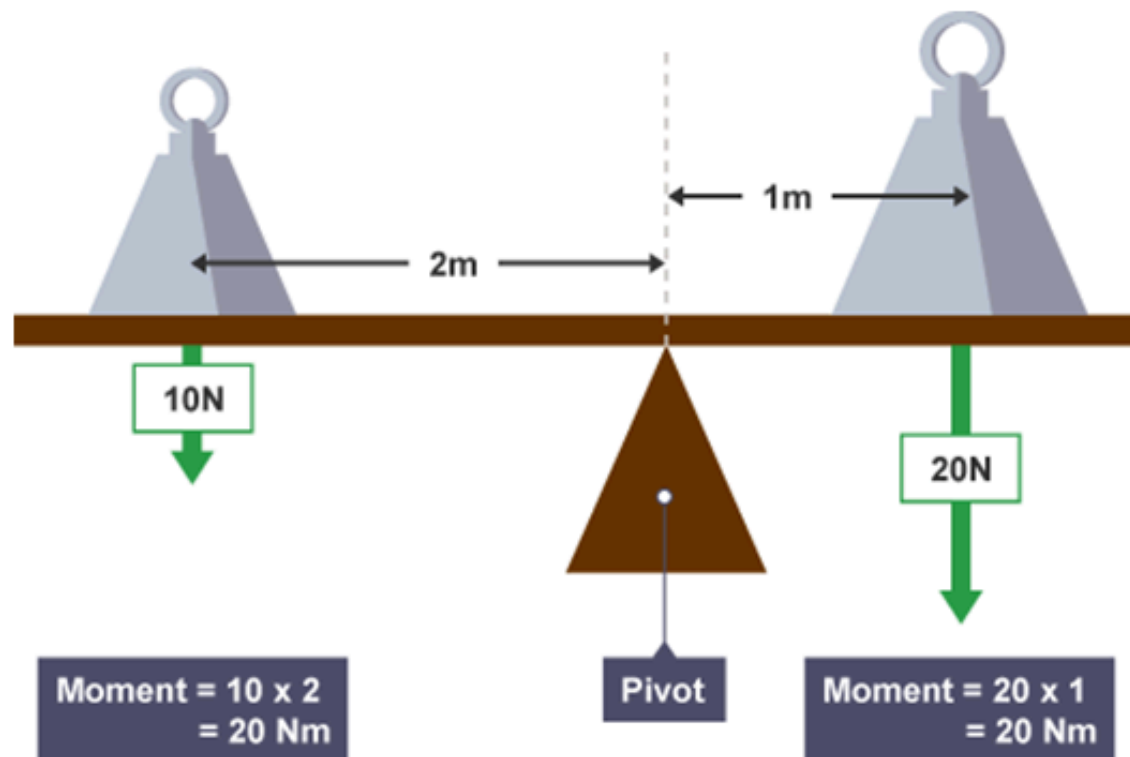
Moments

A moment is the turning effect of a force. In order for a force to provide a turning effect there must be a pivot. For example in a see-saw.

You calculate the moment of a force using the equation:

$$\text{moment} = \text{force} \times \text{distance}$$

The unit of a moment is Newton metres (Nm).



In the situation above the moment is equal on both sides of the pivot so the object will be in balance. If the moments on either side of a pivot are not equal then the object will turn in the direction of the greater moment.

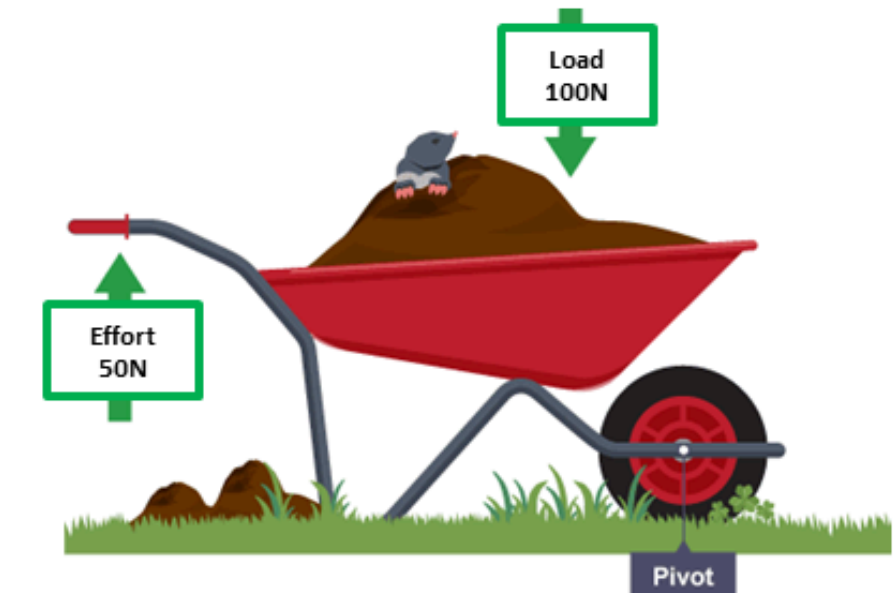
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Uses of moments in simple machines

