



KNOWLEDGE ORGANISER YEAR 8

2023 - 2024





KNOWLEDGE ORGANISER
YEAR 8
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Year 8: How to use your Knowledge Organiser book

This book contains **knowledge organisers** for all of your subjects.

Each knowledge organiser has the key information which needs to be memorised to help you master your subjects and be successful in lessons.

Self- quizzing this key information promotes **retrieval strength**. This is your ability to **quickly recall key facts** related to your subject or topic from your **long term memory**.

There are lots of different ways to learn the information in your knowledge organiser. You will be using your **class books** to complete homework and write down and learn the information. You **must** bring your **class books** to school **on each day you have the lesson timetabled** and so packing your school bag the evening before is important.

If you lose your knowledge organiser book you will need to talk to your Head of Year and order a new one at a cost of £1.

Year 8 Subject	Page
Introduction	2 - 6
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Design and Technology 10/01/20

Materials: Timber

A hardwood is from a broad-leaved deciduous tree which has a close grain due to its slow growth. The annual growth rings are close together.

E.g. beech, oak, walnut, sycamore, birch, mahogany and teak.

A softwood comes from a coniferous tree that has needles instead of leaves. It

highlights breakdown learning into chunks

Geography

Finally moving back to home we can see penitence and two birds one morning to America. We hope that in America we will have clean water because in Mexico the water is very dirty and full of debris. My eldest son sandy passes urinary because he drinks too much dirty water and feels is why we are moving. Our house is very small and is made out of dirt and has a straw roof. In the part of town we live in it is very sandy and we don't live on the land, fruits. That can when will our house

extended writing

evidence of care and attention



Homework examples: good practice

Friday 28th September
Maths homework
It is in my maths book.

Monday 23rd September
Science homework
✓ V good work!
Learning for homework
1. Metals can be ductile - made into thin wires
can be stretched into wires
can be bent
2. Metals can be malleable - can be hammered into
shape before breaking.

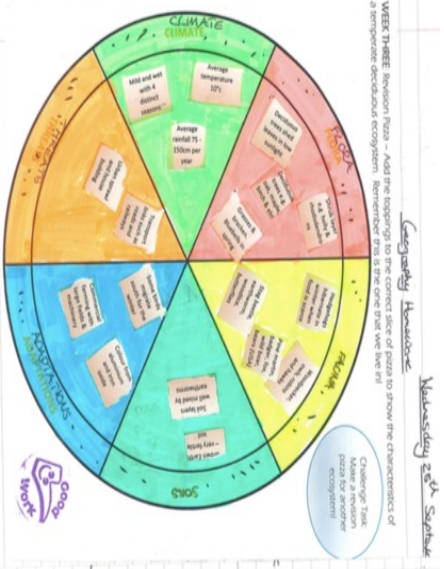
clear subject titles, dates, ruling off

Deposition - Material put down by the river when it loses energy.
channel - The riverbed and banks the river flows on in.

French 11-01-20

Bonjour, le mappelle Ruby. Mon anniversaire est le dix-neuf juin. J'habite à Hiverdon en Angleterre et je suis.

effective use of space

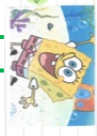


neat organisation

What is a character?
English homework
Monday 23rd September
A character is any person, animal, or figure represented in a literary work.
A character is any character that has the greatest effect on the plot or on the mood of the story.
A character is any person, animal, or figure represented in a literary work.



A character is any person, animal, or figure represented in a literary work.



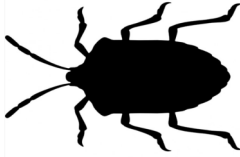
clear links with knowledge organiser

COMMON CURRICULUM COMMAND WORDS

TOP 20

Knowing how to respond to a question, in any subject, is absolutely critical to successfully demonstrate your knowledge. Responding in the correct way to a command word within a question makes the difference between accessing all the marks, or getting none at all! You must be secure in knowing how you should write according to these 'Top 20' highest frequency command words from across the curriculum. Almost all subjects have additional command words you must know too, so check the subject specific command word KOs for further advice on how to master responding to the full range of commands.

QUESTION DECONSTRUCTION SKILLS



BUGS
Box around the command word

Underline the key words

Go over the question again

Spare a line/time for planning

Example of using BUGS:

Explain a valid reason *This means a method of working*

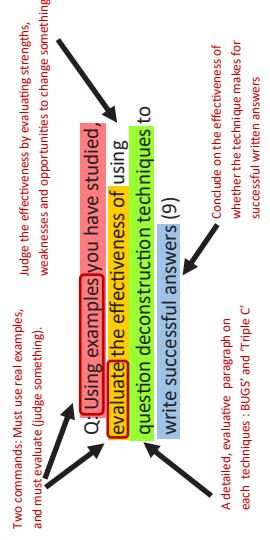
Q: Suggest why using BUGS is a good technique for writing successful answers to exam-style questions (6)

I only earn marks for writing in the appropriate way in exam questions

THE 'TRIPLE C' TECHNIQUE

The 'Triple C' technique for question deconstruction stands for 'Colour Code Complex' questions. This technique is a more in-depth take on using BUGS, which is more effective for longer answer essay questions, or with more complex command words such as: evaluate, discuss, analyse and assess for example. Get your highlighters out and use a different colour for the different clauses and keyword phrases within the question. This will ensure you respond to all parts of the question and paragraph effectively to demonstrate your writing stamina.

Example of using 'TRIPLE C':



Command	How do I respond in my writing ?
Evaluate	Systematically break down the theme of the question to make an informed judgement supported by evidence for the strengths, weaknesses (or limitations), opportunities to improve a way of working or concept, to reach conclusions.
Explain	Give reasons for how or why something is like it is. Write in a way that shows cause and effect. The words 'because', '...as a result', '...this is due to', 'consequently' should be in your writing.
Justify	Write a convincing argument to reach a conclusion supported by evidence.
Label	Labelling is simply naming features or parts of something, these are not sentences
Outline	Give a brief overview of the whole theme of the question. You can describe or explain just the main points in limited detail. The amount you write depends on the amount of content within the question.
Plot	Add data (results or values) onto a graph. Read the axis labels carefully to understand the units. If present, your plotted data should 'look' like the other data already present on the graph.
State	Give the name of a feature or item referenced in the question. <i>Synonyms are: give/name or identify.</i>
Study	This command will often be linked to a resource within a question such as a map, photo or diagram; you are being encouraged to look at and understanding this resource for inclusion in an answer.
Suggest	Explain a possible reason for theme of the question. 'Suggest' questions are asking you to put forward an idea you have.
To what extent	The question is asking how far you agree with something—from fully agree to totally disagree—often a statement or a quote for example. Give your opinion immediately and examine arguments that support and discount your opinion. Support with evidence to reach a conclusion.
Analyse	Systematically break down the theme of the question into parts and examine each in turn. You should include description, explanations and evidence to reach conclusions.
Annotate	Annotations are extended labels. When annotating, you should write brief descriptive or explanatory sentences linked to features referenced in the question.
Assess	Like analyse, assess means to break the theme of the question down into parts but offer your opinion on the successes and failures to reach an informed judgement.
Calculate	You need to use the data (numbers) within the question, or resource that the question is based on, and apply a mathematical function to get your answer.
Compare	An effective comparison will make clear references to both similarities and differences between the items within the questions.
Complete	You are directed to use information available to you (a resource with the question or your knowledge) to finish a task. This is most commonly linked to cloze paragraphs (a.k.a. gap-fill) style questions.
Contrast	Writing to show contrast will make clear references to just differences between the items within the questions.
Define	Give a definition (precise meaning) of the feature or item referenced in the question, such as a word, phrase, concept or physical quantity.
Describe	Write details of what the feature/item or theme are like within the question. Do not explain as a description requires no explanation.
Discuss	Describe and explain a balance of the similarities and differences, or positives and negatives of whatever the question is about. Evidence is important to include—as is your opinion. Always add a conclusion to summarise your discussion.

THS Tier 2 Vocabulary - 100 Word List

Tier 2 words are words that you wouldn't normally use in your everyday speech and aren't subject specific terminology. You are likely to find them when you are reading, or you might use them in your writing. Our THS 100 Word List is made up of 100 words that are often used in exam questions and texts. They are divided into sublists: **sublist 1** has the **most common words** and **sublist 10** has **rarer words**. Recognising these words will help you to understand the texts that you might be given in your different lessons and exams.

- Sublist 1**
1. process
 2. individual
 3. specific
 4. source
 5. identified
 6. create
 7. derived
 8. factors
 9. definition
 10. interpretation
 11. consistent
 12. structure
 13. analysis
 14. indicate
 15. response
 16. context
 17. significant

- Sublist 2**
1. community
 2. relevant
 3. impact
 4. consequences
 5. participation
 6. cultural
 7. affect
 8. effect
 9. complex

- Sublist 4**
1. overall
 2. emerged
 3. approximate
 4. implications
 5. commitment
 6. promote
 7. access
 8. contrast
 9. resolution
 10. adequate

- Sublist 6**
1. presumption
 2. enhanced
 3. capable
 4. revealed
 5. explicit
 6. underlying
 7. exceed

- Sublist 8**
1. eventually
 2. exploitation
 3. virtually
 4. predominantly
 5. implicit
 6. ambiguous
 7. conformity
 8. contemporary
 9. deviation
 10. minimises
 11. radical
 12. inevitably
 13. complement
 14. manipulation

- Sublist 9**
1. commenced
 2. anticipated
 3. incompatible
 4. integral
 5. conversely
 6. temporary
 7. assurance
 8. inherent
 9. duration

- Sublist 10**
1. convinced
 2. persistent
 3. integrity
 4. conceived

- Sublist 3**
1. convention
 2. implies
 3. dominant
 4. constant
 5. justification
 6. alternative
 7. initial
 8. validity
 9. sequence
 10. corresponding
 11. circumstances

- Sublist 5**
1. energy
 2. symbolic
 3. decline
 4. facilitate
 5. logic
 6. sustainable
 7. equivalent
 8. generated
 9. conflict

- Sublist 7**
1. intervention
 2. definite
 3. ultimately
 4. converted
 5. hierarchical
 6. comprehensive
 7. eliminate
 8. contrary
 9. successive
 10. prohibited



Most common

Least common

CURRICULUM COMMAND WORDS

Knowing how to respond to a question, in any subject, is absolutely critical to successfully demonstrate your knowledge! Listed below, are the equally important but less frequent command words that you are likely to face from across your subjects. It is important to know that quite often, a single question can have multiple commands embedded—which will all need your attention in your work.

Command	How do I respond in my writing ?	Command	How do I respond in my writing ?	Command	How do I respond in my writing ?
Acknowledge	Music: To give credit for, recognise, and highlight something, such as a selected source or the work of others.	Explore	Music: To investigate, examine and look into with an open mind about what might be found and developed.	Produce	D&T: Draw or design an isometric or orthographic drawing
Apply	Music: To use knowledge, skills and understanding and to employ appropriate techniques when developing and progressing ideas.	Express	Maths: Re-write in another form, some working may be needed.	Prove	Maths: More formal than 'show', all steps must be present. In the case of a geometrical proof, reasons must be given.
Arrange	History: Put the factors in an order and then justify your choices	Factorise	Maths: Insert brackets by taking out common factors.	Prove algebraically	Maths: Use algebra in the proof.
Change	Maths: Usually convert from one unit to another; either using known metric unit conversions or the use of a conversion graph.	Factorise fully	Maths: Insert brackets by taking out all the common factors.	Realise	Music: To achieve, attain and/or accomplish your intentions.
Collate	Gather and organise your ideas logically	Find	Maths: Some working will be needed to get to the final answer.	Recommend	Put forward or suggest an answer that is suitable for the question
Comment	Write an informed opinion	Give	Typically a very short, undeveloped answer Synonyms: state, name and identify.	Record	Music: To document ideas, thoughts, insights and responses to starting points in visual and written annotated form.
Consider	To think through, review, reflect on, and respond to given information	Give a reason	Maths: Must be clear and accurate reasons. If the reasons are geometrical then make sure you: provide a reason for each stage of working (if required), use correct geometric terminology	Refine	Music: To improve, enhance and change elements of your work for the better.
Convert	Computing: change the form, character or function of something	How far do you agree...	History: Examine the evidence and form a detailed opinion	Research	Music: To study in detail, discover and find information about.
Demonstrate	Music: To show, exhibit, prove or express such things as subject specific knowledge, understanding and skills.	How important was...	History: Judge the importance of the factor and then compare relative to others	Respond	Music: To produce personal work generated by a subject, theme, starting point, or design brief.
Design	Computing: produce a plan, simulation or model	Identify	Provide an answer from a number of possibilities	Review	Review is to explain/evaluate e.g. write about and assess the importance, quality or value of the topic
Determine	Science: Use given data or information to obtain an answer	Interpret	Dance: Translate information into recognisable form. Other subjects: examine information for patterns and causation	Show	Show structured steps or evidence or all workings needed to get to a given answer
Develop	Music: To take forward, change, improve or build on an idea, theme or starting point.	List	Provide the information in a list rather than continuous writing	Simplify	Maths: Simplify the given expression
Draw	Produce a diagram or picture. Note: this command is often linked with 'label' or 'annotate'.	Match	Link or pair-up a definition to the a key term	Simplify fully	Maths: Simplify the given expression. Answer must be given in its simplest form
Estimate	Science: Assign an approximate value	Plan	Science: Write a method used extended bullet point method—unique to writing in Science!	Solve	Maths: Find the solution of an equation or inequality. Computing: Obtain the answer(s) using algebraic/numeric/graphical methods.
Evidence	To show, prove, support and make clear or verify something.	Predict	Science: Suggest the most likely outcome	State	Music: to express clearly and briefly your intentions.
Expand	Maths: Remove brackets	Present	Music: To give a response to an idea, theme or starting point that shows a personal, meaningful and organised fulfilment of intentions.	Tick	Put a mark to indicate that something is correct
Expand and simplify	Maths: Remove brackets and the collect like terms.	Produce	D&T: Draw or design an isometric or orthographic drawing	Use	Answer must be based on or include the information given within the question
				What	Suggest a suitable idea

Year 8 Skill

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/orches 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.



Experimenting

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)



Knowledge

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?

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.

You could use torn paper or selected painted shapes.

Creativity

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

- 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.



Craft Knives

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

HEALTH AND SAFETY



19. Card construction

- Fold – lightly score with a knife and then bend
- Slot – create two slots on the pieces you want top 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





Tiverton High School Year 8 Computing Autumn Term Knowledge Organiser

Parts of a computer system | Key Construct 3: Computer Systems

A **computer** is an **electronic device** that follows a **stored program of instructions**.

The **program** of instructions tell it **how** to process data and how to make things happen e.g. activate outputs.

A **computer system** is a **collection** of parts that **work together** to perform a task – comprised of **hardware** and **software**.

Input devices transfer data **into** the computer processor.

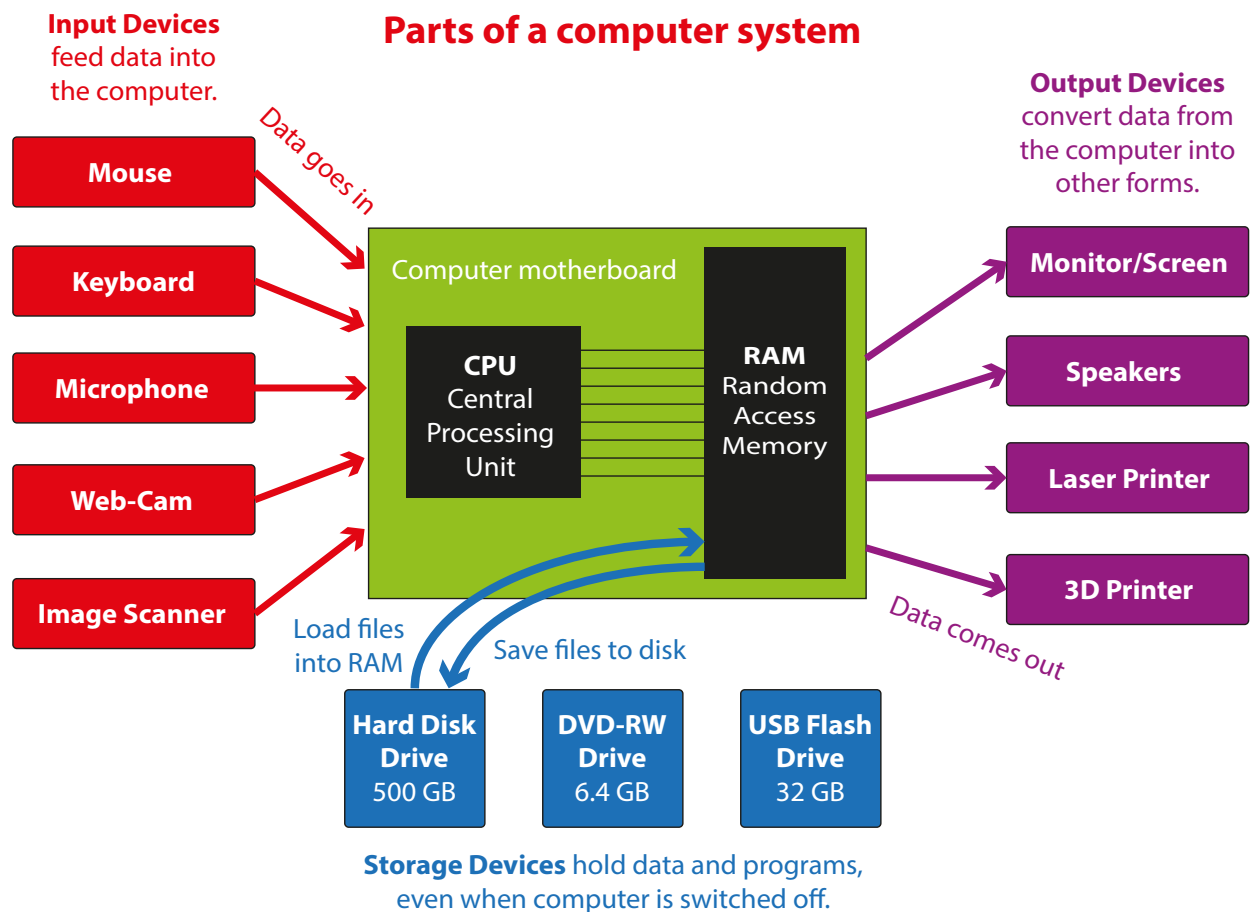
Examples: **QWERTY keyboard, mouse, microphone, web-cam, image scanner, accelerometer, fingerprint sensor.**

Output devices transfer data **out** of the computer for people to use.

Examples: **Screen/monitor, laser printer, audio speakers, 3D printer, robot-arm, LED display, laser cutter.**

Storage devices store data for **long term** or **while the computer is switched off**.

Examples: **Hard-disk drive, solid-state drive, optical drive, USB Flash-drive, magnetic tape drive.**



Computers in control | Key Construct 3: Computer Systems

An **embedded system** is a dedicated single-purpose computer that is **built into some other electronic device**. The embedded computer **controls** the operation of that device.

Examples of embedded systems include **microwave ovens, burglar alarms, digital TV receiver boxes, GPS sat-nav systems.**

Embedded systems usually contain a cheap, simple **microcontroller** chip. They have less RAM and a simpler CPU than a PC.

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.

Data and files can be **compressed** (to **reduce** the amount of data held) so they can be sent and received faster over networks.

mp3, mp4, jpg use **LOSSY compression** because **some of the original data is lost when compressing - it cannot be retrieved.**

A **character** is a **symbol** that can be stored inside the computer system using a special number called a **character code**.

The full collection of ALL of the characters that a computer can represent/store is called a **character set**.

ASCII is the **American Standard Code for Information Interchange**. It can be used for writing in the English language.

Plain ASCII text is often stored using **7 bits per character**.

A better version of ASCII is **Extended ASCII**. This can be used for writing in English, French, German, Spanish or Italian.

Extended ASCII contains more characters than original ASCII, but uses **8 bits** (1 byte) to store each different character code.

Unicode is a better character set. It can represent **any** language in the world, including Russian and Chinese, not just English.

Unicode can use up to **32 bits** for each character code. This means the text takes up more storage space in the computer.

Emoji pictures are character symbols from the Unicode character set. ASCII and Extended-ASCII do not contain any emojis.

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

Parts inside a computer | Key Construct 3: Computer Systems

Hardware means the **physical components, devices and circuitry** of the computer system.

A computer has a **processor** inside it.

Another name for it is the **Central Processing Unit (CPU)**.

The processor **executes** each instruction to carry out a program.

Processor speed is measured in **Hertz (Hz)**... cycles per second.

1 Hz (Hertz) = 1 clock cycle per second (very slow!)
1 MHz (Mega-Hertz) = 1 **million** clock cycles per second.
1 GHz (Giga-Hertz) = 1 **billion** clock cycles per second.

RAM stands for **Random Access Memory**.

RAM is a kind of memory storage inside the computer.

RAM is used to hold the program of instructions that the CPU needs to carry out. It also holds data that the program is using.

RAM is **volatile** - **all data is lost when the power is turned off**.

We “load” programs and data from disk into RAM, ready to use them.

Software | Key Construct 3: Computer Systems

Software means the **programs** that it uses.

Without software, the hardware would be useless, it would not have any instructions to follow.

A **program** is a **set of instructions that tells the computer what to do**.

Operating systems and **utilities** are examples of **systems software**.

Without an operating system, a modern computer would be too difficult to use.

General purpose **applications** include

Word Processors, Spreadsheets, Graphics Packages.

Software utilities include **anti-virus** tools, **firewalls**, **file compression** utilities and **disk management** tools.



Tiverton High School Year 8 Computing Spring Term Knowledge Organiser

Computer networks and the internet | Key Construct 4: Networks and Communication

A **network** is a collection of computers (two or more) and other devices that are connected together.

These connections are usually **copper wire cables**, but they may also sometimes be **fibre-optic cables**, **wi-fi** radio links, or long distance **micro-wave** satellite links.

A **Local Area Network** usually **covers a single site or building in a small area**.

Computer devices can be connected together by plugging them into a **switch** using a copper **Ethernet cable**.

Many devices can communicate without wires, using **radio-waves (wi-fi)** if you add a **wi-fi access-point** to your network. Wi-fi access points send and receive **packets** of data through the air using radio signals.

The **internet** is a way of **connecting networks together**.

"**Internet**" means "**inter-networking**" – **communication BETWEEN networks**.

The internet joins Local Area Networks and Wide Area Networks from many different countries.

Most people access the Internet using a **broadband adaptor/router**.

You can then send and receive data, connecting to other computers using either **telephone lines** or **fibre-optic cables**. To communicate with computers on the Internet you connect to a server called an **Internet Service Provider (ISP)**.

Files and data are split into small chunks of data called **packets**.

Packets can travel across the Internet using different **routes** to get to their destination.

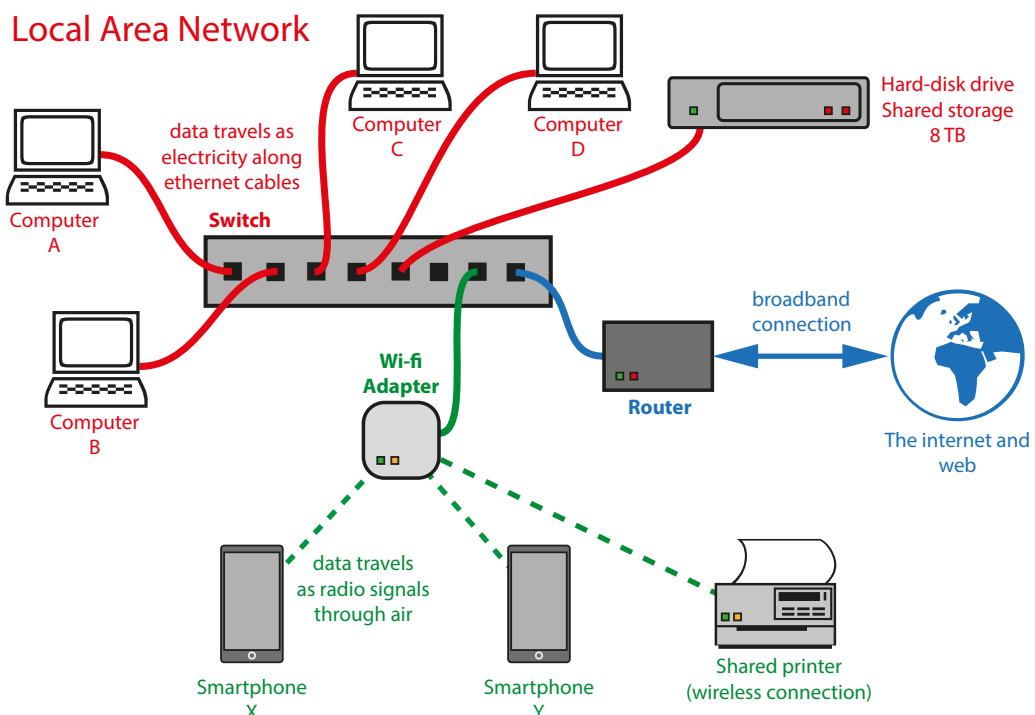
Every device on a network has a special **IP address (Internet Protocol address)**.

Every IP address needs to be **different**, so that devices don't get confused. It would be unclear where a packet needs to be sent.

An **IP address** is a **group of 4 numbers**, each number uses **8-bits** (between **0** and **255**).

Example: **168 . 0 . 192 . 1**

Example: **192 . 70 . 12 . 65**



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

Decomposition means **breaking a problem down into smaller parts**, which are easier to solve.

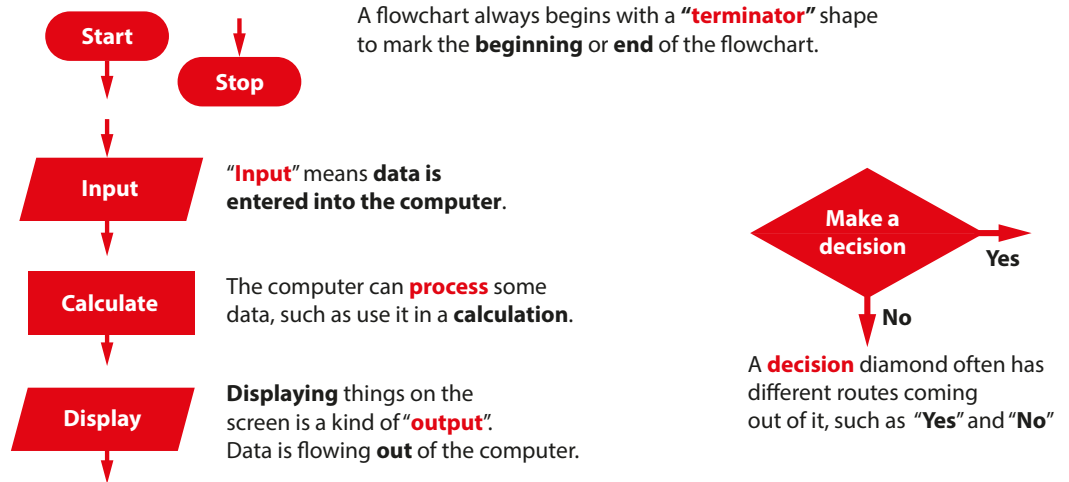
Abstraction means **choosing only the most important details that are relevant to solving the problem**, while **ignoring** other details.

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



Writing pseudo-code | Key Construct 6: Problem Solving and Programming

You can **plan** out the steps of a new program using **pseudo-code**... “false” code. It is not a real **programming language**.

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

```
INPUT width
```

Output means displaying something on the screen:

```
PRINT "Your final score is"  
PRINT score
```

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

```
x = 3                password = "arV$uSw"
```

Iteration means repeatedly executing parts of the program again and again (looping):

```
FOR time = 1 TO 10    WHILE time < 60
```

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

```
IF lives > 0 THEN  
    PRINT "Lost a life"  
ELSE  
    PRINT "Game Over"  
ENDIF
```

Arithmetic operators

```
+    Addition  
-    Subtraction  
*    Multiplication  
/    Division
```

Relational Operator Symbols when making comparisons

<	less than	>	greater than
<=	less than or equal to	>=	greater than or equal to
==	is the same as	!=	not the same as



Tiverton High School Year 8 Computing Summer Term Knowledge Organiser

Developing computer programs using Python | Key Construct 6: Problem Solving and Programming

Python is a **high-level programming language**. It can be used by beginners to create computer programs.

Many people use **IDLE** to create Python code. This is an **Integrated Development Environment**. It contains a **text-editor** for writing Python code and other tools that are helpful to programmers.

When you **save** a new program, the filename needs to end in **.py** so the computer knows it can be executed using Python.

If you make a mistake or type an error in your program, the code may not make sense when Python tries to execute it. Python will stop running your program and try to show you **where** the error is in your code so you can fix it. This is called a **syntax error**.

A **comment** is a line of text in your program code that the computer **will not execute**. It will be used by the computer when running a Python program. It is used as a **reminder** or as an **explanation** to someone about how your code works.

To make text into a comment, type in the **#** symbol at the start of the line of text e.g. **# Main menu starts here**

Your programs can work with different **kinds** of data values. We call these **data-types**.

Integer	a whole number	e.g. 32, -7, 0
Real	a number that can contain a decimal point , these are called "float" values in Python	e.g. 3.14
Boolean	a value that can only hold one of two possible states, either True or False	
Character	a SINGLE character symbol .	e.g. one letter , one digit , a punctuation mark . '?'
String	a sequence of characters .	e.g. 'This cheese smells.'

Most Python programs use **variables**. A variable is a named value that can be **changed** during the execution of a program. When we set the value for a variable, we call this **assignment** (we are assigning a value).

Use the **= assignment operator** to **set a value** e.g. **password = '\$ecRet123'**

A **print** statement **displays a line of text on the screen**. This is an **output**.

Text enclosed by **' '** quotes will literally be displayed. Anything without quotes will display the value of a variable.

```
print( 'Hello' )  
print( password )
```

An **input** statement allows people to type useful data **into** a program once it is running.

Whenever you type a data value into the computer, the value must be **stored** in a **variable** (so the computer does not lose it).

```
surname = input( 'Type in your surname... ' )
```

A program can make **decisions** while it is running to **choose** what should happen next. This is called **selection**.

It can **decide** whether or not something should happen, depending on whether a **condition** is found to be **True** or **False**.

```
if guesses <= 5 :  
    print( 'Try again.' )  
else :  
    print( 'No guesses left.' )
```

When making **comparisons** to **select** what should happen, you can also use these **operators** to **compare values**:

==	means equal to , "the same as"
!=	means not equal to , "not the same as"

Iteration means to carry out instructions **more than once**.

You can carry them out a certain, definite number of times using a **for** loop.

```
for loop in range( 1, 6 ) :
```

You can also carry out a sequence of instructions only while a certain condition holds **True**, using a **while** loop.

```
while messageToRead == True :
```


DESIGN & TECHNOLOGY

Design and technology EOYE knowledge organiser. Year 8 exam preparation has 4 areas of **Design and technology**. These are Investigating, Designing and making, Analysing and evaluating, demonstrating and applying knowledge.

1. Analysing using CCESS 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 we improve its aesthetics?

Cost How much does the product 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 consumer's needs?

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

Environment Is the product environmentally friendly? How can we 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 its intended consumer?

Materials and manufacture What is it made from and how is it 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?

2. 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.

3. 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.

4. 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 its method. But, the demand/need for the product is a lot of higher, such as Toilet paper.

5. Tools and what they are used for.

Scribe for Marking on to metal.



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



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



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



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



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



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



6. 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.

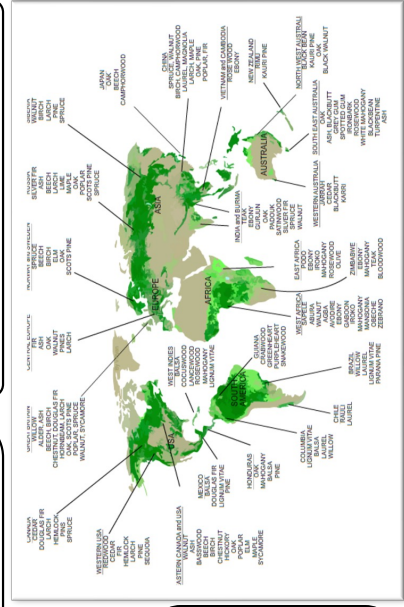
7. Health and safety-

1. Apron on to protect your clothes
2. Long hair tied back so it does not get caught in the machinery.
3. Listen carefully to instructions so you know how to use the tools and machinery
4. Only one person in the yellow zone so you do not distract students using the machinery.
5. Ensure all tools are put back safely and report any damaged tools so they can be mended for next lesson.
6. Wear goggles if using machinery like a pillar drill so saw dust does not get in your eye.

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

6. Wood-Cheap Softwood - Origins

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



DESIGN & TECHNOLOGY

9. 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

10. Textiles construction

Temporary construction is using pins and tacking thread to hold 2 pieces of fabric together.
Permanent constructions is using the sewing machine.

11. 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.

12. 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.

13. Woven fabric.

Selvage- the edge

Bias- the diagonal

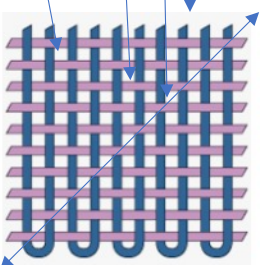
Warp- yarns running from top

to bottom

Weft- a continuous year running

right to left then left to right

weaving in and out of the warp



14. 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.

15. 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.

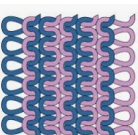


Knitted fabrics are made by interlocking

one or more yarns together using

loops. Air is trapped so they insulate.

They stretch more than woven fabrics.



16. 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.


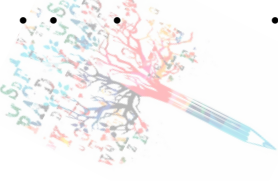
Thermoforming plastic, however, can be heated and shaped, then heated and shaped again. These polymers are also often referred to simply as 'thermoplastics'.

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:

- acrylic
- polypropylene
- high impact polystyrene (HIPS)
- poly(lactic acid) (PLA) (if the school has a 3D printer)



English Year 8 Writing	
1. Key Terms	<p>1. Etymology: the study of the history of words.</p> <p>2. Register: how formal the language used is e.g. formal, neutral, informal.</p> <p>3. Avatar: The character in a game that the player gets to control when playing.</p> <p>4. Target audience: The specific group of people that something is aimed at.</p> <p>5. Protagonist: The main character in a plot.</p> <p>6. Antagonist: Someone who opposes or is hostile towards the main character.</p> <p>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).</p> <p>8. Genre: different types of writing which share similar features.</p> <p>9. Nuance: subtle or slight difference.</p> <p>10. Perspective: a way of looking at something, a viewpoint.</p> <p>11. Sensory: descriptions which relate to the five senses.</p> <p>12. Rhetoric: persuasive language and style.</p>
2. Useful Sentence Starters	<p>1. Adverbials. E.g. Forcefully, the... -ed words. E.g. Focused, challenged</p> <p>3. -ing verbs. E.g. Vaulting, sprinting...</p> <p>4. Simile starts. e.g. Like an uncoiled spring, the ...</p> <p>5. Prepositions. E.g. Above the door...</p> <p>6. List of adjectives. E.g. Strong, powerful, majestic...</p> <p>7. Comparisons. E.g. Unlike the armoured opponent, the...</p> <p>8. A noun to start. e.g. Quests are often...</p> <p>9. When...</p> <p>10. As ...</p> <p>11. Although ... <i>English</i> </p>
3. Ways to make your writing more persuasive and engaging	<p>Anecdote E.g. That reminds me of a time when I...</p> <p>Alliteration E.g. Powerful, prancing penguins.</p> <p>Pronouns E.g. I, you, he, she, we</p> <p>Facts E.g. Completing puzzles helps your memory.</p> <p>Opinions E.g. Xbox is the best games console.</p> <p>Rhetorical Questions E.g. How would you feel if...?</p> <p>Repetition E.g. Monopoly is fun, fun fun!</p> <p>Emotive Language e.g. I was isolated and alone.</p> <p>Exaggeration e.g. Gaming is taking over the world.</p> <p>Statistics e.g. 89% of people have played a computer game.</p> <p>Threes e.g. Playing games is exciting, challenging and rewarding.</p> <p>Vary sentences for pace</p> <p>Sensory language</p>
4. PALL: planning for non-fiction writing	<p>Example: Games Room</p> <p>Purpose: To persuade the audience to invest in your game.</p> <p>Audience: A panel of industry experts looking to invest in a new game.</p> <p>Language: Persuasive, informative and engaging.</p> <p>Layout – 6 paragraphs including:</p> <ul style="list-style-type: none"> • Introduction • Setting and plot • Introducing main character • Explanation of how the plot develops and how it fills a gap in the market • Conclusion  <p>What is the PALL for your writing?</p>
6. SPaG: complete these	<p>Apostrophes are used for...</p> <p>Ellipsis is used to...</p> <p>An exclamation mark shows ...</p> <p>Commas are used to...</p> <p>Brackets can...</p> <p>A semi colon is used to...</p>
5. Mood words. Can you write a paragraph to demonstrate each one?	<ol style="list-style-type: none"> Intriguing Anticipatory Tense Exhilarating Frantic Exhilarating Chaotic Suspicious Foreboding Ominous Mysterious Whimsical Awe-inspiring Idyllic Playful Hopeful Sombre Energetic Dreamy Aggressive
7. Super Spellings	<ol style="list-style-type: none"> Virtually Persistent Sinister Dominant Participation Quest Valiantly Eliminate Response Generated Energy Victorious Promote Succeed Effervescent Illuminating Consequences Strategy

1. Key Terms		English Year 8 Reading		4. Contextual Information		7. Further reading			
<ol style="list-style-type: none"> Protagonist: central character or hero who moves the story forward. Genre: different types of writing which share similar features. Culture: the customs, behaviours, celebrations and social institutions of a group of people. Audience: the person or people who will be listening to or reading your text. Purpose: the reason you are doing something. Intent: what you are trying to achieve Reveals: gives new information. Demonstrates: gives an example of something that has already been mentioned. Implies: suggests something – hints at something. Evokes a feeling of: creates a feeling. Suggests: an idea is put forward. Monologue: a longer speech by a character to another character. Soliloquy: a longer speech by a character to themselves or the audience. Cyclical: happens in circles, reoccurs. 		<ol style="list-style-type: none"> Interpretation Significant Circumstances Ultimately Ambiguous Alternative Implicit Consistent Integral Exploitation Manipulation Implications Community Enhanced Resolution Temporary 		<ol style="list-style-type: none"> 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... 		<p>Context is the background information that helps us to understand the story and characters better.</p> <p>Author information: What do they usually write about, what influenced them, what was their life experience?</p> <p>Era: When was it written? What did people at the time believe about the world that was different to what we believe today?</p> <p>Historical Events: Were there any big events that will have affected the characters in the story?</p> <p>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?</p> <p>Genre Are there any techniques that are used in the story that are common in this particular style of novel?</p> <p>Audience How would an audience in this time/location react differently to us?</p>		<p>The Boy in the striped Pyjamas - John Boyne</p> <p>Scythe Trilogy - Neal Schusterman</p> <p>The Poet X - Elizabeth Acevedo</p> <p>The Lie Tree - Frances Hardinge</p> <p>Hunger Games Trilogy - Suzanne Collins</p> <p>The Red Ribbon - Lucy Adlington</p> <p>Mortal Engines - Phillip Reeve</p> <p>The Enemy Series - Charlie Higson</p> <p>Bone Talk - Candy Gourlay</p> <p>The Graveyard Book - Neil Gaiman</p> <p>Things a bright girl can do - Sally Nicholls</p> <p>Chronicles of Narnia series - CS Lewis</p> <p>The Divergent Series - Veronica Roth</p> <p>Chaos Walking Series - Patrick Ness</p> <p>Percy Jackson Series - Rick Riordan</p> <p>The Smell of Other People's Houses - Bonnie-Sue Hitchcock</p> <p>School of Good and Evil series - Soman Chainani</p> <p>House with the Chicken Legs - Sophie Anderson</p>	
<ol style="list-style-type: none"> 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? 		<h3>5. Big questions</h3>		<h3>6. Structuring your essay</h3> <p>Introduction What is the novel about? '... by ...' is about... What does the writer want you to think about?</p> <p>Analysing the text Chose moments from the text that you think are important to answer the question. ... is presented as ... when ... suggests which suggest ... This makes me... Can you choose moments from the beginning, middle and end of the text?</p> <p>Conclusion What are your overall thoughts? How successful was the writer? Overall I feel... I think the ... wanted us to....</p>					

English Year 8 Speaking and Listening

1. Key Terminology:

Target Audience: The specific group of people something is aimed at.

Counter Argument: An opposing view that considers the other side of an issue.

Topic Sentence: The first sentence of a paragraph that summarises what the paragraph will be about.

Facial Expression: The way you use your face to show your emotions.

Intonation: The way you vary the pitch and volume of your voice.

Demographic: The particular group/area that your product/speech is aimed at.

Non verbal communication: Gestures, sounds and body language used to show the person speaking that you are following what they're saying (e.g. nodding).

4. Famous Speeches

- **Martin Luther King** – I have a dream
- **Winston Churchill** – We shall fight on the beaches
- **Rocky Balboa** – The World ain't all sunshine and rainbows
- **Chickens Run** – Ginger's speech
- **Greta Thunberg** – Global warming.

2. Super Spellings

1. Communicate
2. Consider
3. Compromise
4. Impact
5. Identified
6. Source
7. Process
8. Specific
9. Derived
10. Significant
11. Relevant
12. Convention
13. Dominant
14. Alternative
15. Sequence
16. Circumstances
17. Emerged
18. Resolution

3. PALL of 'The Games Room' speech

Purpose: To persuade the audience to invest in your game.

Audience: A panel of industry experts looking to invest in a new game.

Language: Persuasive, informative and engaging

Layout – 6 paragraphs including:

- Introduction
- Setting and plot
- Introducing the main character
- Explanation of how the plot develops and fills a gap in the market.
- Conclusion.

5. Success Criteria

- Express challenging ideas/information/feelings using a range of vocabulary.
- Respond to what you hear in a thoughtful and considerate way.
- Organise and structure ideas clearly to meet the needs of the listener.
- Ask questions to clarify understanding of other's ideas.
- Engage with other's ideas.
- Listen to questions and feedback, responding formally and in some detail.
- Make effective contributions which help shape discussions.

6. Persuasive Techniques

Alliteration: starting 2 or more words with the same letter.

Anecdote: a short story to support your idea

Pronouns: I, you, he, she, we

Facts: something proven to be true

Opinion: a personal view.

Repetition: using the same word/phrase more than once.

Rhetorical Questions: a question that doesn't require an answer but encourages deeper thought.

Exaggeration: making an over the top statement.

Emotive Language: language that is designed to evoke an emotional response.

Statistics: numerical fractions and percentages.

Threes: using three words/phrases to support or describe.

FOOD YR 8 BRITISH CUISINE

NUTRITION

FOOD PROVENANCE

FOOD SAFETY

FOOD SCIENCE

FOOD CHOICE

FOOD IN INDUSTRY

COOKING AND FOOD PREPARATION

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

FIBRE – Vegetables, wholemeal flours, pasta – aids digestion

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

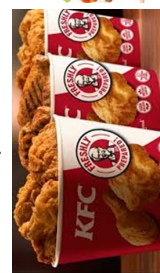
Fast food - negatives

High in sugar, fat and salt

Artificial additives

Not fresh

Throw away utensils etc



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

Traditional British Foods – Fish and chips, pasty, Scones, Roast

WALES – Bara Brith

SCOTLAND – Haggis

IRELAND – Soda Bread

ENGLAND – Bakewell Tart



Scones are 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

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 you a number to indicate whether you are over/ under weight

OBESITY – When your BMI is over 30 (you are largely overweight)

BALANCE: INPUT V OUTPUT

G

TIMELINE OF BRITISH FOODS

17th Century – Only ate what they could catch/ rear (meat) and what they could grow (fruit and vegetables) – Stews, roasts

18th/19th Century – British troops occupied India. They returned with spices which were used to recreate Indian dishes – Curries, Kedgeree.

H

20th Century – The introduction of technology. TV – cooking shows. Shops – importation of food, more variety available. Cookery books. Fridges, Freezers.

Today – Fast foods. Drive through's, order on line, mobile apps, Buy one get one free



BRITISH CUISINE



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

I

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

J

Radiation-Conduction-Convection



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

K

Pane – Flour, egg, breadcrumbs – coating a food

L

FOOD YR 8 INTERNATIONAL CUISINE

NUTRITION

FOOD PROVENANCE

FOOD SCIENCE

FOOD IN INDUSTRY

FOOD CHOICE

FOOD SAFETY

COOKING AND FOOD PREPARATION

Macronutrients are the nutrients we need in larger quantities that provide us with energy: in other words, **fat, protein and carbohydrate**.

Micronutrients are mostly **vitamins and minerals**, and are equally important but consumed in very small amounts.

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 a brown rice
- Using an oil to fry rather than butter

Naan bread
Garlic, Coriander, Peshwari, Plain Keema

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

Consider the nutrition of dishes from other countries

INTERNATIONAL CUISINE



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

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

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

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

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



Religion

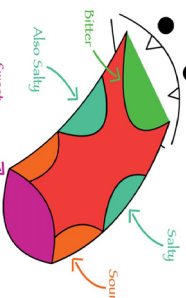
Beliefs

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

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

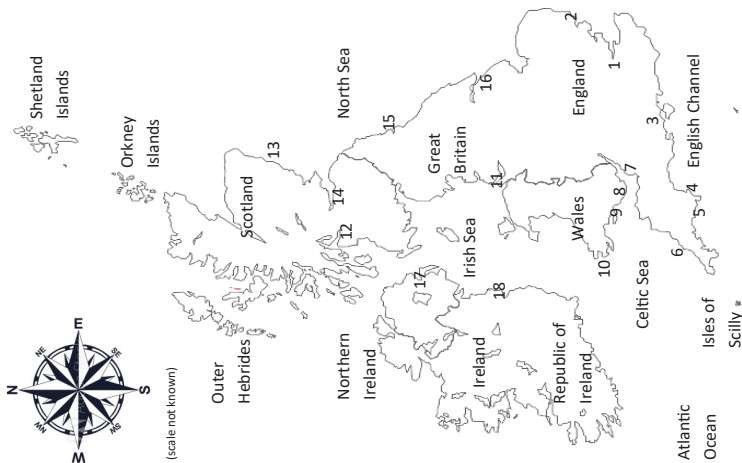
Herbs & Spices

Herb = Leaf of the plant: Bay leaf, Parsley, Sage, Rosemary
Spice = Any other part of the plant – (bark, seeds, root)
Cumin, Nutmeg, Cinnamon, Ginger



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

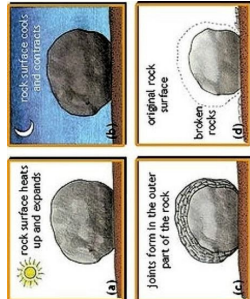
Coasts Key terms

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	tomboles	defences
soft engineering	groyne	recurved sea wall
rock armour	beach replenishment	
managed retreat	dune regeneration	

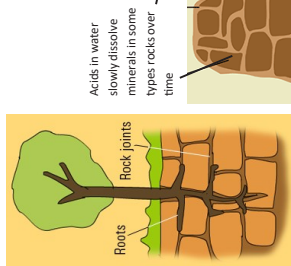
2. Weathering processes

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

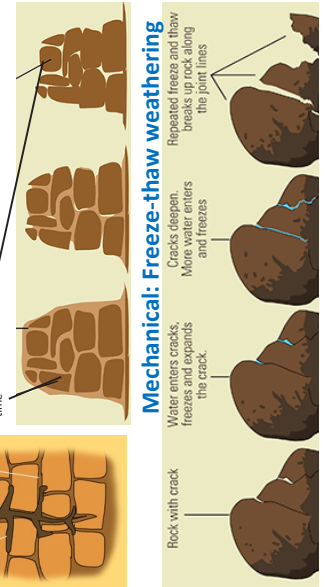


Biological weathering



Acids in water slowly dissolve minerals in some types of rocks over time.

Chemical weathering



Mechanical: Freeze-thaw weathering

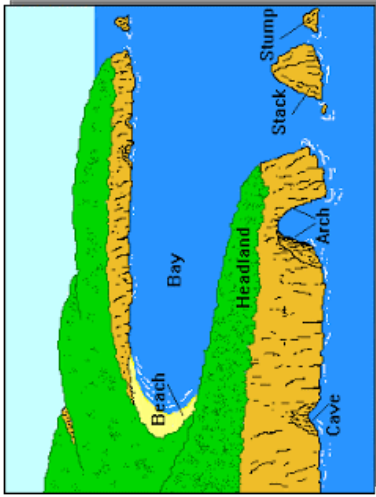
Cracks deepen. More water enters and freezes. Repeated freeze and thaw breaks up rock along the joint lines.

3. Coastal Erosion Processes

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

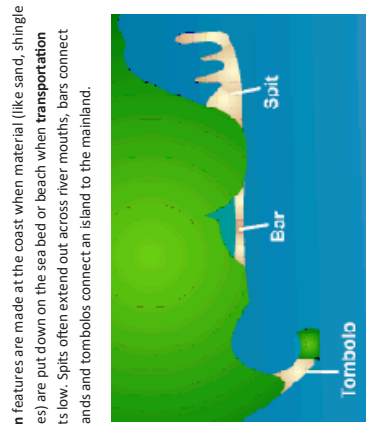
Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolves rocks.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.

3. Coastal Erosion features

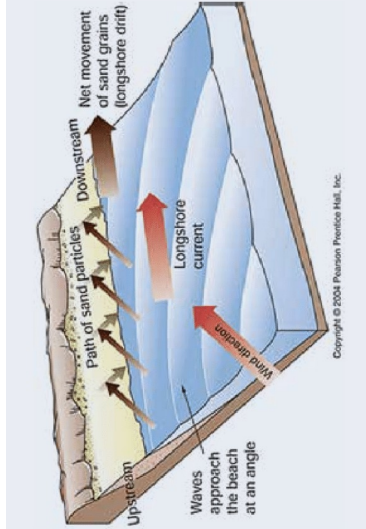


4. Longshore Drift (LSD) -

a transportation process



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:

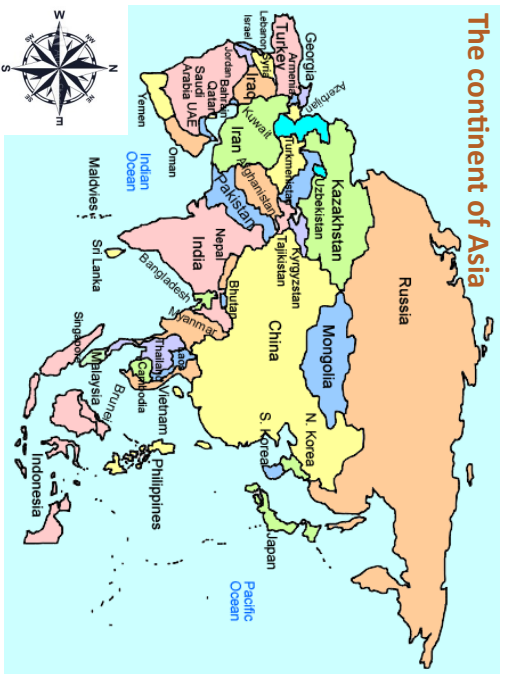
Fetch	The amount of open water available for the wind to blow over. Bigger fetch leads to better potential for waves.
Wind direction	Consistent wind direction can build a swell of waves lasting many days.
Wind Strength	The stronger the wind, the greater the potential for waves to form.
Wind duration	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	Beach replenishment Dredged sand from offshore is pumped back onto the beach to make the waves break sooner.

GEOGRAPHY 8.2. Asia Case Study

The continent of Asia



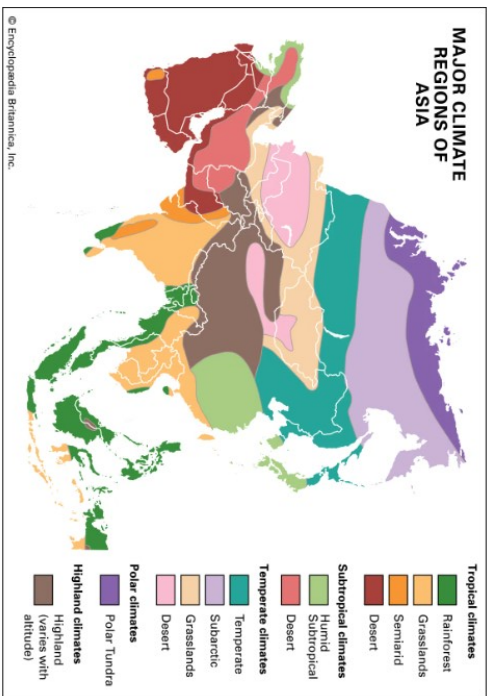
Absolute location

Precise facts about place location. You can use continent, the region within the continent, latitude and longitude and reference to the relative size of the location in question. For example, Russia is the largest country in Asia located across the entire northern edge of the continent.

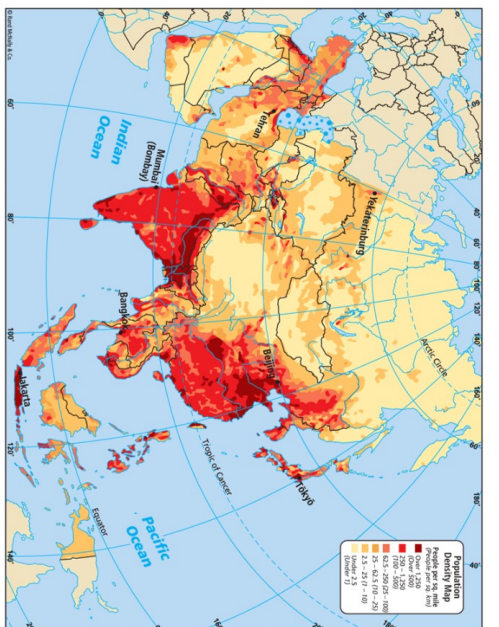
Relative location

Use neighbouring countries, bodies of water—such as seas and oceans and mountain ranges as reference points. Use vocabulary based on compass directions to link to your location. For example, Mongolia is south of Russia and north of China.

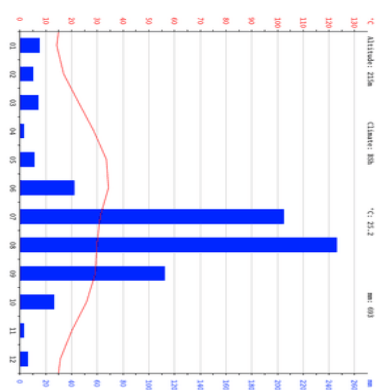
1. Biomes of Asia



2. Population Distribution



4. Climate graph of Delhi, India



4. Monsoon Seasons

The monsoons are seasonal wind patterns that affect many countries in the tropical and sub-tropical regions of the world. In India's case, as the northern hemisphere summer begins, the intense sun heat bakes the country and temperatures can soar into the 40°Cs! The hot air over the country rises—which draws the wind in from over the Indian Ocean to the south. (see red arrows on map to left). The tropical maritime air brings moisture and therefore heavy rainfall (see climate graph). As the Autumn sets in, the winds switch direction and the band of heavy rains returns southwards (see green arrows on map), and the monsoon season ends.

5. Rural to Urban Migration

Many Indian people have done so, or are considering the move to the city. Some people migrate by choice, others by necessity—in the hope of securing a better future. Motivation to leave a place is called a 'push factor', the attraction of an alternate place is called a 'pull factor'. India's urban populations are increasing rapidly and although it takes a very long time, a better life can be achieved by a large amount of migrants who make the move to the city.

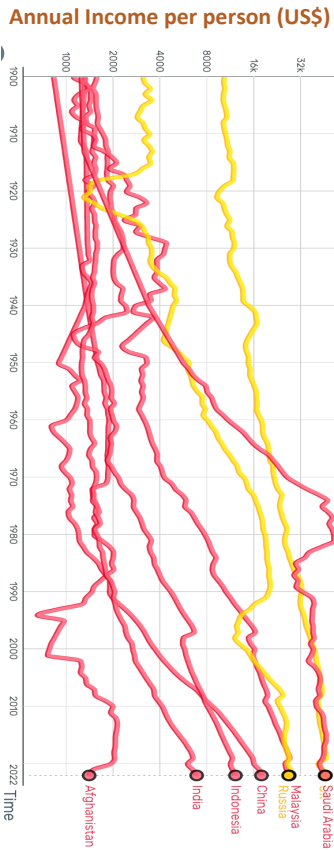
Push Factors

- lack of job opportunities
- unhappy life
- poor transport links
- natural disasters
- disease
- storage of food

Pull Factors

- access to services
- better job opportunities
- more entertainment facilities
- better transport links
- improved living conditions
- hope of a better way of life
- family links

3. and 6. Development Inequality across Asia since 1900



Asia has extreme inequality (compared to Europe for example) with some countries still classed as LICs, yet some are successful HICs. Some countries have vast oil wealth—such as Saudi Arabia, whilst others have been devastated by war (Afghanistan). Many Asian countries are making rapid economic progress since the 1980s - with countries like Malaysia, Indonesia, India and especially China (the fastest growing economy of them all); these are the Newly Emerging Economies (NEEs).

3 & 5 India's growing cities—problems or progress?



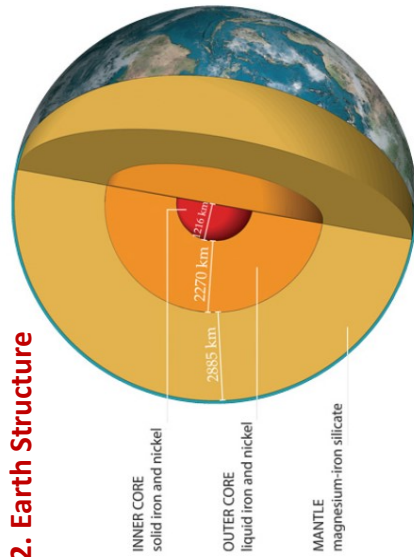
over \$1bn—whilst in the same city, millions of people live in slums. Slums are unplanned, unregulated squatter settlements that sprawl on the edges of cities or occupy any available space within the city. They are often built in areas threatened by floods, landslides and other hazards. Disease is common due to a lack of sanitation. However, Dharavi slum is also a hive of business activity whereby busy locals are working to create products sold to a combined value of over \$1bn a year! Education access is improving and this makes Dharavi a beacon of hope whereby the next generation of India doctors

India has many megacities: populations of 10 million or more. There are huge inequalities within such cities in India whereby the very wealthy, all the way down to the homeless, live within the same urban area. The city of Mumbai contains the most expensive home in the world—valued at

over \$1bn—whilst in the same city, millions of people live in slums. Slums are unplanned, unregulated squatter settlements that sprawl on the edges of cities or occupy any available space within the city. They are often built in areas threatened by floods, landslides and other hazards. Disease is common due to a lack of sanitation. However, Dharavi slum is also a hive of business activity whereby busy locals are working to create products sold to a combined value of over \$1bn a year! Education access is improving and this makes Dharavi a beacon of hope whereby the next generation of India doctors

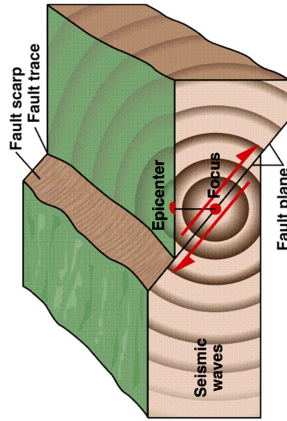
GEOGRAPHY 8.3. HAZARDS

2. Earth Structure



5. Earthquake Concepts

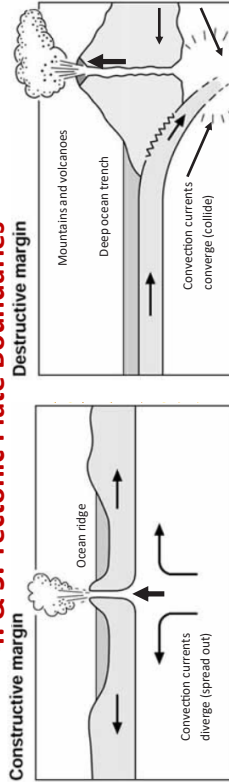
Earthquakes are a violent release of strain energy within the crust of Earth. The constantly churning convection currents in the mantle are responsible for slowly moving the crust around. However, the tectonic plates making up the crust are often being forced together or past each other and get stuck—building up huge amounts of energy, eventually it has to be released!