By adjusting the distances from a pivot and/or adjusting the sizes of the forces acting, the idea of moments can be used to great effect. Look at the examples below for some uses of moments.

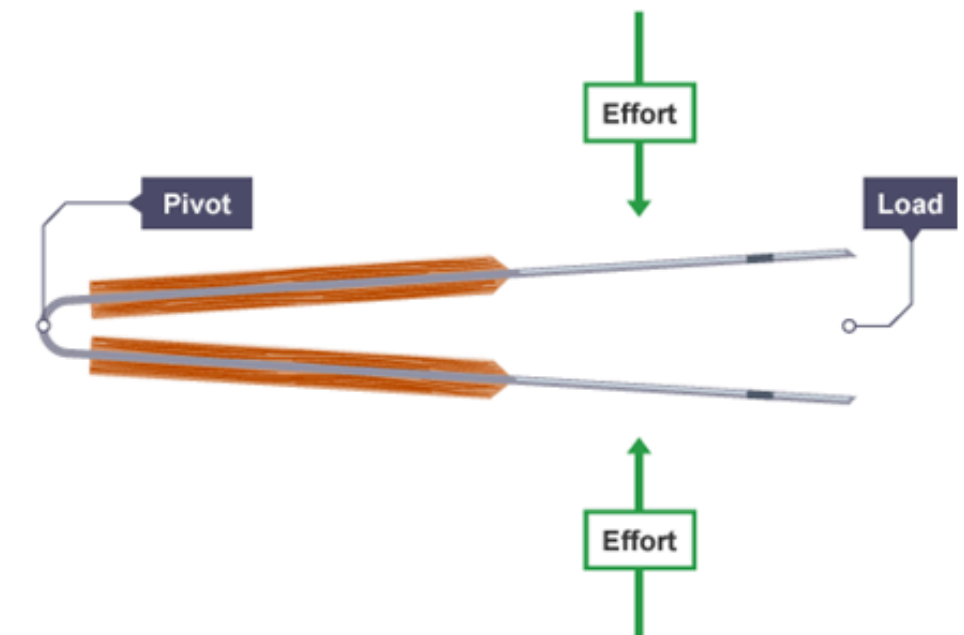
Wheelbarrows

By placing the load in a wheelbarrow *nearer* to the pivot (the wheel), the force needed to lift the wheelbarrow is much less because the handle is further away from the pivot.



Forceps

Forceps use the opposite effect than the wheelbarrow. By providing the force (effort) closer to the pivot the force at the end of the forceps will be smaller. This means you can pick up things more carefully.