3. Tectonic Plate Boundary map



4. & 5. Tectonic Plate Boundaries



Convection currents under the crust in the mantle are slowly dragging the crust apart. To fill the gap, magma bursts up onto the seafloor (or out of volcanoes sometimes above sea level at these margins) and cools as lava forming new crust. This effectively means the seafloor is spreading and the continents on either side are moving apart. Volcanoes and earthquakes are gentle in these locations.

The convection currents here are converging (colliding). The denser oceanic crust sinks and grinds past the thicker, less dense continental crust. The friction destroys and melts the oceanic crust turning it into magma. The magma to violently break through out of volcanoes. Huge pressures released along these boundaries when the plates move cause massive earthquakes.

Natural Events

- These natural events just happen in nature:
- Volcanic eruption
 - tsunami
 - Blizzard
 - drought
 - tornado
 - earthquake
 - Tropical storm
 - wildfire
 - Avalanche
 - mudslide
 - flood

The Human Factor

The actions and locations of people put them at risk. For example, living on floodplains, living near tectonic boundaries, living in poverty and changing the climate all contribute to increased risk to people.



1. Natural Hazards

13km deep focus	Maximum estimates say around 316,000 were killed	Illnesses in refugee camps	Half of the country's schools affected
Magnitude 7.0 on Richter scale	Already was the poorest country in western hemisphere.	A local tsunami added to the hazards of the quake	Thousands of orphaned children
300,000 people injured	Epicentre very close to the capital city Port-au-Prince	1 million made homeless	20% of people lost their jobs as a result
3 million affected	7 years later in 2017, there are still 2.5M in need of aid	\$3.1bn raised in international aid afterwards	300,000 buildings destroyed

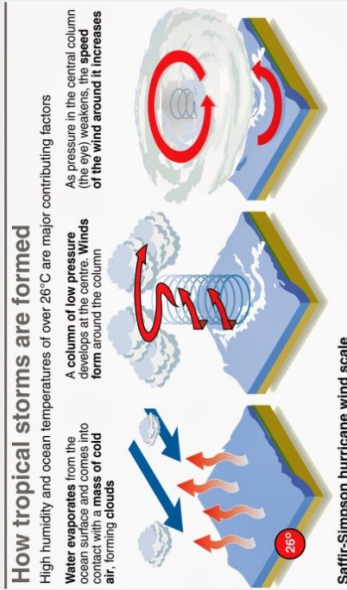
6. Haiti

2010

earthquake

example

8. Tropical storm formation



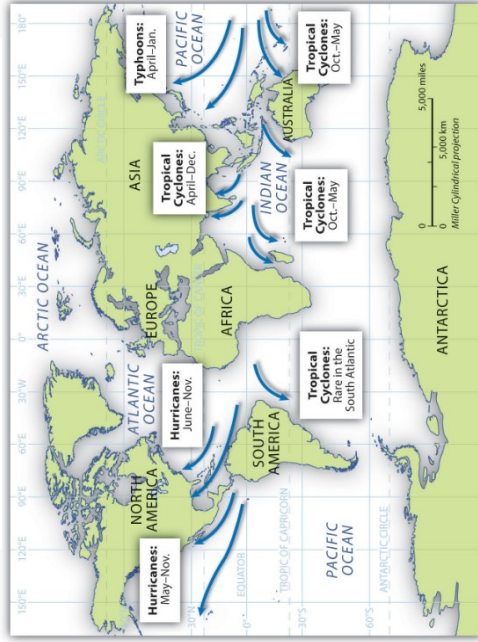
Saffir-Simpson hurricane scale

Category 1	Minimal damage	Winds 118-153 kph
Category 2	Moderate damage	Winds 154-177 kph
Category 3	Extensive damage	Winds 178-208 kph
Category 4	Extreme damage	Winds 209-251 kph
Category 5	Catastrophic	Winds 252 kph and more

Natural Hazards key terms

Natural event	natural hazard	mantle	oceanic crust	continental crust
tectonic plates	convection currents	converge	diverge	magma
volcano	Earthquake	focus	epicentre	Fault line
Richter scale	constructive margin	destructive margin	tropical storms	category
hurricanes	cyclones	typhoons	Saffir-Simpson scale	thunderstorms
storm surge	low pressure	eye	eyewall	

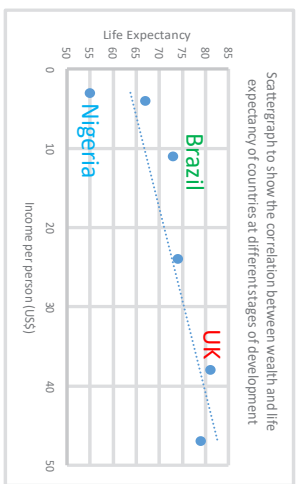
7. Tropical storm names and locations



Continental crust	Less dense that has the continents one
Oceanic crust	Dense crust under the oceans
Tectonic plates	Slabs of crust making the surface of Earth
Plate margin	A joint in the crust between two plates
Epicentre	The location on the surface above an earthquake
Focus	Origin of earthquake within the crust of Earth
magma	Molten rock in the mantle under the crust of Earth
Fault line	A weakness or crack in the crust
Seismic waves	The shockwaves given off during an earthquake

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 developed 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.

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 concerned 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

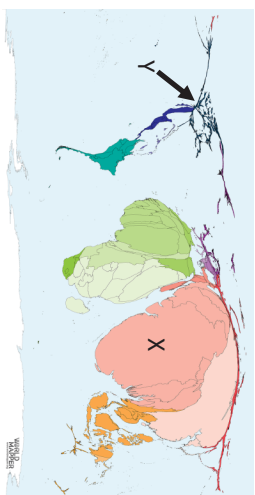


A. Global income global average per person was \$10700 in 2010. The orange countries are below this value, the blue are above. Does this represent the full reality though? (X is India and Y is USA)

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

B. Cartogram of poor access to sanitation



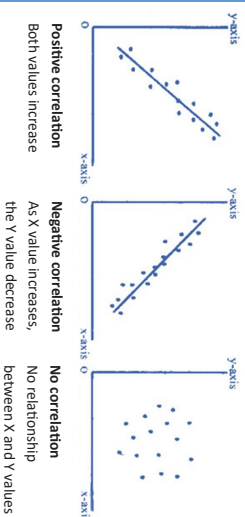
B. This cartogram is a 'distorted' map which changes the size of the countries to demonstrate the data value of the title. Country X is India—a NEE. Clearly, many citizens do not have access to toilets or safe water for hygiene. This is shown by the size of the country swelling up. Country Y is USA—a 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 shrunken too

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!



Money can't buy happiness, but it will certainly get you a better class of memories.

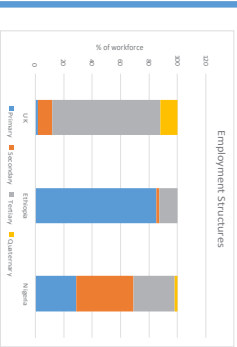
SOL or QOL?

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

The quality of life is more important than life itself.

THINGS YOU CAN'T BUY IN STORES

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.

GEOGRAPHY 8.5. GLOBALISATION

Globalisation is the process by which the world is becoming increasingly interconnected



Transport

In the past, people made epic voyages in boats. Now you can fly direct non-stop to Australia from the UK!

There are nearly 10000 planes in the sky at any given moment. It's never been so easy to travel

Global Brands

From buying Coca-Cola in Afghanistan, to McDonalds in Indonesia, you can be as far from home as you can imagine, and still find familiar things available at home.



Containerisation

The humble container—that you see on the back of lorries that rumble past—has been on an endless journey carrying goods and products around the world; from lorry to port, port to ship, ship to lorry and off again. Container technology has transformed and standardised imports and exports globally.



Migration

As people have moved all across from their country of origin, the world's enormous variety of cultures, traditions, religions, beliefs and languages have never been so interconnected into a global community; this is called multiculturalism.



Buying food

In the past, most food available was grown in Britain. Nowadays, you can buy food from all over the world in your local supermarket—at any time of year!

Communication

Within your parents' life time, communication has changed dramatically...

From letter to headline, car phone to mobile phones and text messages, internet to emails to smart phones technology, and the birth of social media; communication has never been so fast, efficient and accessible.

5. Globalisation key terms:

Consumers	People buying and using products
Manufacturers	Companies that build and create products
Retailers	Companies that sell products to consumers
TNCs	Transnational Corporations are large companies that operate in multiple countries
Development	The geographical concept and process of making economic and social progress
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
Economy	The financial position of a country. A wealthy country has a strong economy
Employment	Having a job to earn money
Employment Structure	The types of jobs people do from primary, secondary, tertiary and quaternary.
Exploitation	Taking advantage of someone or somewhere for your gains by not theirs
Sustainability	The concept of managing something successful so that it will last indefinitely

4. & 6. Transnational Corporations (TNCs)

Transnational Corporations are huge companies that operate in multiple countries across the world. Nike for example, are an American company, yet not a single Nike product is manufactured in the USA...



TNC examples:



Positives

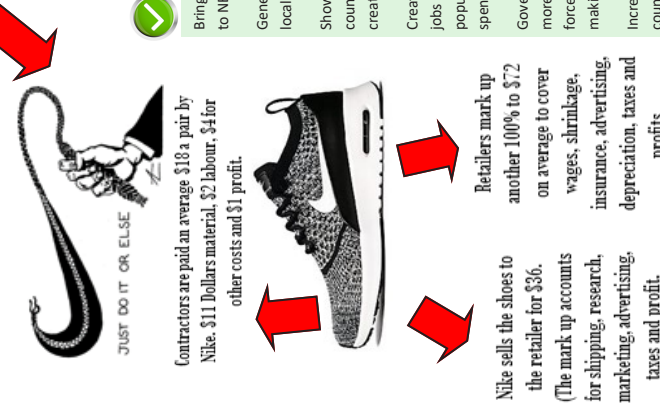
- Brings huge amounts of employment to NEEs and LICs
- Generally better pay than most other local jobs
- Shows other TNCs that the host countries are worth investing in creating more business growth
- Creates the multiplier effect—news jobs create further jobs when the population gets wealthier and start spending
- Government of host countries gains more taxes from TNCs and work force to invest in the country—making progress
- Increases the skill base in the host country



Negatives

- The profits from sales of products returns to the TNC based in the HIC
- Exploitation of workers with poor working conditions and pay in NEEs
- Environmental damage in the form of pollution and poor enforcement of laws to protect the environment
- A lack of job security—the TNC could relocate the factories with very little notice
- Business decisions made in HICs with little thought to employees working in manufacturing
- Massive amounts of water and energy used by the host country
- Local culture can be damaged by global brands changing peoples' ideas

6. The maker of your trainers earns \$1 a shoe...



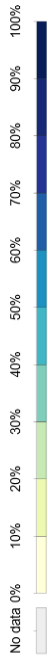
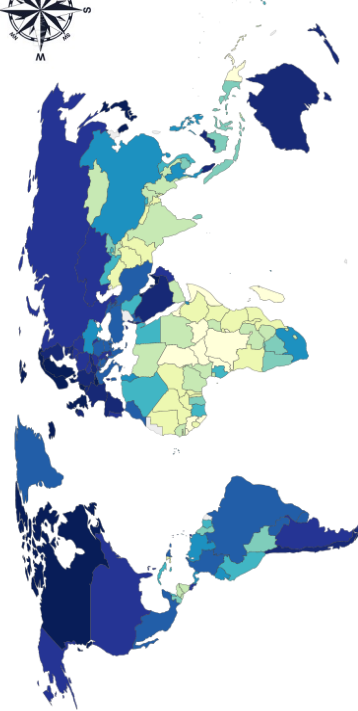
A choropleth map showing what % of the population accesses the internet

Share of the population using the Internet, 2017

All individuals who have used the internet in the last 3 months are counted as internet users. The internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc.



A choropleth map uses ever-darker colours to show an increase in a value of something in a given area; in this case, the percentage of people with access to the internet within each country. With the average being known for each country, comparisons can be made across the world.



Source: World Bank

OurWorldinData.org/technology-adoption/ • CC BY

GEOGRAPHY COMMAND WORDS

ADDITIONAL

EXAM SKILLS

Command

How do I respond in my writing?

Annotate
Annotations are extended labels. When annotating, you should write brief descriptive or explanatory sentences linked to features referenced in the question.

Assess
Like analyse, assess means to break the theme of the question down into parts but offer your opinion on the successes and failures to reach an informed judgement.

Calculate
You need to use the data (numbers) within the question, or resource that the question is based on, and apply a mathematical function to get your answer.

Compare
An effective comparison will make clear references to both similarities and differences between the items within the questions.

Complete
You are directed to use information available to you (a resource with the question or your knowledge) to finish a task. This is most commonly linked to cloze paragraphs (a.k.a. gap-fill) style questions.

Contrast
Writing to show contrast will make clear references to just differences between the items within the questions.

Describe
Write details of what the feature/item or theme are like within the question. Do not explain as a description requires no explanation.

Discuss
Describe and explain a balance of the similarities and differences, or positives and negatives of whatever the question is about. Evidence is important to include—as is your opinion. Always add a conclusion to summarise your discussion.

Draw
Using a pencil, produce a simple diagram (plan view/cross-section/field sketch or box style) of the theme within the question. Quite often, you will be asked to label or annotate your drawing too.

Evaluate
Systematically break down the theme of the question to make an informed judgement supported by evidence for the strengths, weaknesses (or limitations) opportunities to improve a way of working or concept, to reach conclusions.

Explain
Give reasons for why something is like it is. Write in a way that shows cause and effect. The words 'because', '...as a result', '...this is due to', 'consequently' should be in your writing.

Identify
Identify the name of a feature or item referenced in the question. Synonyms are: give/name or state.

Label
Labelling is simply naming features or parts of something; these are not sentences.

Justify
Write a convincing argument to reach a conclusion supported by evidence.

Outline
Give a brief overview of the whole theme of the question. You can describe or explain just the main points in limited detail. The amount you write depends on the amount of content within the question.

Plot
Add data (results or values) onto a graph. Read the axis labels carefully to understand the units. If present, your plotted data should 'look' like the other data already present on the graph.

Suggest
Explain a possible reason for theme of the question. 'Suggest' questions are asking you to put forward an idea you have.

To what extent
The question is asking how far you agree with something—from fully agree to totally disagree—often a statement or a quote for example. Give your opinion immediately and examine arguments that support and discount your opinion. Support with evidence to reach a conclusion.

GEOGRAPHY ASSESSMENT OBJECTIVES

AO1
Demonstrate **knowledge** of location, places, processes, patterns, environments at different scales

AO2
Demonstrate geographical **understanding** of concepts and how they are used in relation to places, environments and processes; interrelationships between places, environments and processes.

AO3
Application of knowledge and understanding to interpret, analyse and evaluate information and issues to make judgements.

AO4
Select, adopt and use a variety of **skills** and techniques to investigate questions and issues and communicate finding.

Assessment Objectives are the ways that your knowledge of the subject could be assessed using the command words. For example, the command word 'explain' would be AO2, and 'evaluate' would be AO3.

'Study figure X...'
The majority of questions in geography GCSE exam papers have a linked resource for you to include in your answer - such as photo, graph, map, diagram of set of data. Before you even get to the question, you are commanded to '**study**' the resource; they've essentially given you something to use in your answer—so study it well to find the best bits to include!

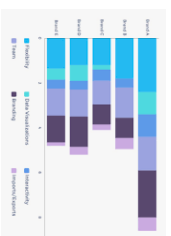
Examples of 'Figures' in exams:



Photos



Maps



Diagrams
Graphs



'Using a case study or an 'example you have studied...'

When commanded to '**use an example**' in a question response, you must try to link your knowledge to a real world example as evidence to demonstrate that you have understand beyond just a theory or idea.

In addition to learning lots of 'examples' at GCSE level, you will learn a small selection of detailed 'case studies'; these cover knowledge of specific important geographical events or phenomena, or important places. Unlike 'examples', you will definitely get examined on your knowledge of 'case studies' at GCSE level

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 Edgehill (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.

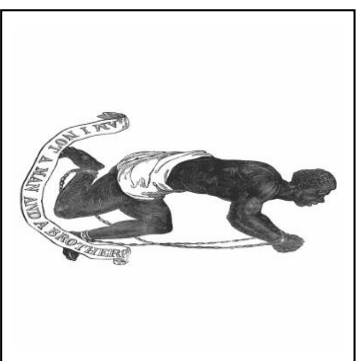
History Year 8 Knowledge Organiser: Spring Term

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

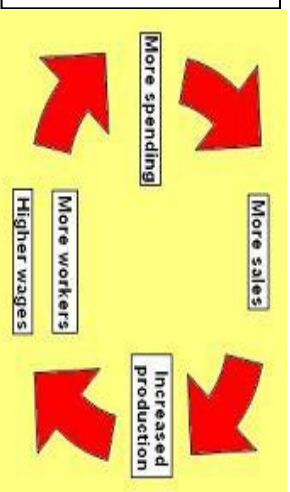


3) Industrial Revolution 1750-1900 (A time of great change for Britain)

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 of 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

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

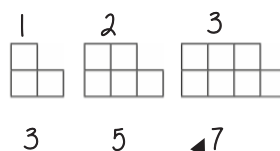
0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms.



Sequence in a table and graphically

Position: the place in the sequence



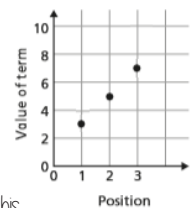
Term: the number or variable (the number of squares in each image)

In a table

Position	1	2	3
Term	3	5	7

+2 +2

Graphically



Because the terms increase by the same addition each time this is **linear** – as seen in the graph

Sequences from algebraic rules

This is substitution!

$$3n + 7$$

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

$$2n - 5$$

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 = $2(100) - 5 = 195$

$$3n^2 + 7$$

This is not linear as there is a power for n

Checking for a term in a sequence

Form an equation

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

$$3n - 4 = 201$$

Algebraic rule Term to check

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

$$2n^2$$

2 times whatever n squared is

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

$$(2n)^2$$

2 times n then square the answer

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

H Finding the algebraic rule

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

$$4n$$

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

YEAR 8 - REASONING WITH ALGEBRA...

Straight Line Graphs

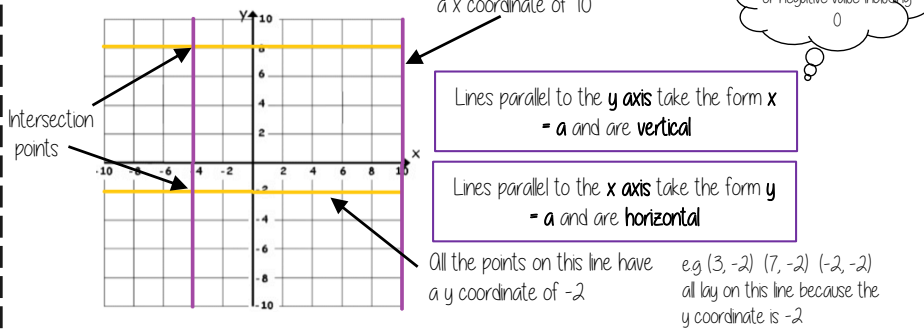
What do I need to be able to do?

- By the end of this unit you should be able to:
- Compare gradients
 - Compare intercepts
 - Understand and use $y = mx + c$
 - Find the equation of a line from a graph
 - Interpret gradient and intercepts of real-life graphs

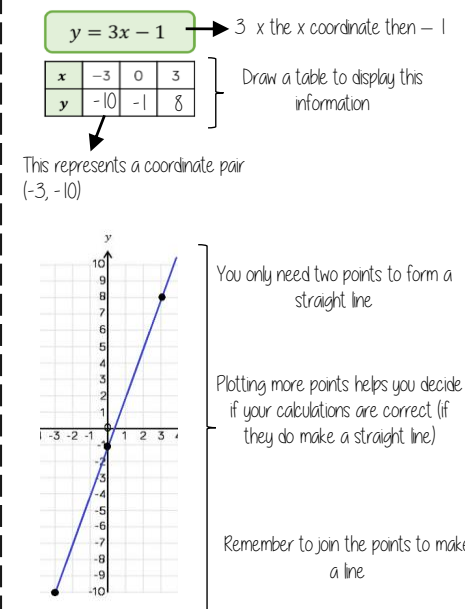
Keywords

- Gradient:** the steepness of a line
Intercept: where two lines cross. The y-intercept: where the line meets the y-axis.
Parallel: two lines that never meet with the same gradient.
Co-ordinate: a set of values that show an exact position on a graph.
Linear: linear graphs (straight line) – linear common difference by addition/ subtraction
Asymptote: a straight line that a graph will never meet.
Reciprocal: a pair of numbers that multiply together to give 1.
Perpendicular: two lines that meet at a right angle.

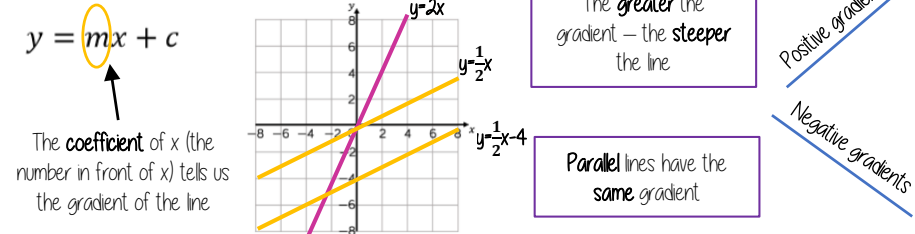
Lines parallel to the axes



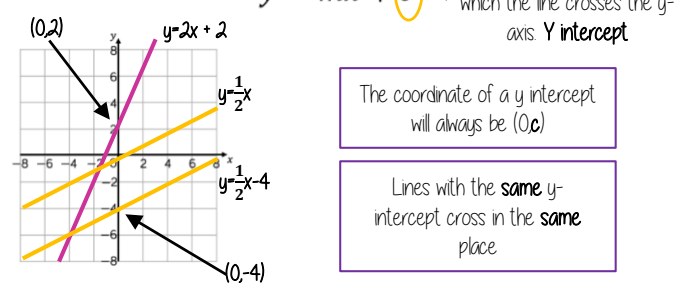
Plotting $y = mx + c$ graphs



Compare Gradients



Compare Intercepts



$y = mx + c$

The coefficient of x (the number in front of x) tells us the gradient of the line

The value of c is the point at which the line crosses the y-axis. Y intercept

y and x are coordinates

The equation of a line can be rearranged. Eg

$y = c + mx$

$c = y - mx$

Identify which coefficient you are identifying or comparing

Real life graphs

A plumber charges a £25 callout fee, and then £12.50 for every hour. Complete the table of values to show the cost of hiring the plumber.

Time (h)	0	1	2	3	8
Cost (£)	£25				£125

In real life graphs like this values will always be positive because they measure distances or objects which cannot be negative.

Direct Proportion graphs

To represent direct proportion the graph must start at the origin

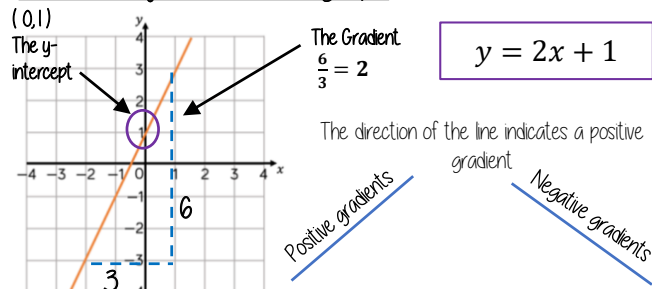
A box of pens costs £2.30 Complete the table of values to show the cost of buying boxes of pens.

Boxes	0	1	2	3	8
Cost (£)		£2.30			

When you have 0 pens this has 0 cost
The gradient shows the price per pen

The y-intercept shows the minimum charge.
The gradient represents the price per mile

Find the equation from a graph



YEAR 8 - REPRESENTATIONS...

Working in the Cartesian plane

What do I need to be able to do?

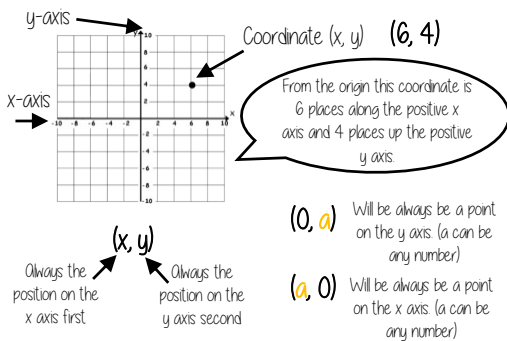
By the end of this unit you should be able to:

- 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

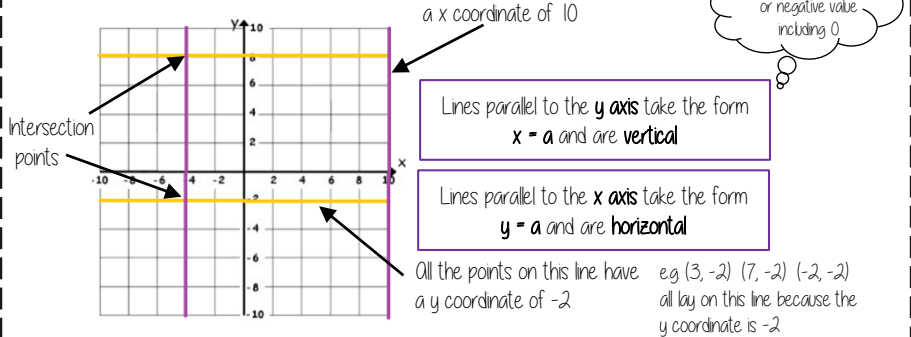
Keywords

- 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

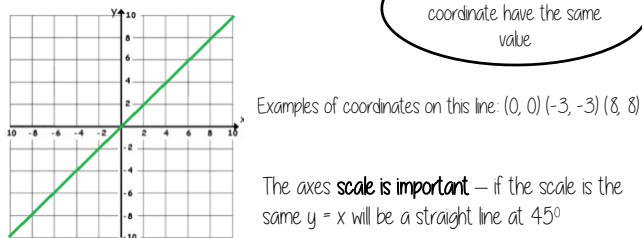
Coordinates in four quadrants



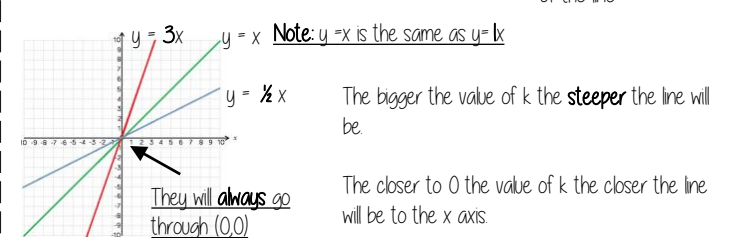
Lines parallel to the axes



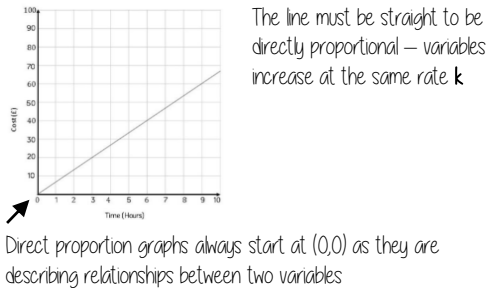
Recognise and use the line $y=x$



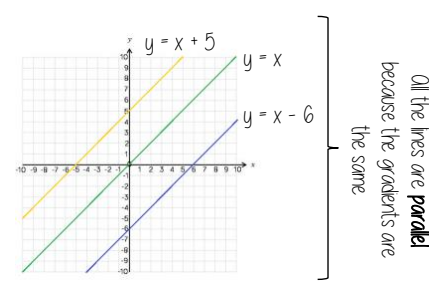
Recognise and use the lines $y=kx$



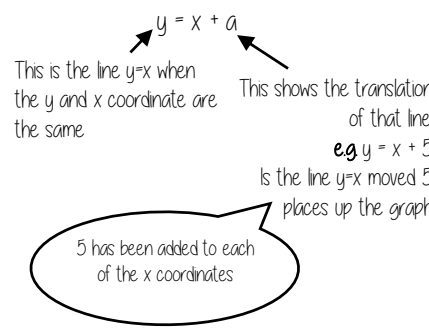
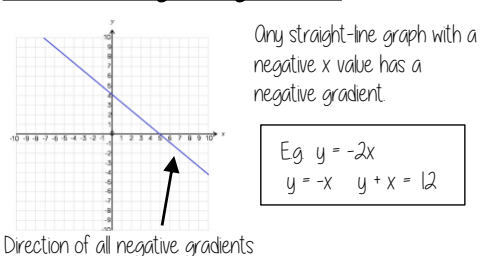
Direct Proportion using $y=kx$



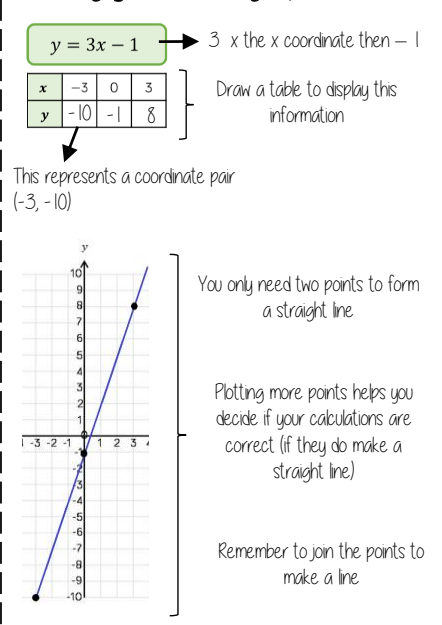
Lines in the form $y = x + a$



Lines with negative gradients



Plotting $y = mx + c$ graphs



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

Acute Angles
 $0^\circ < \text{angle} < 90^\circ$

Right Angles
 90°

Obtuse
 $90^\circ < \text{angle} < 180^\circ$

Reflex
 $180^\circ < \text{angle} < 360^\circ$

Straight Line
 180°

Right angle notation

The letter in the middle is the angle
 The arc represents the part of 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.