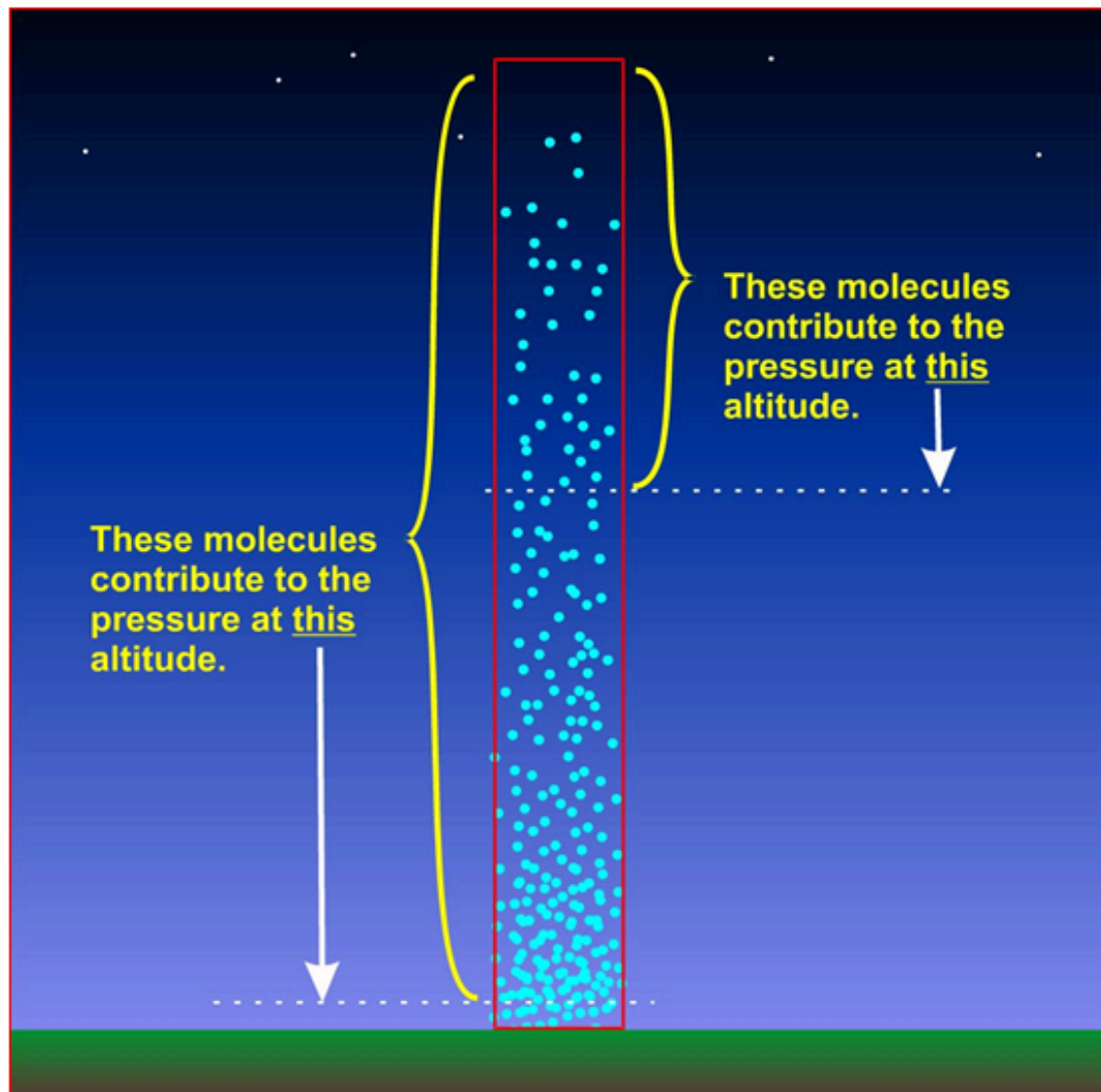
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Atmospheric pressure

The atmosphere exerts a pressure on you, and everything around you.

The mass of the air above us is being attracted to the Earth by the force of gravity. The weight of this air causes atmospheric pressure.

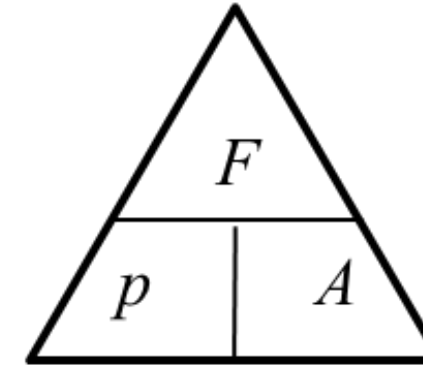
The higher up in the atmosphere that you travel there are fewer molecules above you so you experience a lower atmospheric pressure. At the surface of the Earth we say that the pressure is equal to 1 atmosphere (atm) of pressure. This is equivalent to about 100,000Pa.



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Pressure

$$\text{Pressure (Pa)} = \frac{\text{Force (N)}}{\text{area (m}^2\text{)}}$$



Pressure is caused by an object(s) pushing on another.

The bigger the force applied by the object and the smaller the area over which the force is applied the larger the pressure

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Pressure in liquids

Like air pressure the pressure in a liquid depends upon the amount of liquid above the object. The more liquid above the object the greater the pressure that is exerted. This can be demonstrated by looking at water flowing out of bucket.



The lower down the bucket the hole is the greater force is being applied to the liquid coming out of the bucket. This causes the water jet to squirt further from the bucket.

Pressure in liquids acts on all sides of an object immersed (completely surrounded by) in a liquid. The deeper the object is in the liquid the more pressure that it will experience.

If the object is less dense than the liquid it is suspended in the object will rise in the liquid and float.

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