Vertically opposite angles
 Equal

Angles around a point
 360°

Parallel lines

Still remember to look for angles on straight lines, around a point and vertically opposite!

Lines OF and BE are transversals (lines that bisect the parallel lines)

Corresponding angles often identified by their "F shape" in position

Alternate angles often identified by their "Z shape" in position

This notation identifies parallel lines

Alternate/ Corresponding angles

Because alternate angles are equal the highlighted angles are the same size

Because corresponding angles are equal the highlighted angles are the same size

Co-interior angles

Because co-interior angles have a sum of 180° the highlighted angle is 110°

As angles on a line add up to 180° co-interior angles can also be calculated from applying alternate/ corresponding rules first

Triangles & Quadrilaterals

Side, Angle, Angle

Side, Angle, Side

Side, Side, Side

Link to steps **R**

Properties of Quadrilaterals

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

Rectangle
 All angles 90°
 Opposite sides are parallel

Rhombus
 All sides equal size
 Opposite angles are equal

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

Trapezium
 One pair of parallel lines

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

Sum of exterior angles

Exterior angles all add up to 360°

Using exterior angles

Interior angle + Exterior angle = straight line = 180°
 Exterior angle = $180 - 165 = 15^\circ$

Number of sides = $360^\circ \div \text{exterior angle}$
 Number of sides = $360 \div 15 = 24$ sides

Sum of interior angles

Interior Angles
 The angles enclosed by the polygon

$(\text{number of sides} - 2) \times 180$

Sum of the interior angles = $(5 - 2) \times 180$

This shape can be made from three triangles
 Each triangle has 180°

Sum of the interior angles = $3 \times 180 = 540^\circ$

Remember this is all of the interior angles added together

This is an **irregular** polygon - the sides and angles are different sizes

Missing angles in regular polygons

Exterior angle = $360 \div 8 = 45^\circ$

Interior angle = $\frac{(8-2) \times 180}{8} = \frac{6 \times 180}{8} = 135^\circ$

Exterior angles in regular polygons = $360^\circ \div \text{number of sides}$

Interior angles in regular polygons = $\frac{(\text{number of sides} - 2) \times 180}{\text{number of sides}}$

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:

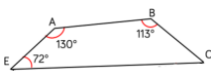
- Use letter and labelling conventions
- Draw and measure line segments and angles
- Identify parallel and perpendicular lines
- Recognise types of triangle
- Recognise types of quadrilateral
- Identify polygons
- Construct triangles (SAS, SSS, ASA)
- Draw Pie charts

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 sides 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

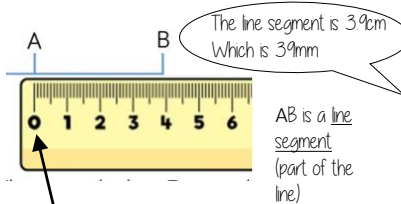


Angle Notation: three letters ABC
 This is the angle at B = 113°

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

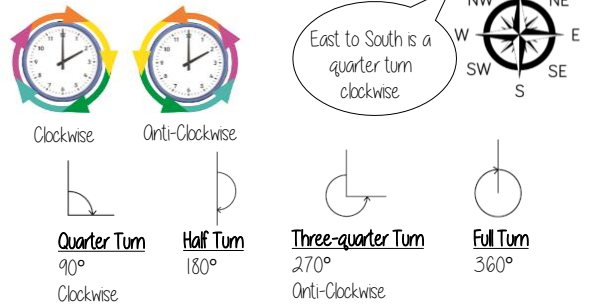
Draw and measure line segments

Conversions: $1\text{cm} = 10\text{mm}$, $1\text{m} = 100\text{cm}$

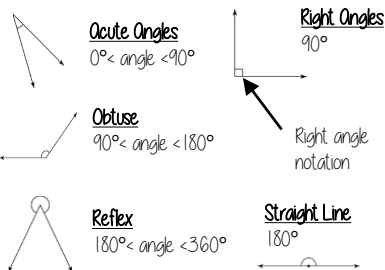


Make sure the start of the line is at 0.

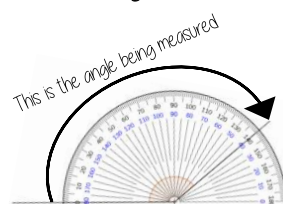
Angles as measures of turn



Classify angles



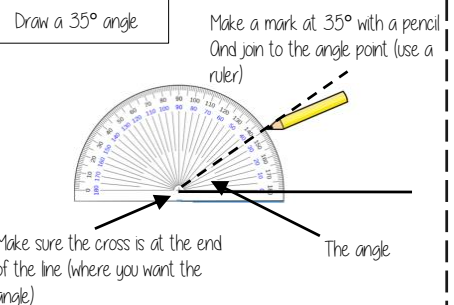
Measure angles to 180°



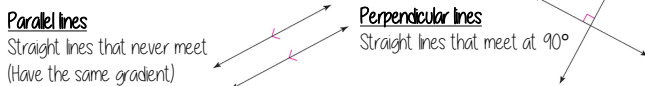
This is the angle being measured
 The base line follows the line segment
 Make sure the cross is at the point the two lines meet

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

Draw angles up to 180°

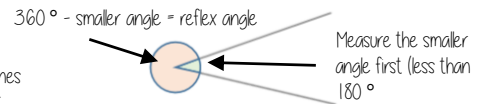


Parallel and Perpendicular lines

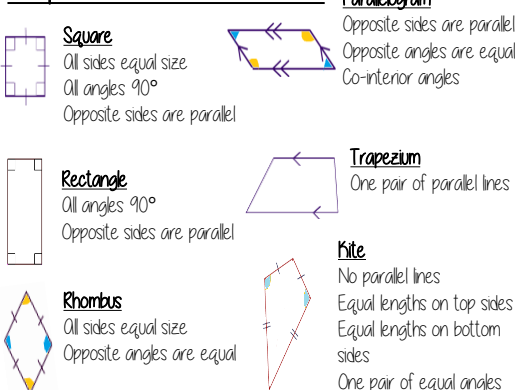


Angles over 180°

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



Properties of Quadrilaterals



Draw Pie Charts

Type of pet	Dog	Cat	Hamster
Frequency	32	25	3

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

This fraction of the 360 degrees represents dogs

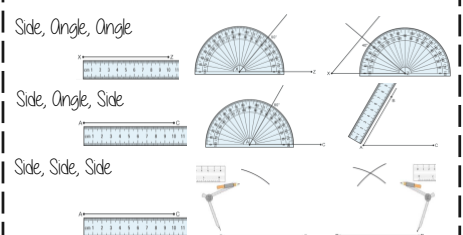
$$\frac{32}{60} \times 360 = 192^\circ$$

Use a protractor to draw
 This is 192°

Polygons

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

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

●●●● Arrays can help represent factors ●●●●●●●●●●

●●●●●●●● Factors of 10 10 x 1 or 1 x 10
 5 x 2 or 2 x 5 1, 2, 5, 10

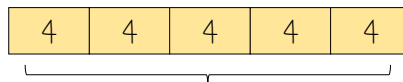
The number itself is always a factor

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

Be strategic - Lay factors out in pairs can help you not to miss any

Multiples

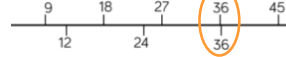


Bar models can represent by something is a multiple. Eg 20 is a multiple of 4

Lowest Common Multiples

- LCM of 9 and 12**
- 9: 9, 18, 27, 36, 45, 54
 12: 12, 24, 36, 48, 60

The first time their multiples match LCM = 36



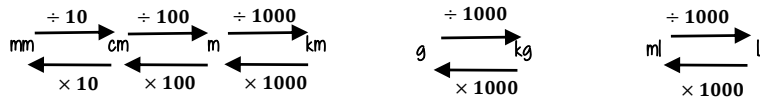
Multiply/ Divide by powers of 10

3 x 100 = 300
 0.03 x 100 = 3

Repeated multiplication and division by powers of 10 is commutative
 ÷ 10 then ÷ 10 → ÷ 100

Metric conversions

Useful Conversions



Multiplication methods

Long multiplication (column)

Grid method

Repeated addition

Less effective method especially for bigger multiplication

Multiplication with decimals

Perform multiplications as integers e.g. $0.2 \times 0.3 \rightarrow 2 \times 3$

Make adjustments to your answer to match the question: $0.2 \times 10 = 2$
 $0.3 \times 10 = 3$

Therefore $6 \div 100 = 0.06$

Estimations: Using estimations allows a 'check' if your answer is reasonable

Division methods

$3584 \div 7 = 512$

Short division

Complex division

$\div 24 = \div 6 \div 4$
 Break up the divisor using factors

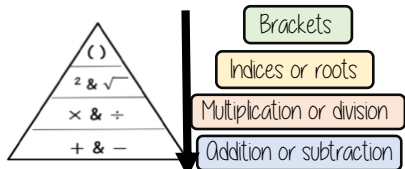
Division with decimals

The placeholder in division methods is essential - the decimal lines up on the dividend and the quotient

$24 \div 0.02 \rightarrow 24 \div 0.2 \rightarrow 240 \div 2$

All give the same solution as represent the same proportion
 Multiply the values in proportion until the divisor becomes an integer

Order of operations



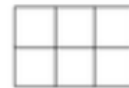
If you have multiple operations from the same tier work from left to right

eg $10 - 3 + 5 \rightarrow 10 - 3 \rightarrow 7 + 5$

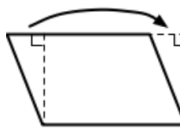
$6 \times 4 + 8 \times 2$
 24 + 16 = 40

Area problems

Rectangle
 Base x Perpendicular height



Parallelogram/ Rhombus
 Base x Perpendicular height



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



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

Mean problems

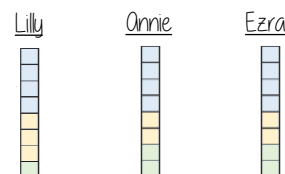
Mean - a measure of average
 It gives an idea of the central value

Lilly, Annie and Ezra have the following cubes

Lilly: 8 cubes
 Annie: 8 cubes
 Ezra: 8 cubes

24 in total

Finding the mean amount is the average amount each person would have if shared out equally



The mean number of blocks would be 8 each

YEAR 8 - DIRECTED NUMBER

Operations with equations and directed numbers

What do I need to be able to do?

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

- 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)

Perform calculations that cross zero

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

Use the number line to guide subtraction of 6

$4 - 6 = -2$

Start at 4

Find the difference between 6 and -4

From 6 to 0
6
From 0 to -4
4
10 beads between them

Rearrangements of the same equation

$-5 + 5 = 0$

$5 - 5 = 0$

Add directed numbers

$2 + -4 = -2$

Representations

Zero pair $(-1 + 1 = 0)$

Two -1 's left $= -2$

$8 + -3 = 5$

Partitioning

$8 + -3 = 5$

$5 + 3 + -3 = 5$

Partition the value to create a zero pair calculation

Generalisation

$+ - = -$

Subtract directed numbers

Representation for calculation

"Subtract" - means take away or remove

$2 - -1 = 3$

Take away one

Start with the representation of 2

Generalisation

$- - = +$

Multiply/ Divide directed numbers

Two representations of the same calculation

$2 \times -3 = -6$

Negative, Negative calculation

-2×-3

This is the negative of 2×-3

The act of making counters into their negative is turning them over

$-2 \times -3 = 6$

Divisions are the inverse operations

Evaluate algebraic expressions

$a = 5$

$b = -4$

$a^2 = 5^2$

$a^2 = 25$

$b^2 = (-4)^2$

$b^2 = 16$

With negative numbers the brackets are important so that it performs -4×-4 .

Brackets around negative substitutions helps remove calculation errors

$2a - b = 2 \times 5 - (-4) = 10 + 4 = 14$

$3b - 2a = 3(-4) - 2(5) = -12 - 10 = -22$

Two-step equations

Bar Model

$4x + 2 = 10$

Representing the same question (use fact families)

$10 - 4x = 2$

Function machine

$x \rightarrow x4 \rightarrow +2 \rightarrow 10$

Inverse operations to find x

Use order of operations

Brackets

Indices or roots

Multiplication or division

Addition or subtraction

Remember square roots have a positive and negative value

x	-3	-2	-1	0	1	2	3
-3	9	6	3	0	-3	-6	-9
-2	6	4	2	0	-2	-4	-6
-1	3	2	1	0	-1	-2	-3
0	0	0	0	0	0	0	0
1	-3	-2	-1	0	1	2	3
2	-6	-4	-2	0	2	4	6
3	-9	-6	-3	0	3	6	9

YEAR 8 - PROPORTIONAL REASONING...

Multiplying and Dividing Fractions

What do I need to be able to do?

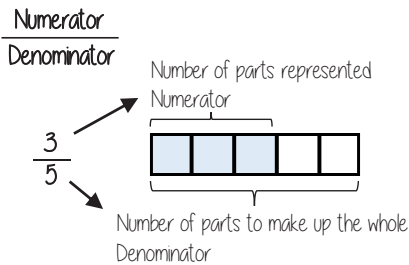
- By the end of this unit you should be able to:
- Carry out any multiplication or division using fractions and integers.
 - Solutions can be modelled, described and reasoned.

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.

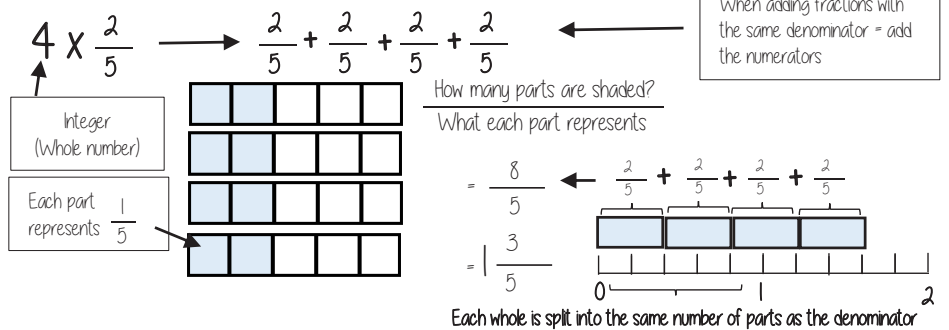


Representing a fraction

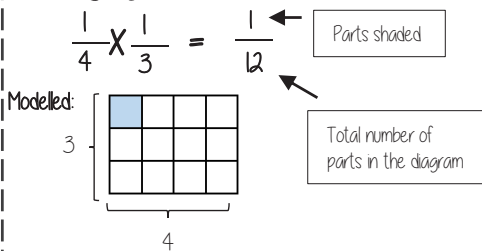


ALL PARTS of a fraction are of equal size

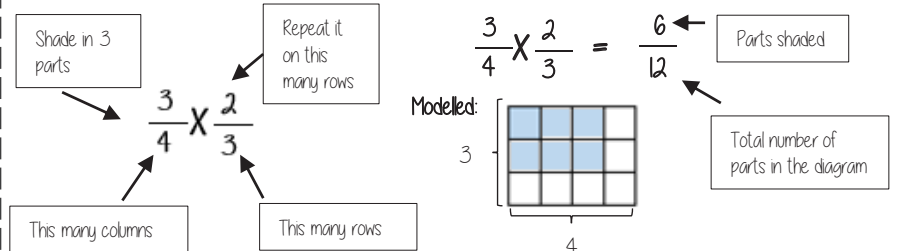
Repeated addition = multiplication by an integer



Multiplying unit fractions



Multiplying non-unit fractions



Quick Multiplying and Cancelling down

$\frac{1}{\cancel{3}} \times \frac{4}{\cancel{9} \times 3}$

The 3 and the 9 have a common factor and can be simplified

Quick Solving

Multiply the numerators
Multiply the denominators

$\frac{1 \times 4}{5 \times 3} = \frac{4}{15}$

The reciprocal

When you multiply a number by its reciprocal the answer is always 1

$3 \times \frac{1}{3} = 1$

$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$

The reciprocal of 3 is $\frac{1}{3}$ and vice versa

Reciprocals for division

e.g. $5 \div \frac{1}{4} = 20$
 $5 \times 4 = 20$

Multiplying by a reciprocal gives the same outcome

Dividing an integer by a unit fraction



$1 \div \frac{1}{4} = 4$

How many quarters are in 1?

"There are 4 quarters in 1 whole.
Therefore, there are 20 quarters in 5 wholes"

$5 \div \frac{1}{4} = 20$

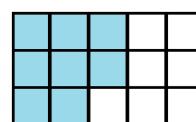
Dividing any fractions

Remember to use reciprocals

$\frac{2}{5} \div \frac{3}{4}$
 $\frac{2}{5} \times \frac{4}{3}$

Multiplying by a reciprocal gives the same outcome

Represented



$= \frac{8}{15}$

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 – ODD

Less than/ difference – SUBTRACT

e.g 4 more than t \longrightarrow $t + 4$
 8 less than k \longrightarrow $k - 8$

Only similar terms can be grouped together

e.g Find the perimeter of this shape
 (Perimeter = length around outside of shape)



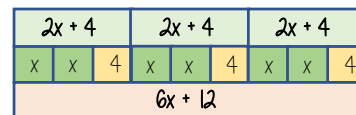
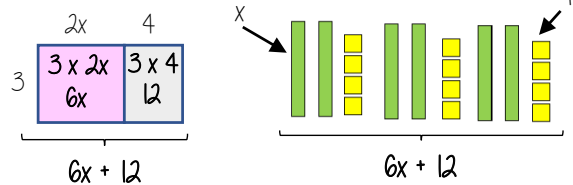
$t + 2t + 1 + t + 2t + 1 \longrightarrow 6t + 2$

Directed numbers

$++ \longrightarrow +$
 $-- \longrightarrow +$
 $+ - \longrightarrow -$
 $- + \longrightarrow -$

e.g $a = -5$ and $b = 2$
 $a^2 = a \times a = -5 \times -5 = 25$
 $b + a = 2 + -5 = -3$

Multiply single brackets



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

Factorise into a single bracket

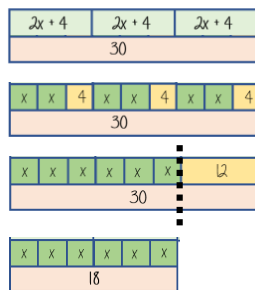


The two values multiply together (also the area) of the rectangle

$8x + 4 \equiv 4(2x + 1)$

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

$6x = 18$

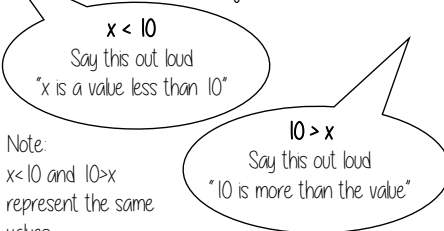
-6

Substitute to check your answer.
 This could be negative or a fraction or decimal

$\frac{x}{3} \quad x = 3$

Simple Inequalities

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



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

$x \longrightarrow \times 3 \longrightarrow +2 \longrightarrow 11$

$3x + 2 > 11$

Solve

$x \longleftarrow -3 \longleftarrow -2 \longleftarrow 11$

$x > 3$

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 e.g 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

$$6x + 12 = 30$$

$$-12 \quad -12$$

$$6x = 18$$

$$-6 \quad -6 \quad x = 3$$

Form and solve inequalities

Two more than treble my number is greater than 11

Find the possible range of values

$$3x + 2 > 11$$

Solve

$$x \leftarrow -3 \leftarrow -2 \leftarrow 11$$

$$x > 3$$

Inequalities with negatives

Method 1 Make x positive first

$$2 - 3x > 17$$

$$+3x \quad +3x$$

$$2 > 17 + 3x$$

$$-17 \quad -17$$

$$-15 > 3x$$

$$\div 3 \quad \div 3$$

$$-5 > x$$

x is true for any value smaller than -5

CHECK IT!
 $2 - 3(-6) = 20$
TRUE/ CORRECT

Equations with unknown on both sides

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

$$-3x \quad -3x$$

$$x + 5 = 24$$

$$-5 \quad -5$$

$$x = 19$$

Inequalities with unknown on both sides

Solving inequalities has the same method as equations

$$5(x + 4) < 3(x + 2)$$

$$5x + 20 < 3x + 6$$

$$2x + 20 < 6$$

$$2x < -14$$

$$x < -7$$

Check it!

$$5(-8 + 4) < 3(-8 + 2)$$

$$5(-4) < 3(-6)$$

$$-20 < -18$$

✓ -20 IS smaller than -18

Method 2 Keep the negative x

$$2 - 3x > 17$$

$$-2 \quad -2$$

$$-3x > 15$$

$$\div -3 \quad \div -3$$

$$x > -5$$

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

Substitute in values

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

$$y \rightarrow +z \rightarrow x$$

$$y \leftarrow -z \leftarrow x$$

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)

$$4x - 3 = 9$$

$$+3 \quad +3$$

$$4x = 12$$

$$\div 4 \quad \div 4$$

$$x = 3$$

In a formula (make x the subject)

$$xy - s = a$$

$$+s \quad +s$$

$$xy = a + s$$

$$\div y \quad \div y$$

$$x = \frac{a + s}{y}$$

The steps are the same for solving and rearranging

Rearranging is often needed when using $y = mx + c$

e.g 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

Pi (π): The ratio of a circle's circumference to its diameter.

Perpendicular: At an angle of 90° to a given surface

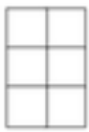
Formula: A mathematical relationship/ rule given in symbols. E.g $b \times h = \text{area of rectangle/ square}$

Infinity (∞): A number without a given ending (too great to count to the end of the number) – never ends

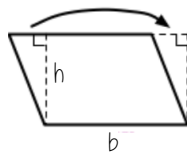
Sector: A part of the circle enclosed by two radii and an arc.

Area – rectangles, triangles, parallelograms

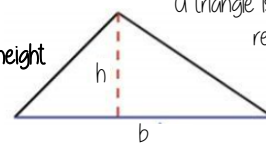
Rectangle
Base x Height



Parallelogram/ Rhombus
Base x Perpendicular height



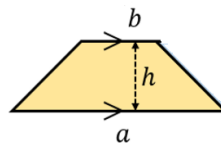
Triangle
 $\frac{1}{2} \times \text{Base} \times \text{Perpendicular height}$



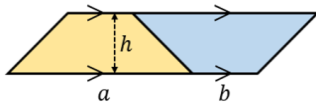
A triangle is half the size of the rectangle it would fit in

Area of a trapezium

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



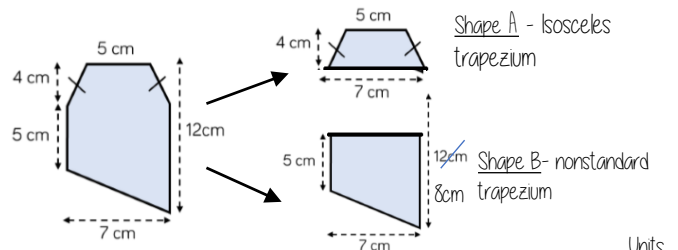
Why?



- Two congruent trapeziums make a parallelogram
- New length $(a + b) \times \text{height}$
- 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.



Shape A + Shape B = total area

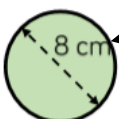
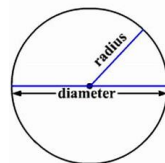
$$\frac{(5+7) \times 4}{2} + \frac{(5+7) \times 8}{2} = 24 + 45.5 = 69.5 \text{ cm}^2$$

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)

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



Diameter = 8cm
 \therefore Radius = 4cm

$$\begin{aligned} \pi \times \text{radius}^2 \\ = \pi \times 4^2 \\ = \pi \times 16 \\ = 16\pi \text{ cm}^2 \end{aligned}$$

Find the area of one quarter of the circle



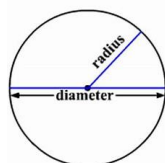
Circle Area = $16\pi \text{ cm}^2$
Quarter = $4\pi \text{ cm}^2$

Area of a circle (Calculator)



SHIFT $\times 10^x$

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



How to get π symbol on the calculator

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.

$$\begin{aligned} \text{Arc lengths} &= \pi \times 64 \\ &= 64\pi \end{aligned}$$

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

Arc lengths + Straight lengths = total perimeter

$$\begin{aligned} &= 64\pi + 150 + 150 \\ &= (300 + 64\pi) \text{ m} \\ \text{OR} &= 501.1 \text{ m} \end{aligned}$$

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

YEAR 8 - CONSTRUCTING IN 2D/3D

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

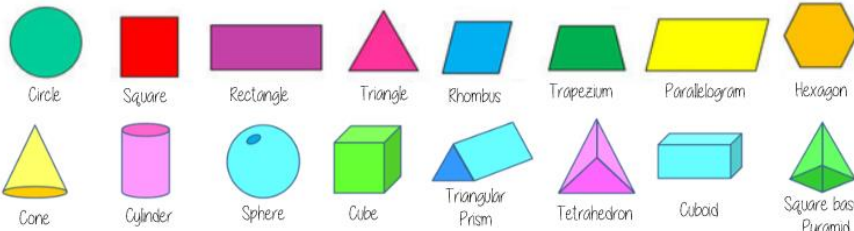
Face: a flat surface on a solid object

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)

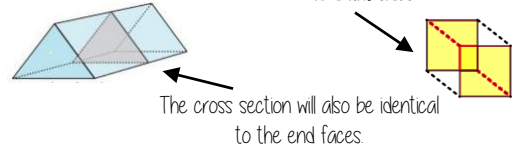
Perspective: a way to give illustration of a 3D shape when drawn on a flat surface.

Name 2D & 3D shapes



Recognise prisms

A solid object with two identical ends and flat sides

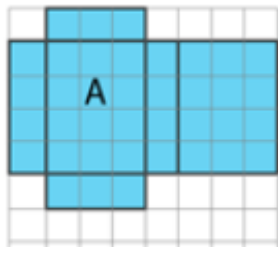
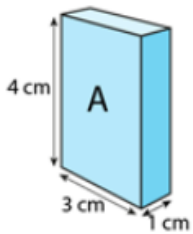


The cross section will also be identical to the end faces



A cylinder although with very similar properties does not have flat faces so is not categorised as a prism

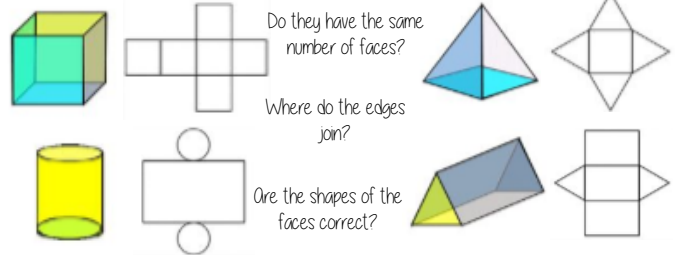
Nets of cuboids



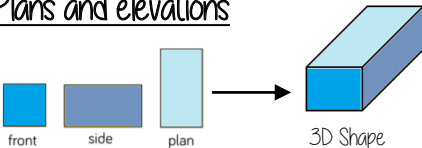
1cm grids help to draw accurately

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

Sketch and recognise nets



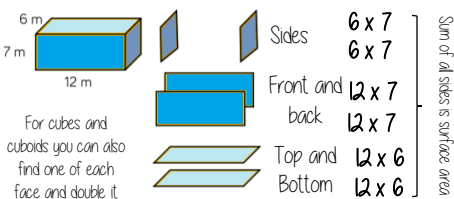
Plans and elevations



The direction you are considering the shape from determines the front and side views

Surface area

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



For cubes and cuboids you can also find one of each face and double it



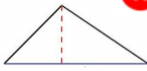
For other shapes - not all the sides are the same, so calculate the individually

Area of 2D shapes

Rectangle
Base x Height



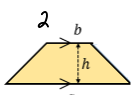
Triangle
 $\frac{1}{2} \times \text{Base} \times \text{Perpendicular height}$



Parallelogram/ Rhombus
Base x Perpendicular height



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



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



Surface area - cylinders



The area of the circle
 $\pi \times \text{radius}^2$

The width of this face is the same as the circumference
 $\pi \times \text{diameter} \times \text{height}$

$$2 \times \pi \times \text{radius}^2 + \pi \times \text{diameter} \times \text{height}$$

Volumes

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



Counting cubes

Some 3D shape volumes can be calculated by counting the number of cubes that fit inside the shape

$$\text{Cubes/ Cuboids} = \text{base} \times \text{width} \times \text{height}$$

Remember multiplication is commutative



Cross section



Cross section

$$\text{Prisms and cylinders} = \text{area cross section} \times \text{height}$$

Height can also be described as depth

Areas - square units
Volumes - cube units

Areas and volumes can be left in terms of pi π

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

$\frac{70}{100}$ → This also means 70 - 100 → 70 out of 100 squares → 70 "hundredths" = 7 "tenths" = 0.7 → 70 hundredths = 70%

Using a calculator → $\frac{70}{100}$ → S=D → Convert to a decimal → × 100 converts to a percentage

Be careful of recurring decimals
 e.g. $\frac{1}{3} = 0.333333$
 $\frac{3}{10} = 0.3$
 The dot above the 3

Fraction/ Percentage of amount

R

Find $\frac{3}{5}$ of £60

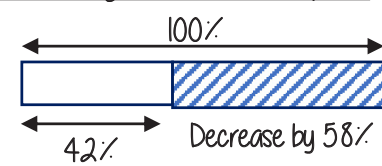
$\frac{3}{5}$ of £60 = £36
 Remember $\frac{3}{5} = 60\% = 0.6$
 10% of £60 = £6
 50% of £60 = £30
 60% of £60 = £36
 60% of £60 = $0.6 \times 60 = £36$

Convert FDP < and > 100%

100 hundredths 10 tenths 100% → 40 hundredths 4 tenths 40% → 140 hundredths 14 tenths 140%

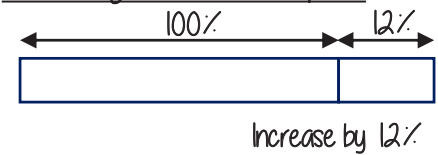
$100\% + 40\% = 1 + 0.40 = 1.40$

Percentage decrease: Multipliers



$100\% - 58\% = 42\%$
 $100 - 0.58 = 0.42$ ← Multiplier Less than 1

Percentage increase: Multipliers



$100\% + 12\% = 112\%$
 $100 + 0.12 = 1.12$ ← Multiplier More than 1

Express as a % - Non-calculator

Percent – per hundred

$\frac{7}{10}$ → 7 per every 10 are orange → This means that 70 per every 100 are orange → $\frac{70}{100}$ → 70%

$\frac{27}{50}$ → 27 per every 50 shaded → 54 per every 100 shaded → $\frac{54}{100}$ → 54%

Denominator 100 Equivalent fractions

Express as a % - Calculator

Rosie

$\frac{13}{30}$ → $\frac{13}{30}$ → × 100 → 43.3333...% → 43%

Can't use equivalence easily to find 'per hundred'

This the same as 13 - 30

Decimal percentages are still a percentage.

Percentage change

I bought a phone for £200. A year later sold it for £125.

$\frac{75}{200} \times 100 = 37.5\%$ → Percentage loss

I bought a house for £180,000, I later sold it for £216,000.

$\frac{36000}{180000} \times 100 = 20\%$ → Percentage profit

Difference in value × 100 / Original value

Choose appropriate method

The language and wording of the question is the key.

Have you represented the question in a bar model? Can you use a calculator?

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



4 cans of pop = £2.40

4 cans of pop = £2.40
 $\times 0.5$ → 2 cans of pop = £1.20
 $\times 3$ → 12 cans of pop = £7.20

This is a multiplicative change

4 cans of pop = £2.40
 $\times 3$ → 12 cans of pop = £7.20

This multiplier is the same in the same way that this would be for ratio

Sometimes this is easiest if you work out how much one unit is worth first
 e.g. 1 can of pop = £0.60

Conversion Graphs

Compare two variables

R



This is always a straight line because as one variable increases so does the other at the same rate

To make conversions between units you need to find the point to compare – then find the associated point by using your graph. Using a ruler helps for accuracy. Showing your conversion lines help as a "check" for solutions

Inverse Proportion

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

Examples of inversely proportional relationships

Time taken to fill a pool and the number of taps running

Time taken to paint a room and the number of workers

T is inversely proportional to G. When T=2 then G=20

T	1	2	8
G	40	20	5

$\div 2$ (from 1 to 2) $\times 4$ (from 2 to 8)
 $\times 2$ (from 40 to 20) $\div 4$ (from 20 to 5)

Best Buys

Have a directly proportional relationship

To calculate best buys you need to be able to compare the cost of one unit or units of equal amounts



Shop A

4 cans for £1.20

↓ $\frac{£1.20}{4}$

1 can is £0.30
Or 30p

Shop B

3 cans for 93p

↓ $\frac{£0.93}{3}$

1 can is £0.31
Or 31p

Cost per item

Shop A is the best value as it is 1p cheaper per can of pop



Shop A

4 cans for £1.20

↓ $\frac{£1.20}{4}$

£1 buys 3.333 cans of pop

3 cans for 93p

↓ $\frac{£0.93}{3}$

£1 buys 3.23 cans of pop

Cost per pound

Shop A is still shown as being the best value but pay attention to the unit you are calculating, per item or per pound

Best value is the most product for the lowest price per unit

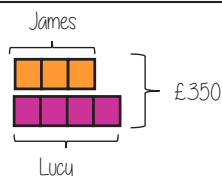
Sharing a whole into a given ratio

R

James and Lucy share £350 in the ratio 3:4. Work out how much each person earns

Model the Question

James: Lucy
3 : 4



£350 ÷ 7 = £50

□ = one part = £50

Find the value of one part

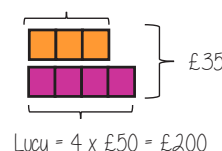
Whole: £350
7 parts to share between (3 James, 4 Lucy)

Put back into the question

James: Lucy

$\left(\begin{matrix} \times 50 & 3 & : & 4 & \times 50 \\ \hline \pounds 150 & : & \pounds 200 \end{matrix} \right)$

James = 3 x £50 = £150



Lucy = 4 x £50 = £200

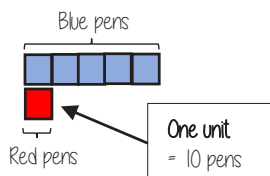
Finding a value given 1:n (or n:1)

R

Inside a box are blue and red pens in the ratio 5:1. If there are 10 red pens how many blue pens are there?

Model the Question

Blue : Red
5 : 1



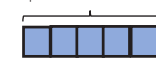
□ = one part = 10 pens

Put back into the question

Blue: Red

$\left(\begin{matrix} \times 10 & 5 & : & 1 & \times 10 \\ \hline 50 & : & 10 \end{matrix} \right)$

Blue pens = 5 x 10 = 50 pens



Red pens = 1 x 10 = 10 pens

There are 50 Blue Pens

YEAR 8 - REASONING WITH DATA...

The data handling cycle

What do I need to be able to do?

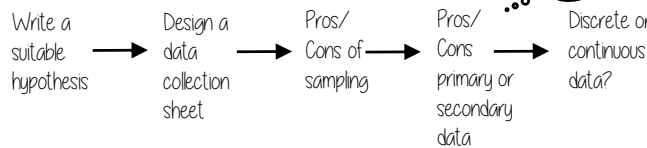
By the end of this unit you should be able to:

- 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

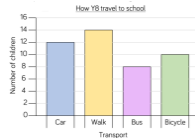
Pictogram

Language	Number of people
French	4
Spanish	4
German	1

● - 4 people

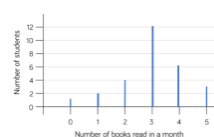
- Need to remember a key
- Visually able to identify mode

Bar Chart



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

Line Chart



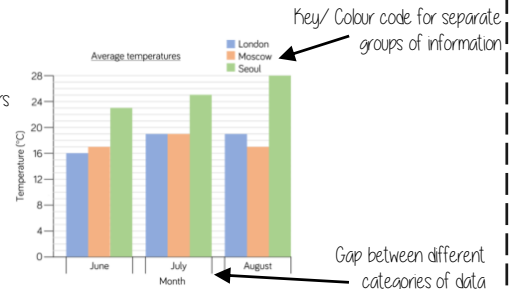
- Gaps between the lines
- Clearly labeled axes
- Scale for the axes
- Discrete Data

Represents quantitative data

Multiple Bar chart

Compares multiple groups of data

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

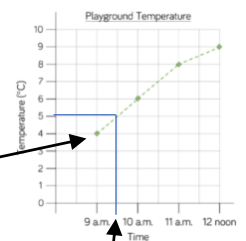


Draw and interpret line graphs

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

Line graphs do not need to start from 0

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



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

Draw and interpret Pie Charts

Remember a circle has 360°

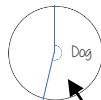
Type of pet	Dog	Cat	Hamster
Frequency	32	25	3

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

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

This fraction of the 360 degrees represents dogs

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



Use a protractor to draw This is 192°

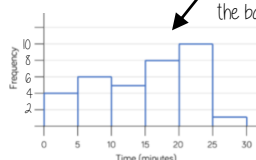
Multiple method

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

Represents quantitative, discrete data

Grouped quantitative data

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



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

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

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

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

Find and interpret the range

The range is a measure of spread

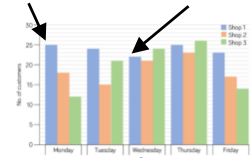
A smaller range means there is less variation in the results - it is more consistent data

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

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

Difference between the biggest and smallest values

Shop 1 highest value Shop 1 lowest value



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

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

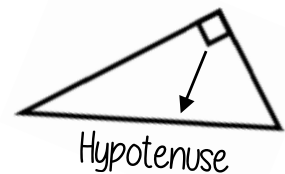
$\sqrt{\quad}$ is the square root symbol

e.g. $\sqrt{64} = 8$
Because $8 \times 8 = 64$

1 × 1	2 × 2	3 × 3	4 × 4	5 × 5	6 × 6	7 × 7	8 × 8	9 × 9	10 × 10
1	4	9	16	25	36	49	64	81	100

Square numbers

Identify the hypotenuse



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

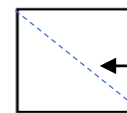
Determine if a triangle is right-angled

If a triangle is right-angled, the sum of the squares of the shorter sides will equal the square of the hypotenuse.

$a^2 + b^2 = \text{hypotenuse}^2$

e.g. $a^2 + b^2 = \text{hypotenuse}^2$
 $3^2 + 4^2 = 5^2$
 $9 + 16 = 25$

Substituting the numbers into the theorem shows that this is a right-angled triangle



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

Calculate the hypotenuse

Either of the short sides can be labelled a or b

$$a^2 + b^2 = \text{hypotenuse}^2$$

1 Substitute in the values for a and b

$$3^2 + 6^2 = \text{hypotenuse}^2$$

$$9 + 36 = \text{hypotenuse}^2$$

$$45 = \text{hypotenuse}^2$$

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

$$\sqrt{45} = \text{hypotenuse}$$

$$6.71\text{cm} = \text{hypotenuse}$$

Calculate missing sides

Either of the short sides can be labelled a or b

$$a^2 + b^2 = \text{hypotenuse}^2$$

$$12^2 + b^2 = 15^2$$

1 Substitute in the values you are given

$$144 + b^2 = 225$$

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

Square root to find the length of the side

$$b^2 = 111$$

$$b = \sqrt{111} = 10.54\text{ cm}$$

Pythagoras' theorem on a coordinate axis

Find the length of the line segment

The segment can be made into a right-angled triangle by adding the sides on the diagram

The line segment is the hypotenuse

$$a^2 + b^2 = \text{hypotenuse}^2$$

The lengths of a and b are the sides of the triangle.

Be careful to check the scale on the axes

Grammar

G1 infinitive verbs

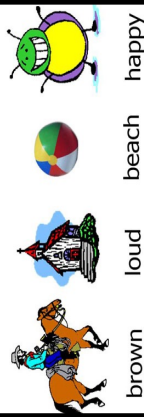
Regular verbs (follow patterns)

- Écouter to listen
- Regarder to watch
- Bavarder to chat
- Visiter to visit
- Étudier to study
- Manger to eat
- Commencer to start
- Finir to finish
- Retrouver to meet
- Trainer to hang out

Irregular verbs (break pattern rules)

- Aller to go
- Faire to do
- Avoir to have
- Être to be
- Lire to read
- Voir to see

An adjective modifies a noun.



G2: Articles and genders

Masc	Fem	Plural	meaning
Le	La	Les	The
Un	Une	X	A
Du	De la	des	some

G3: Adjectives

Masc	MPlural	Fem	FPlural	Meaning
bavard	bavards	bavarde	bavarde	chatty
sympa	sympa	sympa	sympa	Nice
créatif	créatifs	créative	créatives	Creative
ennuyeux	ennuyeux	ennuyeuse	ennuyeuses	Boring
gentil	gentils	gentille	gentille	Kind
ancien	anciens	ancienne	anciennes	old

Pronunciation.

P1. Pronunciation (you see/say)

see	say	see	say
au	"oh"	ch	"sh"
eau	"oh"	é	"ay"
ou	"oo"	an	"ahn"
		un	"uh"
		ille	"eey"
		eu	"eurgh"

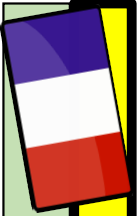
Vocabulary.

V1: Connectives
 et and
 mais but
 parce que because
 cependant however



V2 Intensifiers
 Vraiment truly/really
 Vachement really
 Absolument absolutely
 Complètement completely
 Totalement totally
 Tellement so/rather
 Très very
 Assez quite
 Un peu a bit





Grammar

G1 infinitive verbs

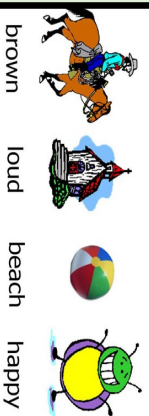
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- Faire to do
- Avoir to have
- Être to be
- Lire to read
- Voir to see

An adjective modifies a noun.



G2: Articles and genders

Masc	Fem	Plural	meaning
Le	La	Les	The
Un	Une	X	A
Du	De la	des	some

G3: Adjectives

Masc	MPlural	Fem	FPlural	Meaning
bavard	bavards	bavarde	bavarde	chatty
sympa	sympa	sympa	sympa	Nice
créatif	créatifs	créative	créatives	Creative
ennuyé ux	ennuyé ux	ennuyée se	ennuyées es	Boring
gentil	gentils	gentille	gentille	Kind
ancien	anciens	ancienne	anciennes	old

Pronunciation.

P1. Pronunciation (you see/say)

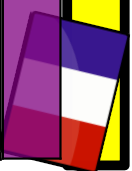
French	French	French	French	French	French
au	"oh"	ch	"sh"	un	"uh"
eau	"oh"	é	"ay"	ille	"ey"
ou	"oo"	an	"ahn"	eu	"eurgh"

Vocabulary.

V1: Connectives
 et and
 mais but
 parce que
 cependant
 car because
 ou or
 because
 however



V2 Intensifiers
 Vraiment truly/really
 Vachement really
 Absolument absolutely
 Complètement completely
 Totalement totally
 Tellement so/rather
 Très very
 Assez quite
 Un peu a bit



Y9 French KO2: The essentials: Tenses: The perfect, near future and conditional tenses



Grammar

Vocabulary

Pronunciation

V1. Future tense adverbs of time

Demain	Tomorrow
Le weekend prochain	Next weekend
La semaine prochaine	Next weekend

G1: The near future tense

Describes an action that **is going to happen in the near future**

Take a bit of aller	Add an infinitive
Je vais	Jouer (to play)
Tu vas	Visiter (to visit)
Il/elle/on va	Bavarder (to chat)
Nous allons	Regarder (to watch)
Vous allez	Écouter (to listen)
Il/elles vont	Manger (to eat)
	Faire (to do/make)
	Lire (to read)
	Voir (to see)
	Boire (to drink)
	Aller (to go)
	Sortir (to go out)

Example sentence

Demain **je vais regarder** un film.
Tomorrow I am going to watch a film.

V2. Past tense adverbs of time

Hier	Yesterday
Le weekend dernier	Last weekend
La semaine dernière	Last week

G2: The perfect tense

Describes an action that is **finished or completed**.

Take a bit of avoir	Add a past participle
J'ai	joué (played)
Tu as	visité (visited)
Il/elle/on a	bavardé (chatted)
Nous avons	regardé (watched)
Vous avez	écouté (listened)
Il/elles ont	mangé (ate)
	fait (did/made)
	lu (read)
	vu (saw)
	bu (drank)

Example sentence

Hier **j'ai mangé** du poulet et des frites.
Yesterday I ate chicken and chips.

Pronunciation P1	
ch	"sh"
è	"air"
é	"ay"
Silent final s,t, x	Nothing

P1. Help with pronunciation	
You see	You say
Je vais	Juh vay
semaine	suhmen
hier	Eeyair
demain	duhma
Vous avez	Voozavay

Y9 French KO3: Que fais-tu pendant ton temps libre? (What do you do in your free time?)

Grammar



Grammar G1: key verbs		
Infinitive form	Present tense	Future Tense
jouer sur ma playstation	Je joue sur ma playstation	Je vais jouer sur ma playstation
retrouver mes amis	Je retrouve mes amis	Je vais retrouver mes amis
faire les magasins	Je fais les magasins	Je vais faire les magasins
regarder un film	Je regarde un film	Je vais regarder un film

Grammar G2		
Jouer & faire with prepositions		
Jouer + au + ball sport		Faire du + sport
Jouer au rugby		Faire du canoe-kayak
Jouer + à la + ball sport		Faire de la + sport
Jouer à la pétanque		Faire de la natation
Jouer + aux		Faire de l' + sport
Jouer aux boules		Faire de l'équitation
		Faire des + sport
		Faire des randonnées

P1:			
You see	You say "oh"	You see	You say "eey"
au		ille	

V1 Weather			
	Il y a du soleil		Il fait du vent
	Il y a des nuages		Il neige
	Il y a des orages		Il pleut
	Il fait chaud		
	Il fait froid		Il y a du brouillard

V2 Adverbs of frequency	
Tous les jours	every day
Toujours	always
Souvent	often
Quelquefois	sometimes
De temps en temps	from time to time
D'habitude	usually
Rarement	rarely

V3: adjectives			
Rigolo	Passionnant	Génial	Ennuyeux
<i>funny</i>	<i>exciting</i>	<i>great</i>	<i>boring</i>
			Nul
			<i>rubbish</i>

Pronunciation



G2 Places (at the / in/ on/ at the house of)	
Au parc Au Macdo = at macdonalds Au collège	A la cantine
En ville = in town	Aux magasins = at the shops
Dans Dans ma chambre = in my bedroom Dans un café	Chez Chez moi = at my house Chez mes grands-parents

V4 Times of day
Le matin = in the morning L'après-midi = in the afternoon Après collège = after school Le soir = in the evening Pendant las semaine = during the week Au weekend = at the weekend

V5 Opinions	
J'aime beaucoup (+ infinitive)	I really like
J'aime assez (+ infinitive)	I quite like
Je le/la/ trouve (+ adjective)	I find it

Y9 French KO4: Qu'est-ce que tu fais au collège? (what do you do at school?)



Grammar

V1: school subjects

Les matières	School subjects
L'anglais	English
La cuisine	Food tech
L'allemande	German
La technologie	DT
L'informatique	ICT
Les sciences	science
Le français	French
Le dessin	art
Les arts plastiques	art
L'emploi du temps	timetable
La récréation	breaktime

La musique *music*
 La pause déjeuner *lunchtime*
 Les maths *maths*
 Le théâtre *drama*
 L'EPS *PE*



Vocabulary

V4: opinions

Je pense que 
 Je trouve que 
 A mon avis
 Je le/la/les trouve...
 Ma matière préférée

I think that
 I find that
 In my opinion
 I find it/them
 My favourite subject

G3: Key verbs infinitive

étudier *to study*
 Commencer *to start*
 finir *to finish*

V3: telling the time



Mon horloge française

Il est heures.

*go to the next hour to subtract (moins)
 *moins le quart
 *moins dix
 *moins cinq
 *moins vingt
 *moins vingt-cinq

V2: numbers	
10	Dix
20	Vingt
30	Trente
40	Quarante
50	cinquante

Pronunciation

Pronunciation P1	
	
eau	"oh"
è	"air"
ou	"oo"
Silent final s,t, x	Nothing

G1: On verbs "on..." "we..."

Verb in "on" form

On rigole
 On bavarde
 On étudie
 On mange
 On a
 On n'a pas de

A la récré
 A la bibliothèque
 Neuf matières
 A la cantine
 Beaucoup de devoirs
 Cours le weekend

G2: Adjectives

Génial	great	Barbant	boring
Marrant	funny	Sévère	strict
Sympa	nice	Agaçant (e)	annoying
Utile	useful	Difficile	difficult
Facile	easy	Raisnable	reasonable
Passionnant	exciting	Injuste	unfair
Pratique	practical		

Y9 French KO 5: Qu'est-ce que tu aimes manger? (what do you like to eat?)



Grammar

G1: Verb tenses	
Present tense	Past perfect tense
Je mange / <i>eat</i>	J'ai mangé / <i>ate</i>
Je goute / <i>taste</i>	J'ai goûté / <i>tasted</i>
Je prends / <i>take</i>	J'ai pris / <i>took</i>
Je bois / <i>drink</i>	J'ai bu / <i>drank</i>

G2: Partitive article

When listing food and drink in French you must always put the word 'some' in front of each item. The word 'some' depends on whether the item is **masculine**, **feminine** or **plural**.

Masculine	le pain	du pain
Feminine	la confiture	de la confiture
Plural	les céréales	des céréales
Vowel / h	l'eau	de l'eau

manger + de boire + de
 Je mange du pain avec du beurre et de la confiture.
 Je bois de l'eau et du jus d'orange.

Pronunciation

G3: Imperfect tense	G3 Comparative adjectives	Pronunciation P1	
"it was..."	Plus...que Moins...que Aussi ...que Meilleur(e) que Pire que		
C' était <i>it was</i> Ce n'était pas <i>it wasn't</i>		eu	"eurgh"
		un	"uh"
		ou	"oo"
		Silent final s, t, x	Nothing

Vocabulary.

V1: Food	V2: Adjectives	
Un sandwich au fromage a cheese un sandwich, les crudités le poisson, les frites le steak haché, les haricots La pizza, Le yaourt La mousse au chocolat La glace a la fraise Le pain	animé(e) agréable divertissant(e) <i>entertaining</i> tranquille passionnant(e) pittoresque <i>picturesque</i>	beau (belle) bryant(e) désagréable déprimant(e) affreux (euse) laid(e) ancien(ne)
	lively pleasant <i>exciting</i> peaceful	beautiful noisy unpleasant depressing awful ugly old

V3: adverbs of time and frequency

Une fois par semaine	once a week	Pour le petit déj
Une fois par mois	once a month	Pour le déjeuner
Rarement	rarely	Pour le dîner
Souvent	often	Pour dessert
Quelqufois	sometimes	Hier

V4 locations

A la cantine *at the cantine*
 Chez moi *at mine/my house*
 Au Macdo *at macdonalds*
 Au restaurant

KO1. German Essentials.

Grammar.

G1. Essential Verbs. (present tense)			
Pronoun	haben = to have	sein = to be	werden = to become
ich (I)	habe (I have)	bin (I am)	werde (I become)
du (you) informal)	hast (you have)	bist (you are)	wirst (you become)
er/sie/es (he/she/it)	hat (he/she/it has)	ist (he/she/it is)	wird (he/she/it becomes)
wir (we)	haben (we have)	sind (we are)	werden (we become)
ihr (you plural)	habt (you have)	seid (you are)	werdet (you become)
Sie/sie (you polite/they)	haben (you polite/they have)	sind (you polite/they are)	werden (you polite/they become)

G2. Definite & Indefinite Articles & Genders.		
Gender	the	a
masculine	der	ein(en)
feminine	die	eine
neuter	das	ein
plural	die	viele (a lot)

Vocabulary.

V1. Vocabulary Essentials.		
Intensifiers	Connectives	
besonders (especially)	aber (but)	
ein bisschen (a bit)	auch (also)	
sehr (very)	denn (because)	
wirklich (really)	deshalb (therefore)	
ziemlich (quite)	jedoch (however)	
zu (too)	und (and)	
Subordinating Conjunctions (Verb Kickers)		
da (because)	dass (that)	
obwohl (although)	weil (because)	
wenn (if/when)	wo (where)	

V2. Numbers.				
0 = null	1 = eins	2 = zwei	3 = drei	4 = vier
5 = fünf	6 = sechs	7 = sieben	8 = acht	9 = neun
10 = zehn	11 = elf	12 = zwölf	13 = dreizehn	14 = vierzehn
15 = fünfzehn	16 = sechzehn	17 = siebzehn	18 = achtzehn	19 = neunzehn
20 = zwanzig	30 = dreißig	40 = vierzig	50 = fünfzig	60 = sechzig
70 = siebenzig	80 = achtzig	90 = neunzig	100 = hundert	1000 = tausend

Pronunciation.

P1. Das Alphabet.				
A = ah	B = bay	C = tsay	D = day	
E = ey	F = eff	G = gay	H = hah	
I = ee	J = yot	K = car	L = ell	
M = emm	N = enn	O = oh	P = pay	
Q = kuh	R = air	S = ess	T = tay	
U = ooh	V = fow	W = vay	X = eeks	
Y = oopsi- lon	Z = tsett			

P2. Commonly Mispronounced German Words.			
habe (harbour)	viele (feeler)	weil (vile)	meine (miner)
Schule (shooler)	neunzehn (n-o-in say-n)	Deutsch (doi-t-sh)	Englisch (eng-lish)
Mädchen (maid-tshun)	Schildkröte (sh-ild-kr-u-te)	Brüder (broo-der)	heiße (hi-sur)

KO1.1 German Essentials 2.

Grammar

G1. Possessive Pronouns

Gender	my	his	her
masculine	mein	sein	ihr
feminine	meine	seine	ihre
neuter	mein	sein	ihr
plural	meine	seine	ihre

Vocabulary.

V1. Colours

blau	blue	braun	brown
grau	grey	grün	green
lila	purple	rot	red
schwarz	black	weiß	white

V2. Common Questions Words

Was	What	Wer	Who
Wie	How	Wo	Where
Wann	When	Welche	Which

Vocabulary.

V3. Key Phrases. Greetings & Introductions.

Deutsch	English
Guten Tag/Hallo	Hello
Wie geht's?	How are you?
Mir geht's gut und dir?	I'm good, and you?
Wie heißen Sie/ Wie heißt du?	What is your name? (formal/informal)
Ich heiße/Mein Name ist/ich bin	I'm called/My name is/I am
Auf Wiedersehen/Tschuss	Goodbye/bye
Bitte	Please
Dankeschön/Danke	Thank you/thanks.
Wie alt sind Sie/ Wie alt bist du?	How old are you? (formal/informal)
Woher kommen Sie/Woher kommst du?	Where do you come from? (formal/informal)

Pronunciation.

P1. Key Sounds

you see 	you say 	example
ei	eye	eins (eye-ns)
ie	ee	sieben (see-bun)
au	ow!	blau (bl-ow)
eu/äu	oi	neun (noin)
w	v	wie (v-ee)
j	y	Ja! (ya!)
sch	sh	Schuh (shoe)
__e	uh	habe (har-buh)
ä	ey/e	Bär (bear)
ö	urr	schön (sh-urn)
ü	ooh	grün (g-ooh-n)
ß	ss	weiß (v-eye-ss)

K02. Was machst du in deiner Freizeit? (What do you do in your free time?) Part 1



Grammar.

G1. Essential Verbs. (present tense)

Pronoun	spielen = to play	machen = to make/do
ich (I)	spiele (I play)	mache (I make/do)
du (you) informal)	spielst (you play)	machst (you do/make)
er/sie/es (he/she/it)	spielt (he/she/it plays)	macht (he/she/it makes/does)
wir (we)	spielen (we play)	machen (we make/do)
ihr (you plural)	spielt (you play)	macht (you make/do)
Sie/sie (you polite/they)	spielen (you polite/they play)	machen (you polite/they make/do)

Pronunciation (you see, you say)

P1. You see, you say.

ß	"ss"	ü	"uuu"	au	"ow"
ä	"ay"	ei	"i"	sch	"sh"
ö	"euh"	ie	"ee"	w	"v"

G2: How to form regular verbs!

You remove the **en** from the infinitive of the verb. Then **add the endings** below. A handy **mnemonic** is given to help you remember!
e.g. **gehen** = **to go** Use **geh** + add endings.

Every
STric
Teacher
ENds
The
ENjoyment!

Ich gehe
Du geh**st**
Er geht
Wir geh**en**
Ihr geht
Sie/sie geh**en**

Other regular verbs:

hören = **to listen**
singen = **to sing**
malen = **to paint**
kochen = **to cook**

V1. Common Sports/Activities

Deutsch	Englisch
Fußball	<i>football</i>
Federball	<i>badminton</i>
Tischtennis	<i>table tennis</i>
Fernsehen	<i>television</i>
Lesen	<i>reading</i>
Radfahren	<i>cycling</i>
Einkaufen	<i>shopping</i>
Hausaufgaben	<i>homework</i>
in den Park	<i>to the park</i>
in die Stadt	<i>into town</i>
ins Kino	<i>to the cinema</i>

V2: Opinion adverbs

sehr gern
gern
ziemlich gern
nicht gern
gar nicht gern

very gladly
gladly
quite gladly
not gladly
not gladly at all

KO2. Was machst du in deiner Freizeit? (What do you do in your free time?) Part 2



Grammar.

G1. Irregular Verbs. (present tense)

Pronoun	sehen = to watch	lesen = to read	fahren = to go (by vehicle!)	essen = to eat	finden = to find
ich (I)	sehe (I watch)	lese (I read)	fahre (I go)	esse (I eat)	finde (I find)
du (you) (informal)	siehst (you watch)	liest (you read)	fährst (you go)	isst (you eat)	findest (you find)
er/sie/es (he/she/it)	sieht (he/she/it watches)	liest (he/she/it reads)	fährt (he/she/it goes)	isst (he/she/it eats)	findet (he/she/it finds)
wir (we)	sehen (we watch)	lesen (we read)	fahren (we go)	essen (we eat)	finden (we find)
ihr (you plural)	seht (you watch)	lest (you read)	fahrt (you go)	esst (you eat)	findet (you find)
Sie/sie (you polite/they)	sehen (you polite/they watch)	lesen (you polite/they read)	fahren (you polite/they go)	essen (you polite/they eat)	finden (you polite/they find)

G2: Irregular verbs

Du & er/sie/es forms do not follow the regular pattern. (see differences in **red**.) Other forms **mostly** follow the regular pattern. (Note: there are some exceptions).

G3: Word order

Adverbs of frequency follow the verb!
 ZB: Ich spiele oft Fußball.
 Wir gehen immer in die Stadt

Vocabulary.



V1. Adjectives

irre	amazing
toll	great
unterhaltsam	entertaining
nicht schlecht	not bad
furchtbar	awful
ermügend	tiring
schwierig	difficult

V2. Adverbs of frequency

häufig	frequently
jeden Tag	every day
ab und zu	now & then
regelmäßig	regularly
einmal pro Woche	once a week
einmal pro Monat	once a month
zweimal pro Woche	twice a week
zweimal pro Monat	twice a month
oft	often
immer	always
selten	rarely
nie	never

K03. Was machst du am Computer oder auf deinem Handy? (What do you do on a computer or on your phone?)



Grammar.

Vocabulary.

G1. Regular & Irregular Verbs. (present tense)						
Pronoun	simsen = to text	suchen = to look for/search	telefonieren = to call/phone	chatten = to chat	herunterladen = to download	
ich (I)	simse (I text)	suche (I look for)	telefoniere (I call/phone)	chatte (I chat)	lade herunter (I download)	
du (you informal)	simst (you text)	suchst (you look for)	telefonierst (you call/phone)	chattest (you chat)	lädst herunter (you download)	
er/sie/es (he/she/it)	simt (he/she/it texts)	sucht (he/she/it looks for)	telefoniert (he/she/it calls/phones)	chattet (he/she/ it chats)	lädt herunter (he/she/it downloads)	
wir (we)	simsen (we text)	suchen (we look for)	telefonieren (we call/phone)	chatten (we chat)	laden herunter (we download)	
ihr (you plural)	simt (you text)	sucht (you look for)	telefoniert (you call/phone)	chattet (you chat)	ladet herunter (you download)	
Sie/sie (you polite/they)	simsen (you polite/they text)	suchen (you polite/they look for)	telefonieren (you polite/they call/phone)	chatten (you polite/th ey chat)	laden herunter (you polite/they download)	

G2: Word order

Adverbs / time phrases can also go at the start of the sentence.

Remember **verb** must be the **second idea!**

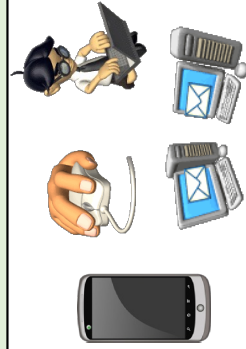
zB: Jeden Abend **simse** ich mit Freunden.

G3: Separable verbs

The **prefix** of a separable verb goes to the end of the sentence.

herunterladen

zB: Auf meinem Handy lade ich Musik **herunter**.



V1: Time Markers

Deutsch	Englisch
am Abend	<i>In the evening</i>
jeden Tag	<i>every day</i>
am Wochenende	<i>at the weekend</i>
jeden Morgen	<i>every morning</i>
jeden Monat	<i>every month</i>
jede Woche	<i>every week</i>

V1: Noun phrases

Deutsch	Englisch
am Computer	<i>on the computer</i>
auf meinem Handy	<i>on my phone</i>
mit meiner Familie	<i>with my family</i>
mit Freunden	<i>with friends</i>
Infos für die Hausaufgaben	<i>Information for my homework</i>
Fotos oder Filme	<i>photos or videos</i>
auf What's App	<i>on What's App</i>
auf Snapchat	<i>on Snapchat</i>

KO4. Was wirst du am Computer oder auf deinem Handy morgen machen? (What will you do on the computer/on your phone tomorrow?)



Grammar.

G1. Forms of <u>Werden</u>		G2: Future tense
ich (I)	werde <i>will</i>	Proper future tense in German is formed by using a form of werden with the infinitive of the verb! ZB: Ich werde Videos sehen . You can also include a time marker in your sentence. It can either go after the verb ZB: Ich werde nächste Woche mit Freunden auf Snapchat chatten . or it can go at the start of the sentence. Remember the rule of the verb being the second idea! ZB: Heute Abend wird mein Bruder mit Freunden simsen .
du (you) <i>informal</i>	wirst <i>will</i>	
er/sie/es (he/she/it)	wird <i>will</i>	
wir (we)	werden <i>will</i>	
ihr (you plural)	werdet <i>will</i>	
Sie/sie (you polite/they)	werden <i>will</i>	

G3: Near future tense

You can also give a future intention in German by using a future tense **time marker** with the **present tense**!

The **time marker** can either follow the verb or be used at the start of the sentence.

ZB: Ich **spiele heute Abend** Computerspiele.
 ZB: **In zwei Wochen** **suche** ich Infos für die Hausaufgaben.



Vocabulary.



V1: Time Markers

Deutsch	Englisch
heute	<i>today</i>
Heute Abend	<i>this evening</i>
Morgen	<i>tomorrow</i>
Übermorgen	<i>day after tomorrow</i>
Nächste Woche	<i>Next week</i>
In zwei Wochen	<i>In 2 weeks</i>

V1: infinitives

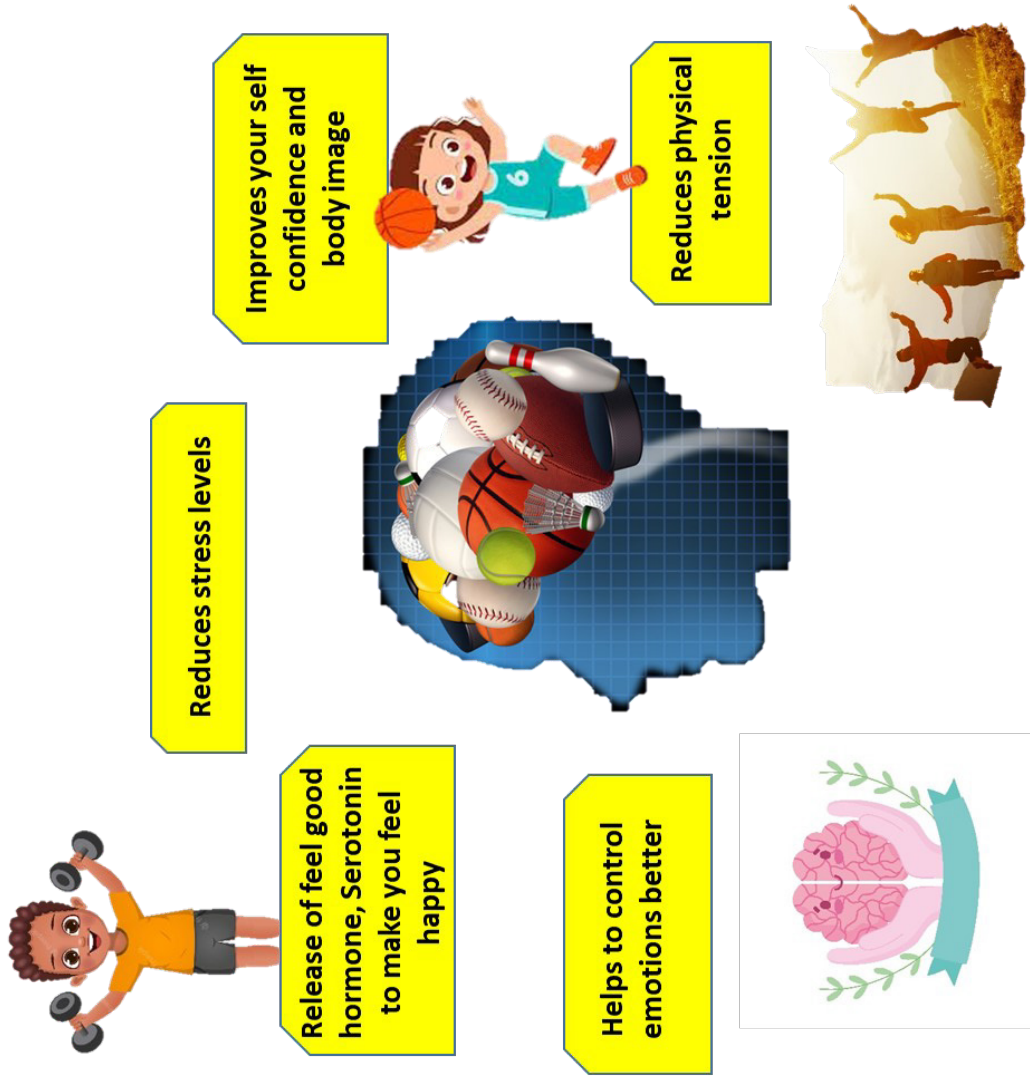
Deutsch	Englisch
spielen	<i>to play</i>
machen	<i>to do / make</i>
simsen	<i>to text</i>
suchen	<i>to look for / search</i>
telefonieren	<i>to call / phone</i>
chatten	<i>to chat</i>
sehen	<i>to see / watch</i>
herunterladen	<i>to download</i>

Year 8 Physical Education

1. Fitness Components and their tests

Component of Fitness	Definition	Sporting Examples
Agility	The ability to move and change direction quickly, at speed, while maintaining control	Football – Dribbling Basketball – Dribbling
Balance	Maintaining the centre of the mass over the base of support	Gymnastics – Headstand
Cardiovascular Endurance	The ability of the heart and lungs to supply oxygen to the working muscles	Marathon Running Long Distance Cycling
Coordination	The ability to use two or more different parts of the body together, smoothly and efficiently	Cricket – bowling Tennis - Serve
Flexibility	The range of movement possible at a joint	Gymnastics – Splits Badminton – Lunge
Muscular Endurance	The ability of a muscle or a muscle group to undergo repeated contractions, avoiding fatigue	Long distance cycling Fitness - plank
Power	The product of speed and strength. $\text{Power} = \text{strength} \times \text{speed}$	Athletics – Shot Put
Reaction Time	The time taken to initiate a response to a stimulus	Tennis – return of serve Cricket – Catching
Strength	The ability to overcome resistance.	
Speed	The maximum rate at which an individual is able to perform a movement or cover a distance in a period of time.	Athletics – 100m Sprint

2. Sports and Physical Activity improves your mental Health

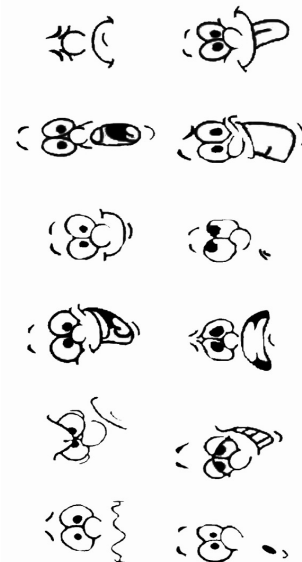


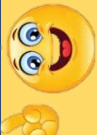





Year 8 Drama

Autumn Term 1:

Command words:



<p>1</p> <p>Vocal skills</p> <p>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 thinking or how they are feeling</p>	<p>2</p> <p>Physical skills</p> <p>Facial expression: showing emotion of the character through the face Body Language: using your body to show the characters 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</p>	<p>4</p> <p>Theatrical skills</p> <p>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</p>
	<p>IDENTIFY</p>	<p>Can you find where in the performance they have used a particular skill?</p>
<p>3</p> 	<p>ANALYSE</p>	<p>Why have they used this technique / skill, what was the effect?</p>
 	<p>EVALUATE</p>	<p>Were they successful when using this techniques / skill? If so why? If not why not?</p>

Autumn Term 2:

1. How to Evaluate in Drama

Evaluating OUR OWN PERFORMANCE AND THE PERFORMANCES OF OTHERS	
<p>1. Introduction: Your performance: describe in detail the performance and the character you played Someone else's: as an audience member what did the performance make you think about? Select one character and write in detail about them</p>	<p>Your performance: What theatrical skills did you use, why did you use these? What was the effect you were hoping to have on the audience? Someone else's: What did you learn about the characters and the story from their performance. What do you think the aim was? Was it funny? Sad? Compelling? Unpick the theatrical skills one performer used and think why? What was the purpose? What affect did it have on you?</p>
<p>2. Your performance: Do you think you were able to create a successful performance, meeting your aims and intention? Someone else's: Do you think they were able to create a successful performance?</p>	<p>Your performance and someone else's: If you / they were successful why? If you weren't why not? What could you / they have done differently? What was good about your / there personal performance and how could you / they improve? LINK TO THEATRICAL SKILLS USED THROUGHOUT!</p>
<p>3. Write about the performance as a whole.</p>	<p>What worked well? What didn't? Do you have any ideas about how you / they might have altered/changed the performance if given more time?</p>



Year 8 Drama

2. How to Analyse in Drama

Analyse OUR OWN PERFORMANCES AND SOMEONE ELSE'S:	
<p>1. Space:</p>	<ul style="list-style-type: none"> - Is there a fourth wall? - How have you / THEY used proxemics to show relationships? What relationship was created? - What is the focus of the audience?
<p>2. Character:</p>	<ul style="list-style-type: none"> - How have you / THEY shown the age of the character? - How have you / THEY shown the personality of the audience? - How has the character helped to create meaning in your / THEIR performance? <p>LINK TO THEATRICAL SKILLS THROUGHOUT</p>
<p>3. Analysis of the moment: Explain in detail the meaning created by the moment, relating to the audience. E.g. how it made the audience understand the character, themes or story, how it created empathy, comedy, tension or communicated a message for the audience etc. Your personal— how did you: think/feel/react/respond/engage? What meaning was communicated to you at this point.</p>	



Year 8 Drama

Spring Term 1:

1

Macbeth (Texts in Practice)

Context of the play:

- Social, historical and cultural context: Macbeth is a play about an ancient Scottish king who turns to evil in the pursuit of power. He accepts that he must commit murder if he is to seize the throne. The real historical figure was not nearly as bad but Shakespeare was trying to win favour for his theatre company by pleasing the new king, James I.

LIGHTING:

- **Focus:** area of stage (US/DS/SC/SL/SR), on a character/location/set.
- **Intensity:** blackout, dim, harsh, bright, full intensity, medium intensity.
- **Colour:** coloured gels, warm, cold (steel)
- **Mood/atmosphere:** sterile, tense, ominous, foreboding, merry, serene, intimacy, claustrophobic...

COSTUME:

- **Garment:** period, colour, fabric/material, texture, layers, cuts, neckline, length
- **Appearance:** shape, fit, condition/distress, rips/tears/stains

SOUND:

- **Live sound:** actor voice, on-stage action, live instruments, vocals.
- **Recorded sound:** music, sound effects, soundscape
- **Music:** style, atmosphere, effect, bass, treble, tempo
- **Effects:** echo, distortion, volume, amplification, pitch, reverb, fade, crossfade.
- **Microphones:** radio mics, microphones/stands, hanging mics.

SET:

- **Positioning:** scale, perspective, sightlines, levels, entrances/exits, location (SL/SR/CS/US/DS), relationship, to stage space (proscenium, in the round, traverse, thrust, promenade, end-on)
- **Furniture:** style, period, material
- **Effect:** location, proxemics, relationship with actors, action, lighting, projection, scene changes concept/style.

2

Macbeth Main Characters

Macbeth	'tomorrow, and tomorrow and tomorrow / Creeps in petty pace from day to day'		
Lady Macbeth	'out, damned spot!'		
Macduff	'o horror, horror, horror! / Tongue nor heart cannot conceive nor name thee'		
Three Witches	'Double, double, toil and trouble; / Fire burn, and cauldron bubble'		
Malcolm	'What I believe, I'll wait; / what know, believe; and what I can redress, / As I shall find the time to friend, I will'		
Banquo	'Merciful powers / Restrain in me the cursed thoughts		

3

Macbeth Minor Characters

Kind Duncan	Donalbain	Lennox	Ross	Fleance
Son of Macduff	Wife of Macduff	Porter	Hecat	Murderers
Apparitions	Servants	Lords	Messengers	Soldiers
Menteth	Cathness	Seyward	Young Seyward	A Captain
Seyton	English Doctor	Scottish Doctor	Gentlewoman	Three other Witches

4

DESIGN ELEMENTS:



Year 8 Drama

Spring Term 2:

1

LIGHTING:

- **Fresnel** = soft edged light, with a diffused lens. Its useful for good overall light. Coloured gels can be added
- **Spotlight** = fixed light with a hard edge effect, used to light characters or set pieces. Can create a restricted space. Gels can be used.
- **Follow Spot** = same as a spot light but can follow the movement around the stage
- **Flood light** = clear wide-angled light, with little control over its spread. Gels can be added
- **Birdie** = lantern that can be placed on the set or at the front of the stage (not very strong)
- **Gobo** = projects a shape onto the stage in order to create an effect
- **Gel** = a coloured film that can be added to specific lights to change the colour
- **Focus** = where on the stage is being lit up (e.g. center stage)
- **Intensity** = how bright or dim the lights are, high intensity = bright lights

2

SET:

- **Positioning:** scale, perspective, sightlines, levels, entrances/exits, location (SL/SR/CS/US/DS), relationship, to stage space (**Stage Configurations:** proscenium, in the round, traverse, thrust, promenade, end-on)
- **Furniture:** style, period, material, colour
- **Key Terms:**
- **Truck** = A moveable piece of staging that is on wheels.
- **Projection on a cyclorama** = a projected image is shown onto the back of the stage creating a location (this image can be changed during the show)
- **Flats** = can be used to create temporary backdrops for scenes. A flat can be decorated in any way to depict locations.
- **Backdrop** = a painted background used at the back of the stage to create location
- **Revolving stage** = the stage can revolve allowing for quick scene changes or to suggest movement
- **Automation** = this is a piece of furniture that is controlled with a controller and can therefore move around the stage seemingly independently
- **Naturalistic set design** = attempts to create a completely realistic representation of the location – absolute attention to detail.
- **Minimalistic set design** = used symbols to emphasize themes, used props to represent location e.g. bed = bedroom

3

COSTUME:

- **Material** = communicates the context of a performance (the period, the year, the time frame)
- **Fit and Condition** = communicates background information, for example if their clothes is obviously too big and has holes in it, it could be a sign that it is a hand-me-down item given by an older sibling, perhaps suggesting they don't have much money.
- **Colour** = Can foreshadow elements about a character, for example: violent= red, or innocent=white.
- **Link to character** = **Costume** can be used to reveal information about the characters in the play. For example, where the characters come from, their background and the surrounding context. It can also be used to **communicate status** to your audiences showing who has power / money / authority or not.
- **Things to describe:**
- **Hair, makeup,** (are integral to costume design – special effects can be used to age an actor or complete the look.), **shoes, whole outfit, personal props**

4

SOUND:

- **Live sound:** actor voice, on-stage action, live instruments, vocals.
- **Recorded sound:** music, sound effects, soundscape
- **Music:** style, atmosphere, effect, bass, treble, tempo
- **Effects:** echo, distortion, volume, amplification, pitch, reverb, fade, crossfade.
- **Microphones:** radio mics, microphones/stands, hanging mics.
- **Underscore** – Sound and music can be used to underscore a scene, adding tension and atmosphere to a particular moment. For example: A low drone played underneath a scene that foreshadows something bad happening.
- **Ambient Sound** – or 'background' sound. This can be used to help the audience understand the setting or location of a scene. For example, a scene set in a train station might have the sound of a train engine huffing and the conductors whistle blowing.
- **Direction of sound** – Sound can be used to focus the audience's attention. You could use speakers coming from behind the audience to make them feel like they are part of the action. Or you might have the sound coming from off stage to signify something happening in an area that we as the audience can not see.

Roles and responsibilities in the theatre :

1. Theatre Maker: Understudy
What they do: Learning a part, including lines and movements, so they are able to take over a role for someone if needed when there is a planned or unexpected absence.

2. Theatre Maker: Playwright
What they do: Writing the script of the play, including the dialogue and stage direction

3. Theatre Maker: Puppet Designer
What they do: Designing the puppets for a production, taking into account the style of puppets and how they will be operated.

4. Theatre Maker: Costume Designer
What they do: Designing what the actors wear on stage. Making sure that costumes are appropriate for the style and period of the piece. Ensuring the costumes fit the audience.

5. Theatre Maker: Theatre Manager
What they do: Running the theatre building, including overseeing the front of house staff (ushers) and the box office staff who sell tickets.

6. Theatre Maker: Director
What they do: Overseeing the creative aspects of the production. Developing a 'concept' or central unifying idea for the production. Liaising with designers, rehearsing the actors and ensuring that all technical elements of the play are ready. Giving 'notes' to the actors to help improve their performances and agreeing the blocking (or movement) of the actors

7. Theatre Maker: Technician
What they do: Operating the technical equipment, such as the lighting and sound boards, during the performance.

8. Theatre Maker: Performer
What they do: Appearing in a production, for example by acting, dancing or singing. Creating a performance or assuming a role on stage in front of the audience.

9. Theatre Maker: Sound Designer
What they do: Designing the sound required for the performance, which may include music and sound effects. Considering if amplification, such as the use of microphones, is needed, and creating a sound plot.

Year 8 Drama:

10. Theatre Maker: Set Designer
What they do: Designing the set of the play and the set dressing (objects placed on the stage). Providing sketches and other design materials before overseeing the creation of the set.

11. Theatre Maker: Stage Manager
What they do: Running the backstage elements of the play and supervising the backstage crew. Organising the rehearsal schedule and keeping lists of props and other technical needs. Creating a prompt book and calling the cues for the performance.

12. Theatre Maker: Lighting Designer
What they do: Designing the lighting states and effects that will be used in a performance. Understanding the technical capabilities of the theatre and creating a lighting plot.

Stage Configurations:



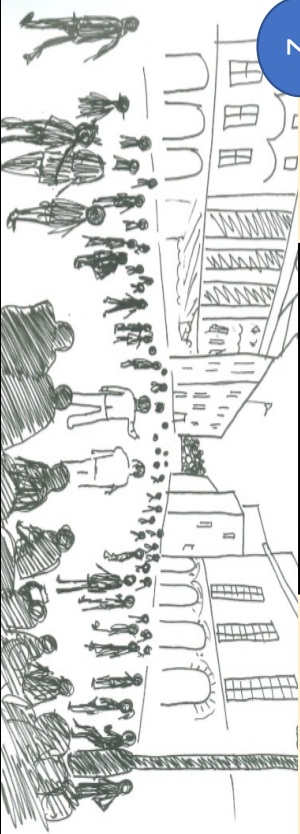
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Traverse



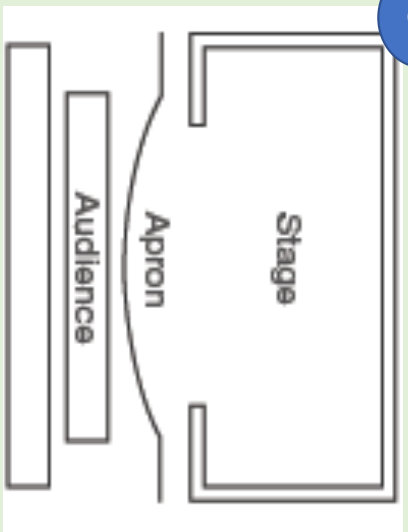
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Promenade Theatre



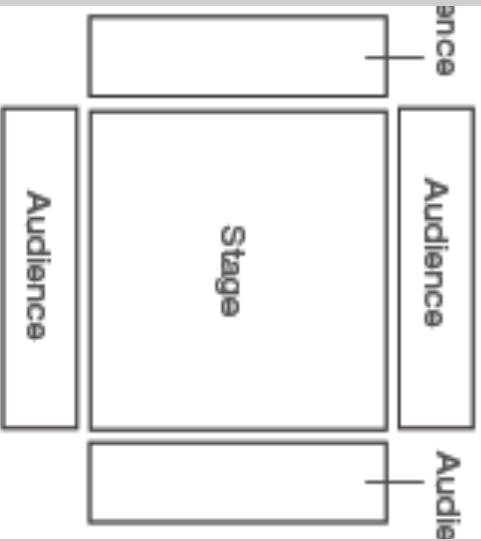
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Proscenium arch



4

Theatre in the Round



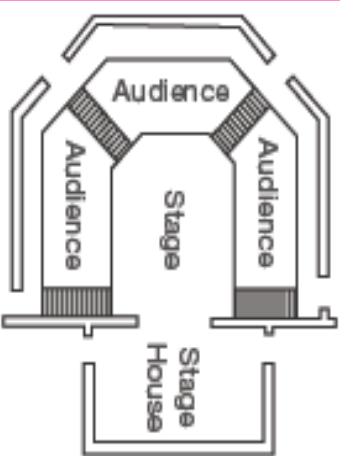
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Stage Positioning:

Up right	Up centre	Up left
Right center	Center	Left center
Down right	Down center	Down left

6

Thrust stage



Practical Workshops

Year 8 Drama:

Summer Term 1:

STYLES OF PERFORMANCE:

1 Naturalism: aims to create the illusion of real life. It should come across as completely believable to the audience

Non-Naturalism: uses a range of dramatic conventions, not seen in the 'real world' (freeze frames, thought tracking etc.). These two styles can be mixed together, having elements of both.

Building a character: 2

Basic: what do they sound like? How do they move? What do they look like? What is their backstory?

Advanced: improvise characters in different scenarios, hotseat characters, find your characters motivations and objectives.

<p>3 Key terms and Definitions</p>	
<p>Devising = the process of creating new and original pieces of drama for performance</p>	
<p>Stimulus = the inspiration for a piece of drama.</p>	
<p>Devising Techniques and Strategies = skills used to explore a stimulus or idea: still image, thought tracking, hot seating, freeze frames etc.</p>	
<p>Narrative = the storyline or plot of a performance. This should be clear for the audience. There are many different ways to structure a narrative. E.g. chronologically or non-chronologically. (in time order, not in time order)</p>	
<p>Topic / Theme = the subject matter or focus of a performance. The stimulus will normally be linked to the topic to create a clear focus.</p>	<p>7 - A narrative monologue: a character telling a story, often in past tense</p>



<p>4 Group Roles: Everybody must take part in the performance, with someone being responsible for a specific area during the creation process (these roles can change from lesson-lesson or activity-activity).</p> <p>Spokesperson: Be ready to EXPLAIN your groups' ideas to the rest of the class, when asked</p> <p>Director: LEAD and SUPPORT the team and make sure everyone is involved</p> <p>Ideas Generator: DEVELOP the ideas that the group share – DEMONSTRATE your use of drama techniques</p> <p>Peer Assessor: EVALUATE your group's work and make decisions on what went well (WWW) and even better if (EBI)</p> <p>Scribe: MAKE notes of the most relevant points discussed by your group during planning</p>	<p>5</p>
<p>Monologue</p> <ul style="list-style-type: none"> • Character who is communication to the audience or with another character • Monologues serve a specific purpose in storytelling—to give the audience more details about a character or about the plot. 	<p>6</p>
<p>Soliloquy</p> <ul style="list-style-type: none"> • A speech a character makes to themselves whilst alone on stage. As if they are thinking out aloud. • Soliloquies are a common tool in William Shakespeare's plays 	<p>8</p>



5 **Vocal skills**

- Pace:** how fast or how slow the character speaks
- Power:** how loud or how quiet a character speaks
- Pitch:** how high our how low a character speaks
- Pause:** moments where the character stops talking
- Tone:** shows what the character thinking or how they are feeling

4 Narrator

1 Stimulus		A starting point, used as inspiration to develop and create your performance.
2 Devising		Creating an original performance, with original characters and a full and complete story.
3 Soundscape		Creating the sounds associated with a given location / atmosphere to more clearly show the setting

The Narrator adds spoken commentary to a performance. A Narrator is like a story teller informing the audience about the plot. Narration is a useful skill for making the story more understandable for the audience.

1. Grab the audience from the start

Don't take too long to get into the main action of the play.

Radio Drama thrives on **strong narratives**. Whether you're writing a tragedy, a comedy or a play to change the world, a great storyline will keep your audience listening. However, don't make the story too complicated with too many themes, characters and plotlines, or the listener will get confused.

2. Vary the pace and length of your scenes

A radio play which has five ten-minute scenes, each set in a dining-room, is likely to be less effective than a play which varies its scenes and settings. Using a variety of backgrounds, scene lengths and sound effects will usually make the story more effective for the listener.

3. Make sure the structure keeps them listening

Think about beginning, middle and end and your play. Think about what will grab the audience's attention and as the play unfolds, why they should keep listening. Then think about how the situation in your play develops and changes through the middle of the play and then how it is resolved. Check that that doesn't feel predictable. Use the element of surprise!

4. Get under the skin of your characters

Get to know them really well. Each will have their own individual speech mannerisms. Don't have them all speaking in your tone of voice.

5. Use the four building blocks - speech, sound effects, music and silence

Attempt to include all four of these building blocks, they can be used together to build a narrative and story that your audience will find interesting.

6. Express the visual elements in a subtle way

Think about how to express visual elements of your play in a subtle way to help the audience imagine the story you are telling. If you have a very visual idea that you want to write about – perhaps a fantastical creature – think how, without visuals, you can make the audience understand who or what is speaking. For example, if a butterfly appears and starts talking – how are the audience going to understand that it's a butterfly? It can work, but you'll need to find a way to establish this clearly.

7. Enjoy writing your play

If you enjoy it, the chances are that other people will too.

Key to a successful performance: Use of voice, A clear location, A clear story line

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*



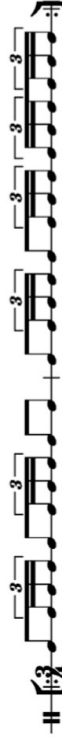
Rhythmic Riff from “We Will Rock You” – *Queen*



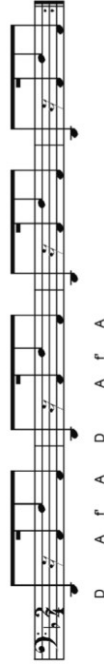
Vocal and Melodic Hook from “We Will Rock You” – *Queen*



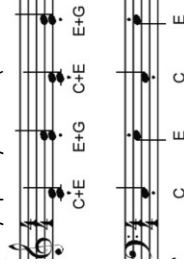
Rhythmic Ostinato from “Bolero” – *Ravel*



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 :



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	1	2	3	4	1	2	3	4
“Offbeat” rhythms (strong beats)	J	?	J	?	J	?	J	?

OFFBEAT RHYTHM GRID

Pulse	1	2	3	4	1	2	3	4
“Offbeat” rhythms (weak beats)	?	J	?	J	?	J	?	J

SYNCOPATION – A way of changing a rhythm by making

Pulse

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: **BASS 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**

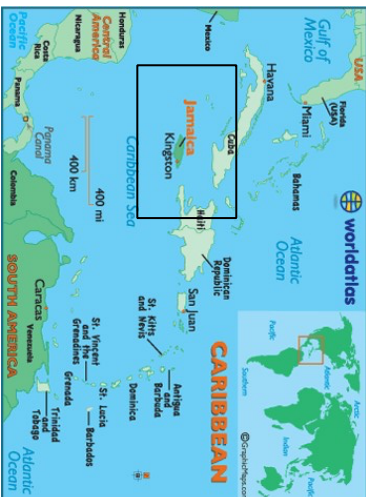
Most Reggae songs are **POPULAR SONG FORM**.

SIMPLE HARMONIES (see F4)



LYRICS (MELODY)
 SYNCOPATED RHYTHMS
 RIFFS
 OFFBEAT CHORDS
 BASS LINE RIFFS

B. Where is Jamaica?



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.

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, ANTI-RACISM, OPTIMISM** and **FREEDOM**.

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.





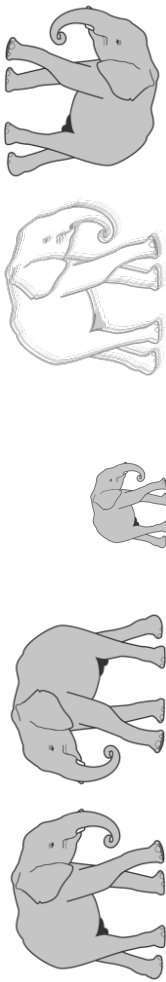
Exploring musical ideas/ways to develop

VARIATIONS

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:**

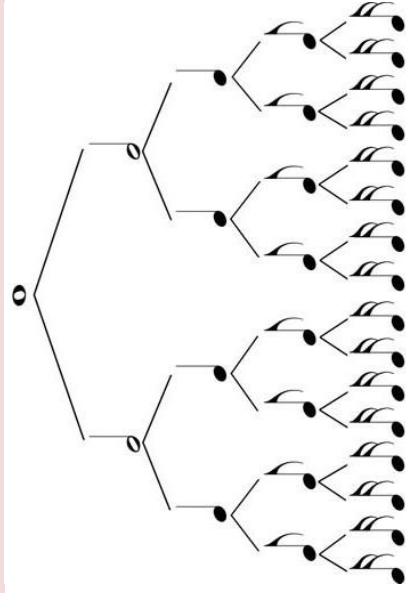


A (Theme) A1 (Variation) A2 (Variation) A3 (Variation) A4 (Variation)

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

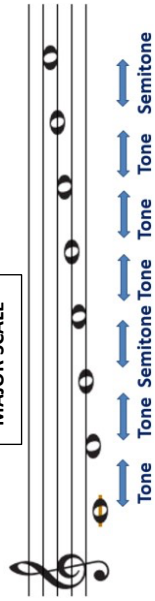
PITCH – Change the highness or lowness of the theme – e.g. in <i>different</i> OCTAVES	DYNAMICS Change the volume of the theme . 	TEXTURE Change the amount of sound we hear – play as a SOLO , add an ACCOMPANIMENT or CHORDS , add a COUNTER-MELODY (an 'extra' melody that is played or sung at the same time 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

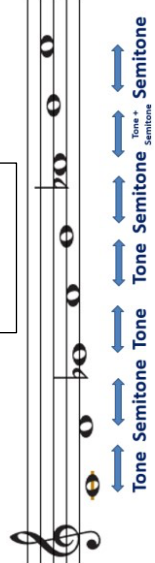
TONALITY refers to whether a **THEME** or **MELODY** is in a **MAJOR** or **MINOR** key. Changing the tonality from major to minor or minor to major is one way of providing a variation on the theme of melody.



MAJOR SCALE



MINOR SCALE



E. Inversion and Retrograde

INVERSION – Changing the theme so that they are upside down from the original.

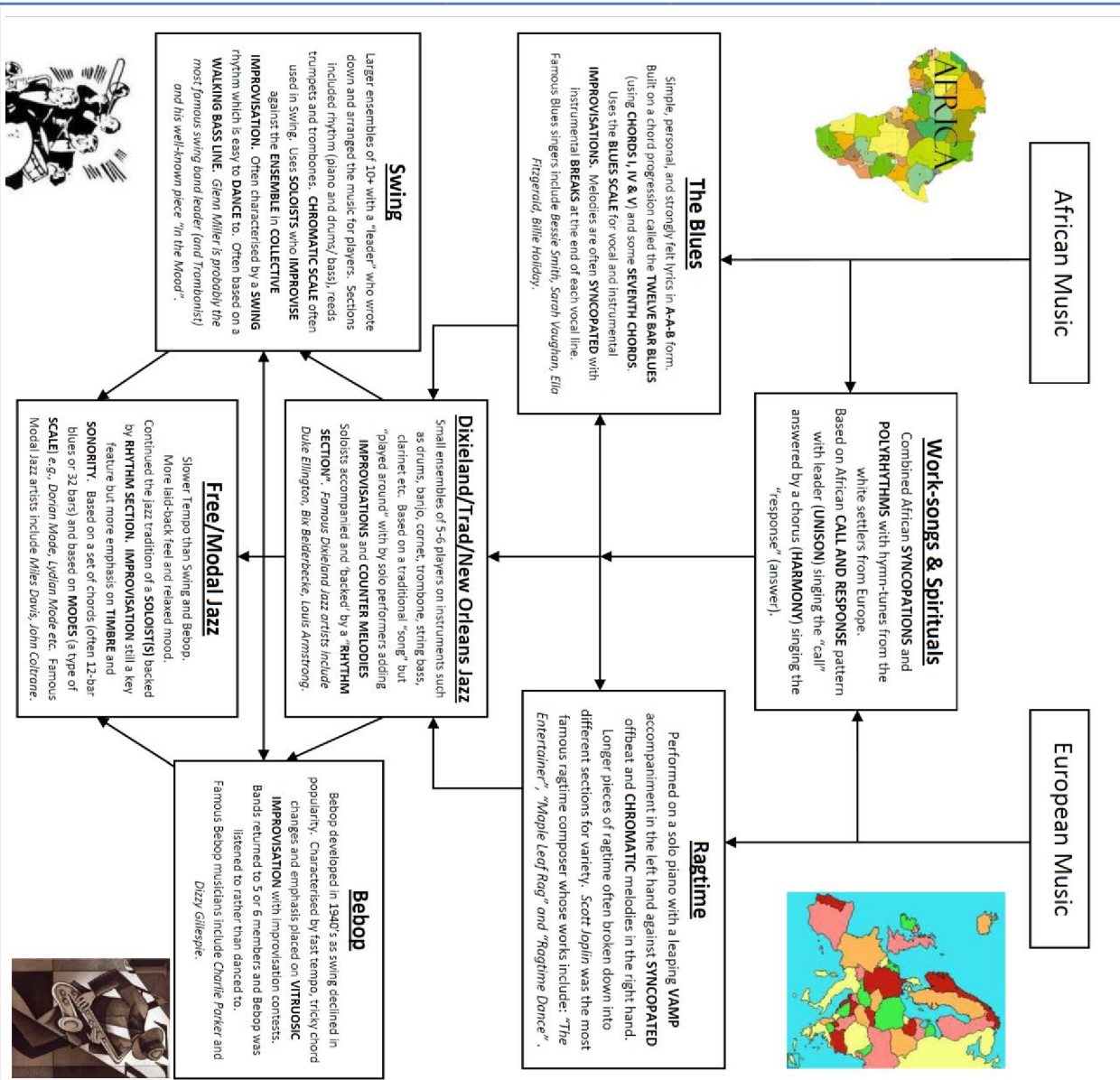
RETROGRADE –Arranging the main theme backwards.

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 IV	CHORD IV	CHORD I
CHORD V	CHORD IV	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

Electric Guitar (or could be Acoustic)

Piano

TRUMPETS

TROMBONES

SAXOPHONES

CLARINETS

RHYTHM SECTION (Accompaniment and Backing)

FRONTLINE INSTRUMENTS ("REEDS")

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

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.

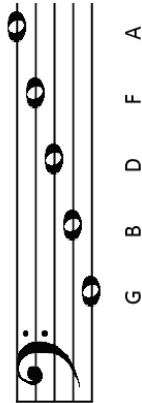
The position of notes on the staff or staff shows their **PITCH** (how high or low a note is).

The **BASS CLEF** is a symbol used to show low-pitched notes on the staff 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 staff or staff is made up of 5 **LINE**S and 4 **SPACE**S.

Notes on the **LINE**S of the **BASS CLEF: G, B, D, F, A**

Green Buses Drive Fast Always

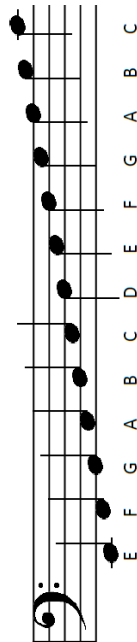


Notes in the **SPACE**S of the **BASS CLEF: A, C, E, G**

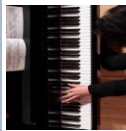
All Cows Eat Grass



Bass Clef STAFF NOTATION:



B. Musical Instruments that use the Bass Clef



Left Hand of a Piano/Keyboard
& Pedals of an Organ



Bassoon



Cello



Double Bass



Trombone



Tuba



Timpani



Bass Guitar



Bass (deepest male singing voice)

C. Bass Line Patterns

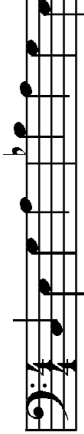
BASS RIFFS – Short, repeated, ‘catchy’ and memorable Bass Line

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

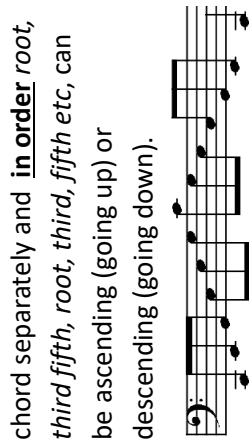
(**PASSING NOTES**) to make them more memorable.



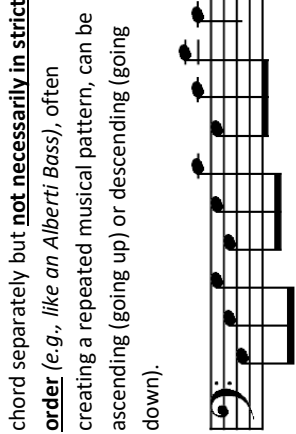
WALKING BASS – used in Jazz, Blues, Rhythm and Blues, and Rock’n’roll, and featuring a **note on every beat**. Using the **ROOT, THIRD** and **FIFTH** of the chord, and ‘**EXTRA**’ notes (called **PASSING NOTES**) to create a smooth bass line often moving mainly by step (**CONJUNCT**).



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).



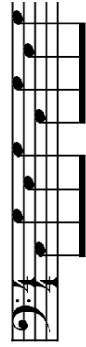
BROKEN CHORD – Playing the notes of a chord separately but **not necessarily in strict order** (e.g., like an *Alberti Bass*), often creating a repeated musical pattern, can be ascending (going up) or descending (going down).



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 <i>Lowest</i>	FIFTH <i>Highest</i>	THIRD <i>Middle</i>	FIFTH <i>Highest</i>
------------------------------	--------------------------------	-------------------------------	--------------------------------

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.



(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

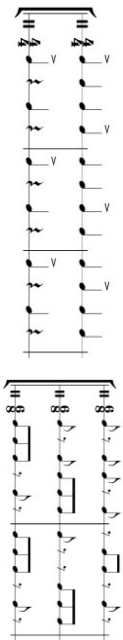
African instruments are often made from plants and animal products such as hide and bone. African musicians are very fond of **PERCUSSION** instruments and use a wide variety of drums (called **MEMBRANOPHONES**). Drums are traditionally used as an accompaniment to singing, dancing, working and communicating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



Characteristic Rhythms and Metres, Traditional Rhythm Patterns

Repetition and Ostinato

REPETITION and **CYCLIC RHYTHMS** used to organise music. A repeated rhythm pattern (**OSTINATO** or **TIMELINE**) is used as a basis for **IMPROVISATION**. Use of **SYNCOPIATION**, **POLYRHYTHMS** (shown below right), **CYCLIC RHYTHMS** and **CROSSRHYTHMS** (shown below left).



Texture

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.

Pitch & Melody and Harmony & Tonality

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**).

Ornamentation

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.

Ensemble

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**.

Form & Structure and

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

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.

Musical Characteristics of Folk Music

Traditional drums such as the **DIEMBE**, **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.

Impact of Modern Technology on Traditional Music

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.

Artists, Bands & Performers of African Drumming



Bolokada Conde



Ladysmith Black Mambazo

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



8.1 Ethics and Morality

Key Construct: P2. Moral and ethical issues are influenced by religious and non-religious beliefs.

Enquiry Questions:

3.3 Why are people **good and bad**?

3.2 Should Christians be **greener** than everyone else?

Section C: Core Content

Section A: Key Vocabulary	
1.	Morality —a persons unique understanding of what is right and wrong.
2.	Stewardship —the belief that humans are caretakers of the earth and it's resources.
3.	Dominion —the belief that humans are rulers of the earth and it's resources.
4.	Sanctity of Life —the belief that life is sacred and should be protected.
5.	Animal Rights — laws and policies designed to stop animal mistreatments and abuse.

A) Morality

How do we make moral decisions?

Moral Compass: Conscience

Past experiences: Religious leaders e.g. Jesus/Muhammad

Reason/logic: Community leaders e.g. priests, politicians, celebs

The Law

Inspiration from moral exemplars, e.g. MLK/ Malala/ Gandhi

Holy Texts e.g. The Bible/ Qur'an

B)

And God said, Let there be light: and there was light.

And God saw the light, that it was good: and God divided the light from the darkness.

Genesis 1:3-4

C)

SANCTITY OF LIFE

D)

WE CAN'T CALL IT ANIMAL ABUSE

BE THEIR VOICE ANIMAL ABUSE

ANIMALS MUST

CRUELTY

⇒ Morality and moral behaviour is **unique** to each individual. It is influenced by multiple things; some things have a greater **influence on our behaviour** than others. Sometimes we might be influenced by something we don't even know about.

⇒ **Buddhists** aim to follow the **five precepts** to develop good moral character. The five precepts are: Do not take a life, do not take what is not given, do not overindulge the senses, do not speak wrongfully, do not misuse substances to cloud the mind.

⇒ Most **humanists/atheists** believe in '**the greatest good for the greatest number**' so try to live a life which allows others to **flourish** and support **Human Rights** for all.

⇒ For some people morality is **set and doesn't change**, this is called **absolute morality**. For others morality can and should **depend on the situation**, this is called **relative morality**.

⇒ The book of **Genesis, chapter 1** describes how **God created the universe out of nothing** (ex nihilo) in **six days**.

⇒ **Genesis, chapter 2** describes how he **appointed Adam** (the first man) and **Eve** (the first woman) **stewards** and rulers of "**all the creatures that creep upon the earth**".

⇒ **Genesis, chapter 3** describes how **Adam and Eve disobeyed God's commandment** not to take from the forbidden tree and are **banished** from the Garden of Eden; this is known as **The Fall**.

⇒ The words '**light**' and '**good**' are used in the account to show that what God created was pure and only full of goodness. Many believe that when **Adam and Eve** were banished this is when **sin (evil/ wrongdoing)** entered the world.

⇒ Jews, Christians and Muslims all believe in the **sanctity of Life**, which means that life is sacred because it is **created by God** and he wants us to be good, like we were at the start. However human actions have taken what was good and slowly **destroyed it** by not taking our **responsibilities** as 'stewards' seriously.

⇒ **All religions teach that the life is sacred** for various reasons; usually because they believe it is created or sustained by God.

⇒ **Christians** believe that not only are we created by God but also our souls connect us to God and **our bodies are temples for our souls**, therefore our bodies need to be taken care of.

⇒ **Hindus** believe all life is sacred because we all have a part of God (Brahman) within us. Therefore **if we harm a life we harm God**. This would create **negative karma** and go against our **sacred duty (dharma)**.

⇒ Despite these beliefs being similar, many religious people disagree about how human life should be treated and what should be allowed or banned. Some **ethical issues** which challenge religious believers are: **experimentation** (testing products out before we know they are safe), **cloning** (creating human replicas in a lab) and **blood transfusion** (taking another persons blood).

⇒ **Vivisection** is the use of animals for experiments; these can be for cosmetic or medical purposes.

⇒ **Zoos and safaris** use animals for entertainment and profit; often the enclosures and treatment of the animals are not considered appropriate. Some people believe zoos and safaris should be banned.

⇒ The use of animals for **sport** e.g. horse/dog racing, fishing and hunting is often challenged due to the **exploitation** of animals.

⇒ In the UK, **farming and agriculture** has strict rules about the conditions animals can be raised in.

Section B: Component Knowledge	
1.	Morality can be absolute (never changing) or relative (depending on the circumstances).
2.	The book of Genesis, in the Bible, describes how and why God intentionally created every thing.
3.	Stewardship is the belief that humans are the caretakers of the earth.
4.	Sanctity of Life is the belief that all life is sacred (because it is God-given).
5.	Many people believe that animals should have the rights to live free from human

Learning Milestone Tasks

Can you create a series of images to show what happens in Genesis 1, 2 & 3?

Can you explain why some people believe they are stewards and others believe they are rulers?

Can you create a poster to teach people about the sanctity of life?

Can you explain what ethical issues religious people disagree on and why?

Can you create a campaign to raise awareness of animal rights issues?

8.2 Who or what is God?

Key Construct: R4. The term 'God' refers to a divine being which provides meaning to people's.

Enquiry Questions:
3.1 What does it mean for Christians to believe in God as **Trinity**?

Section A: Key Vocabulary
1. Holy Trinity — the Christian belief in God the Father, God the Son and God the Holy Spirit.
2. Monotheist — to believe in only one God.
3. Incarinate — to be born in human (flesh) form.
4. Worship — to show deep adoration or praise for something.
5. Pentecost — the Christian festival celebrating the descent of the Holy Spirit.

Section B: Component Knowledge
1. Theists can believe in one God (monotheist) or many gods (polytheist).
2. Most atheists reject the idea of God because of a lack of scientific proof and because suffering exists.
3. Christians believe in God the Father as the creator and judge of all life.
4. Christians believe God the Son is Jesus who came to earth in human form to teach and inspire followers of God.
5. Christians believe God the Holy Spirit is a guide and comfort on a daily basis and is

Section C: Core Content	
<p>A) How many?</p> 	<ul style="list-style-type: none"> ⇒ Monotheist religions believe there is one God only; these religions include Judaism, Christianity, Islam and Sikhi. ⇒ Polytheist religions believe there are multiple Gods (and Goddesses); these religions include Hinduism, Paganism, Maori and ancient religions like in Greek and Roman traditions. ⇒ Theists use language (holy texts/words), imagery (paintings/symbols) and also artefacts (statues/icons) to try to convey what they believe God is like. ⇒ Words most commonly used to describe God/gods are: omnipotent (all-powerful), omnibenevolent (all-loving) omniscient (all-knowing) and omnipresent (all present).
<p>B) Looking for God...</p> 	<ul style="list-style-type: none"> ⇒ The Cosmological Argument states that God must exist because everything has a cause and God is the only being powerful enough to cause the universe. Therefore God must exist. ⇒ The Teleological Argument states that God must exist because the world appears to be designed because things are too complex to have occurred randomly, therefore there must have been a creator/God. ⇒ Science and technology argue that God does not exist because they haven't found any definite trace or proof of it. ⇒ Atheists and agnostics argue that God cannot exist because if he did there were wouldn't be any suffering or natural disasters as God would surely fix the worlds problems.
<p>C) The Holy Trinity</p> 	<ul style="list-style-type: none"> ⇒ Many Christians believe that God can be understood as three separate persons; the Father, Son and Holy Spirit. These are three different but they are all God. This is called a holy mystery as they are completely different, but totally the same. ⇒ God the Father is the creator and judge of all things. The six days of creation is a demonstration of the omnipotence (all powerful) of God the Father. ⇒ God the Son is also known as Jesus and is significant for most Christians as it is when God became human (incarnate). This gives God a unique understanding of what it is like to be human. ⇒ God the Holy Spirit was sent by Jesus after he died and returned to heaven to help his disciples. The Holy Spirit is used in worship and is celebrated most during a time called Pentecost.
<p>D) Worshipping God</p> 	<ul style="list-style-type: none"> ⇒ Muslims remember Allah and all his attributes by reciting the 99 names of Allah; they use prayer beads to help them keep track. They do this alongside praying 3-5 times a day. ⇒ In Christianity, the Pentecostal and Quaker churches place a lot of emphasis on the Holy Spirit to help them hear from and focus on God. They believe that the Holy spirit is very active in their worship - maybe speaking in tongues (an unknown language) or giving prophecies (messages). ⇒ Many churches are named Holy Trinity as a sign of the importance of this belief. Many universities and schools in Britain are named after the Trinity too. ⇒ Important events in a Christian's life (rites of passage) often refer to the Holy Trinity for example Baptism/Christening.

Learning Milestone Tasks				
Can you explain the difference between what Christians and Hindus believe about God?	Can you construct an argument for God's existence?	Can you construct an argument against God's existence?	Can you create and label the symbol of the Holy Trinity?	Can you describe different ways of worshipping God?

8.3 Life After Death

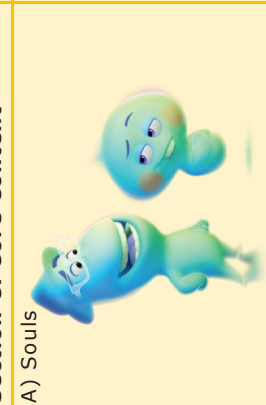
Key Construct: P3. Religious and non-religious philosophy aims to answer unanswerable questions about the

Enquiry Questions:

3.15 How far does it make a difference if you believe in **life after death**?

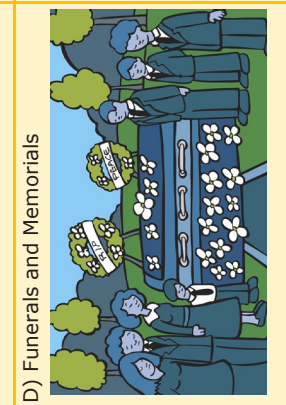
Section C: Core Content

Section A: Key Vocabulary
1. Soul — the non-physical part of a person which continues after death.
2. Resurrection — coming back to life after your body dies.
3. Remanifestation — to be born again in a new form after your body dies.
4. Eternity — something that lasts forever and does not end.
5. Funeral — a ceremony performed after a person dies.



<p>↑ Theists mostly believe that there are two elements to human life; the body (physical) and the soul (non-physical/spiritual). This is called dualism.</p> <p>↑ Atheists (and some agnostics) tend to believe that there is only one element to human life; the body. This is called materialism.</p> <p>↑ Souls are sometimes referred to as the 'divine spark' and is thought to be connected to, or part of, God. This means they are immortal like God and can take on different forms.</p> <p>↑ For theists, souls carry the effects of good and bad deeds and is judged after a person dies. It is the soul which goes on to the next phase/afterlife.</p>
<p>↑ Jews, Christians and Muslims believe a soul has one life and it is a single, straight line; from birth to death and then it is resurrected and sent to either heaven or hell. This view of life is called 'linear'.</p> <p>↑ Hindus, Buddhists and Sikhs believe a soul can have many lives. They see life as a cycle where a soul is remanifested over and over again. A soul can take many different forms, from animal, to human and even as a plant. Eventually, the soul will hopefully be released from the cycle. This view of life is called 'cyclic'.</p> <p>↑ Humanists/Atheists believe there is no soul, therefore there is no afterlife. The body returns to nothingness and that person only lives on in the memories of those still alive.</p>

Section B: Component Knowledge
1. Some people believe in souls exist (dualists) and others do not (materialists).
2. Christians, Muslims and Jews believe in a linear life which starts as physical and then becomes spiritual after death
3. Hindus, Buddhists and Sikhs believe in a cyclic life which means a soul has multiple lives in multiple bodies
4. Heaven is a place where good souls go as a reward and hell is a place for bad souls to be punished.
5. Funerals are rituals performed after a person has died to remember their life and send them to the afterlife.



<p>↑ Holy texts contain many different descriptions of heaven, hell and other places for souls to go after death for eternity. There is also much artwork created to show these places.</p> <p>↑ Heaven is a place where there is no evil or suffering. Texts say that it is where God and our loved ones are waiting for us, and it is where we are rewarded for a life well-lived. Everything you need and desire is given to you in heaven and will be pure peace and joy!</p> <p>↑ Hell is a place full of pain and suffering. It is believed to be a place where a person is tormented and tortured for sins committed. Medieval art shows Hell as a frightening place of fire, darkness and destruction.</p> <p>↑ Some theists reject the idea of Hell completely and say that an all-loving God would not have a place of such suffering.</p> <p>↑ These places are usually thought of as supernatural/spiritual worlds, somewhere only our souls go. But others believe them to be physical so we will be given a new (resurrected) body to have for eternity.</p>
<p>↑ A funeral is a ceremony connected with a burial or cremation for a person who has died. Funerals are specifically designed to reflect religious beliefs used by a culture to remember the dead.</p> <p>↑ Key aspects of a Christian funeral include: eulogy (speech about the deceased), prayers (to help the soul get to heaven), coffin (to keep the body intact), the committal (when the coffin is lowered into ground or taken away for cremation).</p> <p>↑ Key aspects of a Hindu funeral include: a lamp (placed by the head of the body), prayers, religious songs, pindas (rice balls) are placed in the coffin, water is sprinkled on the body and a mala (necklace of wooden beads or flowers) may be put around the dead person's neck.</p> <p>↑ Funerals are considered a vital part of a persons religious life and without a funeral many believe</p>

Learning Milestone Tasks

Can you create a series of symbols for the key vocabulary?

Can you explain the difference between a linear and cyclic life view?

Can you describe your idea of heaven and/or hell?

Can you create a timeline of a Christian funeral?

Can you give some reasons why Humanists and Atheists reject the idea of an afterlife?





78.4 Buddhist Beliefs and Teachings

Enquiry Question:
3.8 The Buddha: how and why do his experiences and teachings have meaning for people today?

Key Construct: R2. Beliefs and teachings are what form the basis of a religion.

Section A: Key Vocabulary	
1. Tri-Ratna — the three refuges/ jewels; Buddha, dhamma and sangha.	
2. Buddha — a person who finds enlightenment, the title given to Prince Siddhartha Gautama.	
3. Dhamma — the teachings of the Buddha	
4. Sangha — the worldwide community of Buddhists.	
5. Enlightenment — eternal peace and wisdom beyond human understanding.	

Section B: Component Knowledge	
1. Buddhism focuses on finding the middle way which is a life between your desires or indulgences and suffering.	
2. The Buddha is not a god, he was a human prince who attained enlightenment roughly 2500 years ago.	
3. Buddhist teaching aims to teach Buddhists the roots of suffering and how it can be overcome.	
4. Buddhists believe nothing is permanent and we cause suffering by craving material things.	
5. Enlightenment ends suffering by breaking our attachment to material things.	

Section C: Core Content	
A) Tri-Ratna / Enlightenment	 
B) Buddha (life and image of Buddha)	
C) Dhamma (teachings)	<p>THREE MARKS OF EXISTENCE Dukkha-Anicca-Anata</p> <p>THE FOUR NOBLE TRUTHS Dukkha-Samudaya-Nirodha-Marga</p> <p>THE NOBLE EIGHTFOLD PATH Understanding-Intention-Speech-Action-Livelihood-Effort-Concentration-Mindfulness</p>
D) Sangha (community)	
	<p>⇒ The symbol of the Tri-Ratna reminds Buddhists what is truly important in life.</p> <p>⇒ The three colours represent the Buddha, the Dhamma, the Sangha. The lotus flower represents enlightenment. The circle represents the eternity of life's cycle and the universe. Fire is present for protection and cleansing.</p> <p>⇒ If a person gains Enlightenment (like the Buddha) they can break out of the cycle of rebirth, to a place of eternal peace that is known as 'Nirvana'.</p> <p>⇒ In images of Buddha, his face is made to look calm and serene, to show that he has found peace.</p> <p>⇒ Prince Siddhartha Gautama was born north of India.</p> <p>⇒ Before he was born his mother had a sacred dream which told her baby was going to be unique. His parents were told that he would become either a great ruler or a spiritual leader.</p> <p>⇒ After the death of his mother, his father feared he would abandon his throne if he became too curious about life so the King kept the Prince from seeing any suffering by keeping his life luxurious within the palace.</p> <p>⇒ Dissatisfied with this, Siddhartha left the palace which is when he saw FOUR SIGHTS: old age, sickness, death and then a seeker (holy man) who told him the only thing that doesn't die or get old/sick is truth. He decided to leave his comfortable life to see if he could find the truth about suffering.</p> <p>⇒ Buddha tried a life of deprivation and starvation but after 6 years he realised this was not the way so he found a middle way between desire/indulgence and suffering. Through living this way he achieved enlightenment.</p> <p>⇒ The most significant teachings of Buddhism are: The Three Marks of Existence; The Four Noble Truths; and The Noble Eightfold Path.</p> <p>⇒ Anicca is the first of the Three Marks of Existence and it states that nothing is permanent.</p> <p>⇒ The Four Noble Truths are: Dukkha – human life is full of suffering and sorrow; Samudaya – suffering and sorrow is caused by tanha ('craving'); Nirodha – suffering and sorrow can end if you reach nirvana (enlightenment); Marga – the Eightfold Path is the path to nirvana.</p> <p>⇒ The Eightfold Path is involves: Right Understanding, Right Intention, Right Speech, Right Action, Right Livelihood, Right Effort, Right Concentration, Right Mindfulness.</p> <p>⇒ The word 'sangha', in the ancient Indian languages of Sanskrit and Pali, means 'group' or 'assembly'. It is used in Buddhism to refer to the whole community of Buddhists worldwide (approx. 500 million people)</p> <p>⇒ Most are ordinary people with families, jobs, homes and pets – known as lay Buddhists</p> <p>⇒ Some decide to devote all of their time to the Buddhist path and become monks (Bhikkhus) or nuns (Bhikkhunis). These monks and nuns make up the monastic sangha, and they choose to live in a monastery/temple (vihara). In some countries, viharas are also schools.</p> <p>⇒ There are two main branches (denominations) of Buddhism. Mahayana, which means 'great vehicle' and Theravada, which means 'way of the elders'.</p>

Learning Milestone Tasks

Can you explain how why Buddhism is called 'the middle way'?

Can you describe how Siddhartha might have felt living in the palace before and after he sees the 4 sights?

Can you explain which of Buddha's teachings you agree most and least with and why?

Can you describe the difference between a lay Buddhist and a monk/nun?

Can you explain why the Triratna symbol is so important to Buddhists?

8.5 Jewish

Beliefs and Teachings

Key Construct: R2. Beliefs and teachings are what form the basis of a religion.

Section A: Key Vocabulary

- Covenant** — a promise or agreement made between God and humans.
- Mitzvot** — a set of 613 commandments or rules given to the Jews.
- Shabbat** — Friday dinner to start the Sabbath (day of rest)
- Rabbi** — means 'teacher', a person who leads worship
- Anti-Semitism** — prejudice and discrimination against the Jewish community

Section B: Component Knowledge

- Judaism consists of 613 commandments given to Moses, this is called the Mitzvot.
- There are two covenants with God, one made by Abraham and one made by Moses which Jews today are still expected to uphold.
- Rabbis are responsible for guiding and teaching Jews today.
- Jews worship every Friday by having Shabbat dinner followed by a day of rest (Sabbath).
- Anti-Semitism is still a problem for today's Jews as they experience prejudice and discrimination.

Section C: Core Content

A) Judaism



Judaism began nearly **4,000yrs** ago in the Middle East, which is on the borders of Asia, Africa and Europe. Today there are approximately **18million** Jews, most of which live in **Israel or the USA**.
 Jews believe that a Jew is someone who is the child of a **Jewish mother** - someone who isn't born a Jew can **convert** to Judaism, but it is not easy to do so.
 The religion of Judaism is constructed around the **613 commandments** given to Moses and his descendants. **This is called the mitzvot**.
 There are two main **denominations** (groups) in Judaism—they are called **Orthodox and Reform**.

B) Forefathers



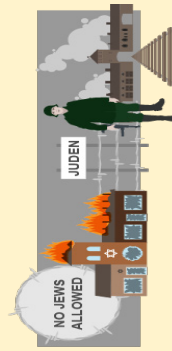
Abraham (Father of Monotheism) was **tested by God** many time and because of his devotion God made a **covenant** (agreement) with him. As long as Abraham's descendants **remain faithful** God will provide them with: the promised **land**, the promise of the **descendants**, the promise of **blessing and redemption**. **This is the Abrahamic Covenant**.
 Later, a man named **Moses** saved the Jewish people from **persecution in Egypt** when he led them to safety across the Red Sea. After this, the Jews lived in the desert where God gave Moses a set of rules (mitzvot) which they should live by, including the **Ten Commandments**. Moses is the **most important Jewish prophet**. **This is the Mosaic Covenant**.
 Today the Jewish communities are lead by **rabbis** - a respected and educated person who has studied and **understands the sacred texts** and traditions of Judaism.

C) Being Jewish today



Jewish worship can take place at the **Synagogue** or at home. Worship can be **studying the Torah** (holy text), saying personal **prayers** or attending a **service lead by a rabbi**.
Shabbat (the Sabbath) begins on **Friday evenings** and ends at **sunset on Saturdays**. During Shabbat, Jews remember that God created the world and on the seventh day he rested.
 Jewish boys (age 13) and girls (age 12) will have ceremonies called **Bar Mitzvah** (boys) and **Bat Mitzvah** (girls) to celebrate their **transition to adulthood** and they will **make their promises** to live according to the mitzvot (Jewish laws).
Passover is a celebration of the story of **Exodus**. During Passover, Jews remember how their ancestors **left slavery behind them** when they were led out of Egypt by Moses. On the evening before Passover starts, Jews have a special service called a **Seder** (Order) where they retell the story.

D) The Holocaust / Anti-Semitism



In Germany, Adolf Hitler fed into existing anti-Semitism by **blaming the Jewish people for Germany's defeat in WW1**. Nazi scientists incorrectly claimed that the Jewish people were **sub-human**. When WW2 broke out, Hitler used this as an opportunity to commit **genocide** (mass murder) of nearly **12million Jews**.
 After WW2 and when the scale of the Holocaust tragedy came to light, 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**.
 Despite this there are still small pockets of Anti-Semitism within society. This means that sometimes **Jewish people experience discrimination, violence and abuse** as well as synagogues occasionally being damaged. This is **rare and illegal** but the law requires it to be dealt with.

Enquiry Question:

3.11 What is good and what is challenging about being a **Jewish teenager in the UK today**?

Learning Milestone Tasks

Can you explain what the mitzvot is and why it is important?

Can you create a profile description for Abraham and Moses?

Can you say why rabbis are important for Jews today?

Can you create a series of illustrations to show Jewish worship?

Can you create an Anti-Semitism poster to make Jews feel more welcome in society?

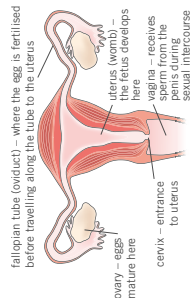
Adolescence

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**.

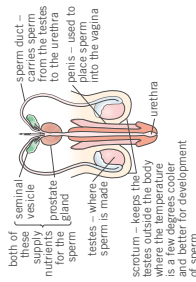
Girls	Boys
breasts develop, ovaries start to release egg cells, periods start, hips widen,	voice breaks, sexual organs develop, testes start to produce sperm, shoulders widen, hair grows on face and chest
pubic and underarm hair grows, body odour develops, emotional changes, growth spurt	

Reproductive systems

female



male

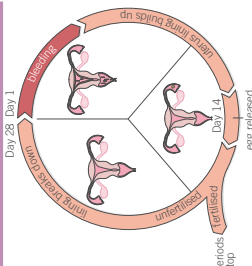


The menstrual cycle

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.



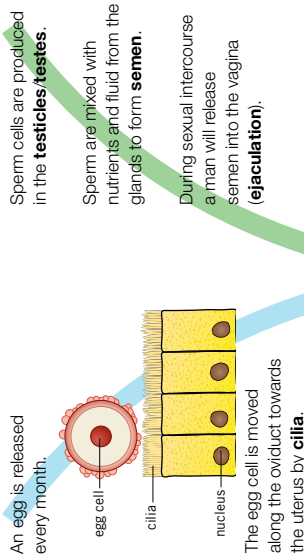
Methods of contraception

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.

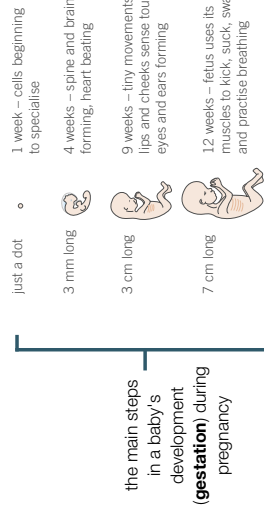
Human reproduction

Fertilisation



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

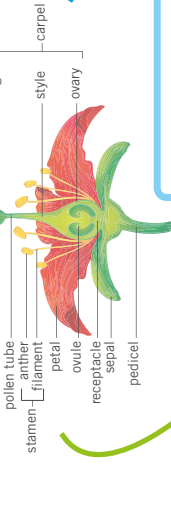
The fertilised egg may then **implant** in the uterus lining and form an **embryo** (ball of cells)



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**

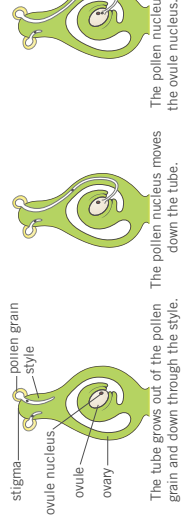
Pollination

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



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.



Make sure you can write definitions for these key terms.

- adolescence anther carpel 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

B2

Chapter 3: Adaptation and inheritance

Knowledge organiser

Activate
Question • Progress • Succeed

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

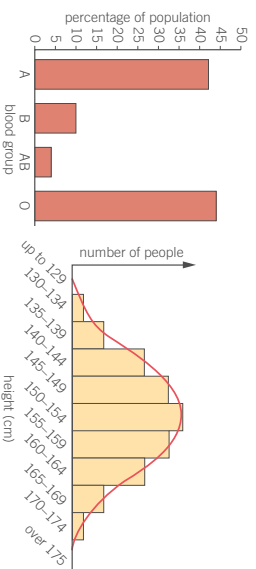
Many characteristics, such as height, are affected by both inherited and environmental variation.

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)



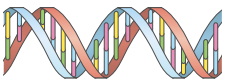
Discontinuous variation should be plotted on a bar chart, and continuous variation should be plotted on a histogram.

Inheritance

Characteristics

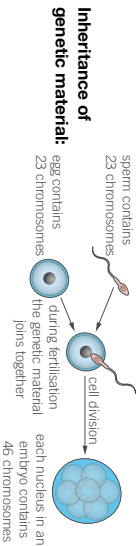
Characteristics are inherited from your parents through genetic material stored in the nucleus of cells.

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:

sperm contains 23 chromosomes
egg contains 23 chromosomes
during fertilisation the genetic material joins together
cell division
each nucleus in an embryo contains 46 chromosomes

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.

Natural selection

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

Organisms with the most useful characteristics survive and reproduce.

This is called 'survival of the fittest'.

Successful genes are passed on to the offspring.

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.

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 adaptation independent.

- 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.

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

Biology - Plants and Ecosystems 1

1 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

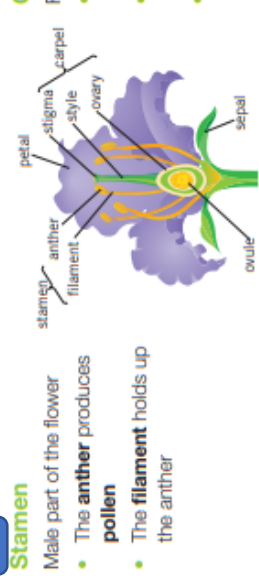


- **Producers** are the organisms which start the food chain, they convert energy from the Sun, making their own food, these are often plants
- **Prey** are organisms which are eaten by other organisms
- **Predators** are the organisms which eat the prey

2 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

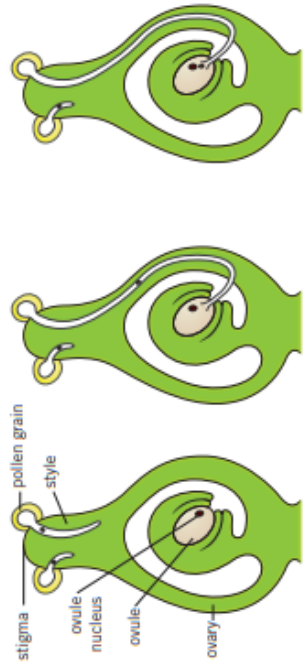
5 Parts of a flower



6 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

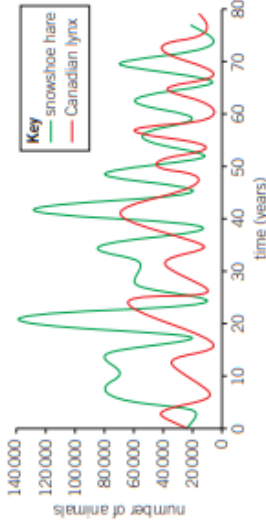


Germination is the process in which the **seed** begins to grow, for this to occur the seed needs:

- 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

4 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**

3 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

Key terms

Make sure you can write definitions for these key terms.

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

Biology - Plants and Ecosystems 2

1

Respiration

- Respiration is the process in which energy is released from the molecules of food which you eat
- Respiration happens in the mitochondria of the cell
- **Aerobic respiration** involves oxygen, it is more efficient as all of the food is broken down to release energy
glucose + oxygen → carbon dioxide + water
- The glucose is transported to the cells in the blood **plasma**
- The oxygen is transported to the cells in **red blood cells**, by binding with **haemoglobin**
- Carbon dioxide is a waste product and is transported from the cells to the lungs to be exhaled
- **Anaerobic respiration** is a type of respiration which does not use oxygen, it is used when the body cannot supply the cells with enough oxygen for aerobic respiration
- Anaerobic respiration releases less energy than aerobic respiration
glucose → lactic acid
- The **lactic acid** produced through anaerobic respiration can cause muscle cramps
- Lactic acid will build up if there is not enough oxygen present in the blood supply to break it down. This is known as an **oxygen debt**

2

Fermentation

- **Fermentation** is a type of anaerobic respiration which occurs in yeast
- Instead of producing lactic acid, yeast produces ethanol, which is a type of alcohol
glucose → ethanol + carbon dioxide
- This process can be used to form alcohol to drink or to allow bread and cakes to rise

3

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



Key terms

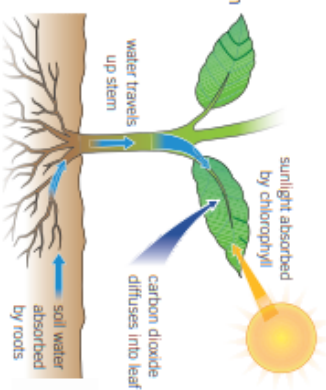
Make sure you can write definitions for these key terms.

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

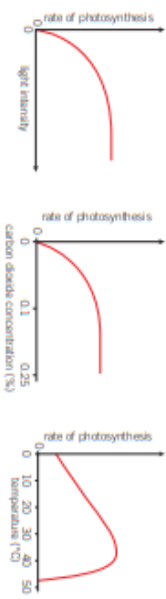
4

Photosynthesis

- **Photosynthesis** is the process which occurs in the chloroplasts to produce glucose using sunlight
- water + carbon dioxide + sunlight → glucose + oxygen
- Any organism that can use photosynthesis to produce its own food is known as a **producer**, these are not just limited to plants but can include other organisms such as **algae**



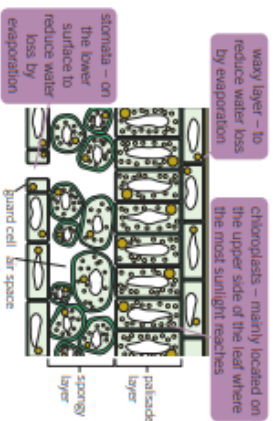
- The rate of photosynthesis can be affected by:
- Light intensity – the higher the light intensity the higher the rate of photosynthesis up to a point
- Carbon dioxide concentration – the higher the carbon dioxide concentration the higher the rate of photosynthesis up to a point
- Temperature – the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



5

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



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.

																		group number							0																							
																		3	4	5	6	7								He																		
																		B	C	N	O	F	Ne																									
																		Li	Be												Al	Si	P	S	Cl	Ar												
																		Na	Mg												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													
																		Ft	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:

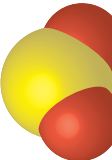
several of the same type of atom

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.

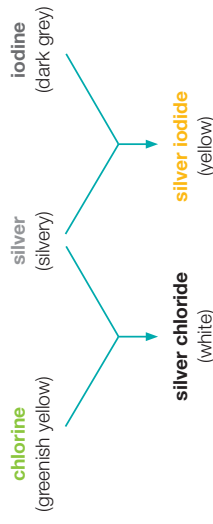
for example, *copper oxide*, *sodium chloride*

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

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																	He																				
hydrogen																	helium																				
Li	Be																	B	C	N	O	F	Ne														
lithium	beryllium																	boron	carbon	nitrogen	oxygen	fluorine	neon														
Na	Mg	Al	Si	P	S	Cl	Ar	Scandium	Titanium	Vanadium	Chromium	Manganese	Iron	Cobalt	Nickel	Copper	Zinc	Gallium	Germanium	Arsenic	Selenium	Bromine	Krypton														
sodium	magnesium	aluminium	silicon	phosphorus	sulfur	chlorine	argon	yttrium	zirconium	niobium	molybdenum	technetium	ruthenium	rhodium	palladium	silver	cadmium	indium	tin	antimony	tellurium	iodine	xenon														
K	Ca	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
potassium	calcium	potassium	calcium	scandium	titanium	vanadium	chromium	manganese	iron	cobalt	nickel	copper	zinc	gallium	germanium	arsenic	selenium	bromine	krypton	rubidium	strontium	yttrium	zirconium	niobium	molybdenum	technetium	ruthenium	rhodium	palladium	silver	cadmium	indium	tin	antimony	tellurium	iodine	xenon
Rb	Sr	Fr	Ra	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	Cesium	barium	lanthanum	hafnium	tantalum	tungsten	rhenium	osmium	iridium	platinum	gold	mercury	thallium	lead	bismuth	polonium	astatine	radon
caesium	barium	francium	radium	berthelium	hafnium	tantalum	tungsten	rhenium	osmium	iridium	platinum	gold	mercury	thallium	lead	bismuth	polonium	astatine	radon	francium	barium	berthelium	hafnium	tantalum	tungsten	rhenium	osmium	iridium	platinum	gold	mercury	thallium	lead	bismuth	polonium	astatine	radon

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**
- 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

solids liquids gases at room temperature

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: *potassium iodide + chlorine → potassium chloride + 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

- columns are called **groups**
- rows are called **periods**
- Elements in a group normally have similar properties, meaning chemists can predict properties of elements based on their group.

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

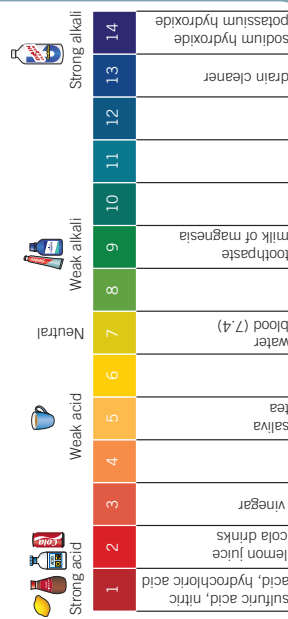
- A **chemical** reaction is a change in which atoms are rearranged to make new substances
- A **reversible** reaction is one where the products can react to get back the substances which you started with, most chemical reactions are not reversible
- You can look for signs that a chemical reaction has 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**

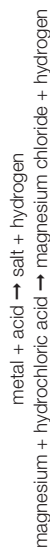
To see whether a substance is an acid or an alkali, we can use an **indicator**. Indicators show how acidic or how alkaline a solution is by showing its position on the **pH scale**, one example of this is **universal indicator**

- 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**

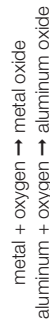


Metal reactions

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
- metal + water → metal hydroxide + hydrogen
- sodium + water → sodium hydroxide + hydrogen

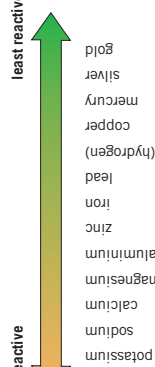
When a more reactive metal reacts with a compound containing a less reactive metal, it can take it's place, this is known as a **displacement** reaction



- If the metal on it's own is higher in the **reactivity series** than the metal in the compound a reaction will take place
- If the metal on it's 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



Salts

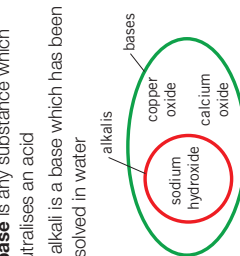
Salts are substances which are formed when an acid reacts with a metal or metal compound

Different acids form different types of salts:

- Hydrochloric acids form chloride
- Sulphuric acids form sulphates
- Nitric acids form nitrates

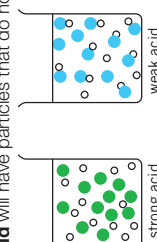
Neutralisation

- **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



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

Key terms

Make sure you can write definitions for these key terms.

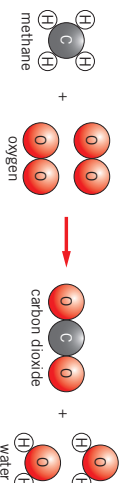
- acid, acidic, alkali, alkaline, base, chemical, chemical reaction, concentration, corrosive, displacement, hydroxide, indicator, irritant, neutral, neutralisation, oxide, oxidation, pH scale, reversible, reactivity, reactivity series, salt, strong acid, universal indicator, weak acid

C2 Chapter 6: Reactions

Knowledge organiser

Chemical reactions

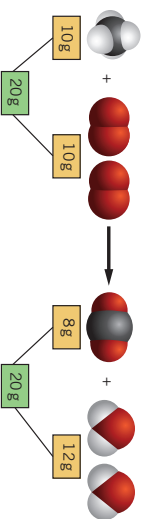
Word equations can represent a **chemical reaction**:



- 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



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

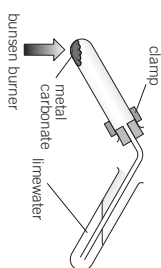
- balanced symbol equation chemical reaction combustion conserved conservation of mass decomposition fuel endothermic
- energy level diagram exothermic products reactants thermal decomposition

Combustion

- Combustion** is the burning of a **fuel** in oxygen
- A fuel is a substance which stores energy in a chemical store
- Examples of fuels include petrol, diesel, coal and hydrogen
- When a carbon based fuel undergoes combustion, it will produce water and carbon dioxide
 - methane + oxygen → carbon dioxide + water
- Hydrogen can also be used as a fuel, this is much better than traditional fossil fuels as it does not produce carbon dioxide:
 - hydrogen + oxygen → water

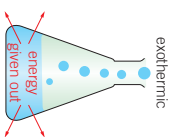
Thermal decomposition

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

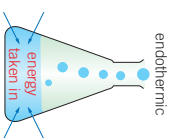


Exothermic and endothermic reactions

- Exothermic** reactions involve a transfer of energy from the reactants to the surroundings
- As energy is transferred to the surroundings this will show an increase in temperature
- Examples of exothermic reactions include combustion, freezing, and condensing

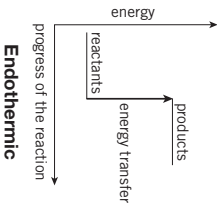
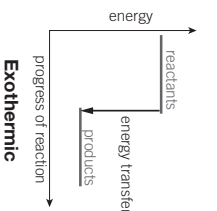


- Endothermic** reactions involve a transfer of energy from the surroundings to the reactants
- As energy is taken into the reactants a decrease in temperature will be shown
- Examples of endothermic reactions include thermal decomposition, melting, and boiling



Energy level diagrams

- Energy level diagrams** show the values of energy between the reactants and the products in a reaction
- If the energy is greater in the reactants than the products then the reaction is exothermic as energy has been given out to the surroundings
- If the energy is lower in the reactants than the products then the reaction is endothermic as energy has been taken in from the surroundings



Bond energies

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

P1

Chapter 3: Energy Knowledge organiser

Energy

- **Energy** is needed to make things happen
- It is measured in **joules** or **kilojoules**
- The **law of conservation of energy** says that energy cannot be created or destroyed, only transferred
- This means that the total energy before a change is always equal to the total energy after a change

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

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

Food and energy

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

Power and energy

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

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

Non-renewable energy

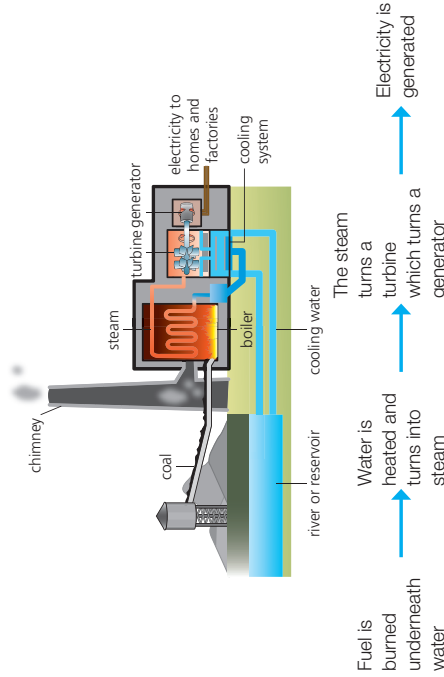
- **Non-renewable** energy cannot be replaced within your lifetime
- Non-renewable **energy resources** include coal, oil, natural gas and nuclear resources
- Coal, oil and natural gas are also known as **fossil fuels**, they release carbon dioxide when burned which contributes to global warming

Renewable energy

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

Power stations

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



Dissipation of energy

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

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

Key terms

Make sure you can write definitions for these key terms.

chemical dissipated efficiency elastic potential energy gravitational potential joules kinetic kilojoules
 law of conservation of energy non-renewable power renewable thermal watts

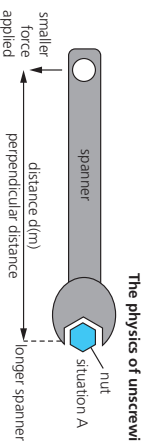
P2 Chapter 3: Energy Knowledge organiser

Activate
Question • Progress • Succeed

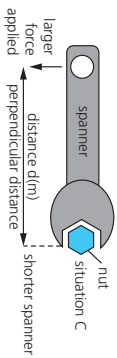
Work

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

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

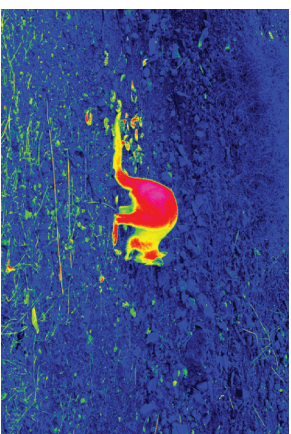


The physics of unscrewing a tight nut with a spanner



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**

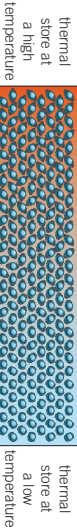


Energy and temperature

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

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

P1

Chapter 4: Space Knowledge organiser

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 Universe

contains billions of

Galaxies

contain billions of

Stars

are orbited by

Planets, asteroids, and comets

planets may have

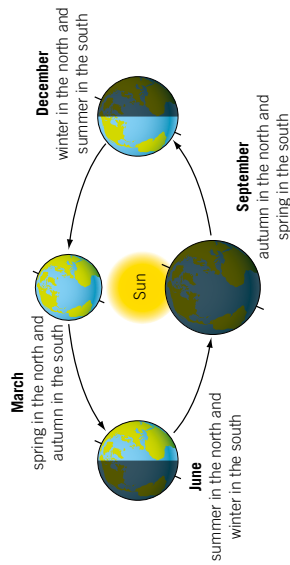
Moons

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).

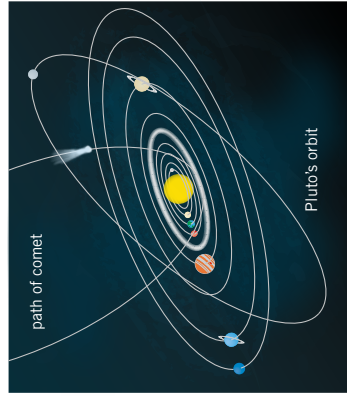


The Earth spins on its axis every 24 hours, giving us day and night.

The Solar System

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

- **Inner planets** – the **terrestrial** (rocky) planets
Mercury
Earth
Mars
Venus
- **Outer planets** – the **gas giants**
Jupiter
Uranus
Saturn
Neptune
- **Asteroid belt** (including the **dwarf planet** Ceres)
- **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.

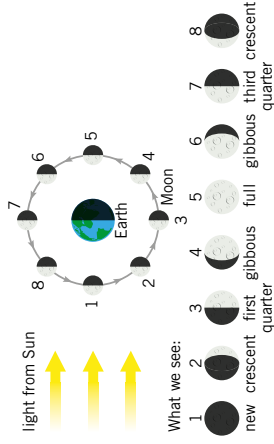
An **exoplanet** is a planet that is orbiting a star that is not the Sun.

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.

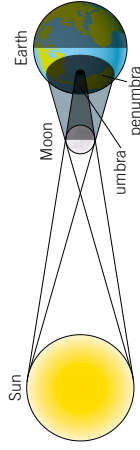
Phases of the moon

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



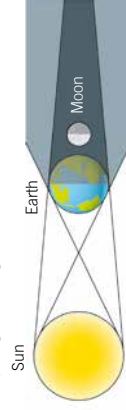
Solar eclipses

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
- terrestrial
- umbra
- Universe