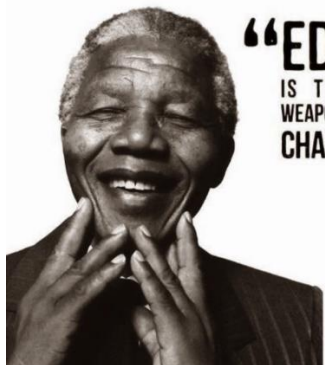# Westhoughton High School

Year 9 – Spring Term - Knowledge Organisers

"EDUCATION IS THE MOST POWERFUL WEAPON WHICH YOU CAN USE TO CHANGE THE WORLD."

NELSON MANDELA

Name: ....

Form Group & Room: ....

Form Tutor: ....

the "Knowledge" pyramid

- Success
- Feedback
- Results
- Actions
- Knowledge
- Learning
- Education

LEARN

- **L** — Look after each other
- **E** — Enjoy our school
- **A** — Aim high
- **R** — Respect one another, ourselves & our school community
- **N** — Never stop learning

Introduction

The curriculum in each of your subjects at WHS has been carefully planned to help you learn new things, building upon what you know and preparing you for learning in the future. This is mapped out as a learning journey which each teacher will share with you, so you understand how your learning fits together as a whole. Each subject's roadmap is here https://www.westhoughton-high.org/subjects/.
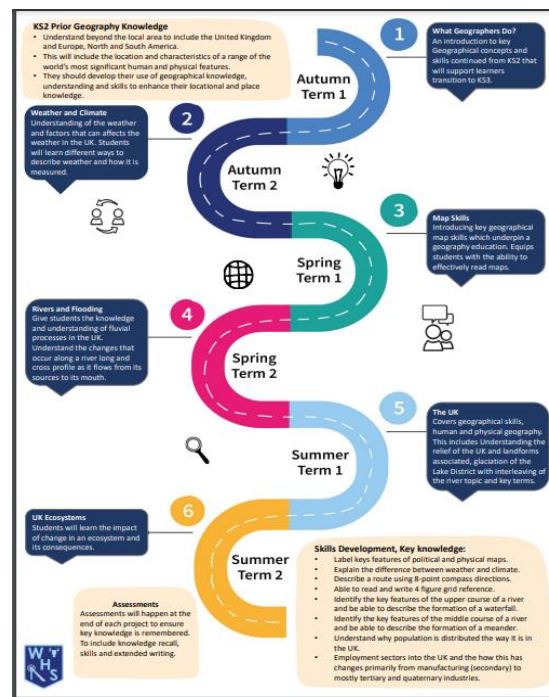
This booklet contains knowledge organisers for all the topics you will study in each subject this term. These give an overview of the essential knowledge that you MUST remember to be as successful as possible in Year 9 and as you move through each year of school. Your teachers will expect you to use them during lessons to find out about what you are going to be learning in a new topic, to retrieve information during a connect activity – connecting your brain to what you are going to learn that lesson and to test yourself or others to recall knowledge. You will also use them to complete home learning activities, to regularly revise from so that you begin to remember more knowledge over time, to discuss what you have been learning with family and friends and to catch up on any learning you might have missed due to absence. You must bring your booklet to school every day and keep it safe at the end of each term as you will continue to use it to support ongoing revision.

Learning Techniques to use with KOs – using them regularly is vital to make knowledge stick in your long-term memory (remember you need to revisit information at least 10 times before it is embedded in your memory).
Try using these ideas, choose different techniques to learn small sections of knowledge each day.

	Look, Say, Cover, Write, Check	Key Word Definitions	Flash Cards	Self-Quizzing	Mind Maps	Paired Retrieval
STEP 1	Look at and read aloud a specific area of your KO.	Write down the key words and definitions in two columns.	Use your KO to condense and write down key facts or information onto flash cards.	Use your KO to create a mini quiz. Write down your questions relating to the information.	Create a mind map with the information on your KO.	Ask a partner, friend or family to use the KO or your flash cards.
STEP 2	Cover or flip the KO over and write down everything you remember.	Repeat the above but don't look at your KO	Add pictures that might help you remember. Then self-quiz using the flash-cards.	Answer the questions, remember to use full sentences.	Check your KO to make sure there are no mistakes on your mind map.	Make sure they test you on different sections of the KO and also on previous topics.
STEP 3	Check what you have written down. Correct any mistakes and add anything you missed in purple pen.	Use a purple pen to check and correct your work	Ask a friend or family member to quiz you on your knowledge.	Ask a friend or family member to quiz you using the questions.	Try to make more connections, link the information together where you can.	Repeat this regularly so that you are frequently looking at KOs past and present.

3

How to make learning stick…
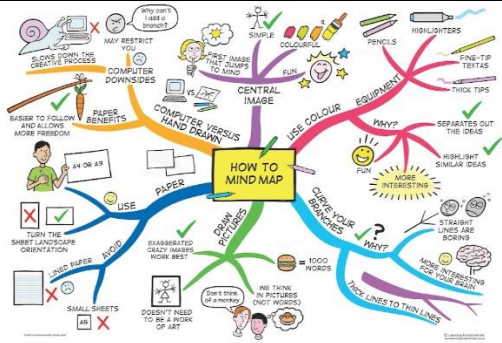
Mind Mapping	Flash Cards	Look, Say, Cover, Write, Check	Key Word Mnemonics	Revision Clocks
Mind mapping is a great way of representing key information from a topic in a visual way. Use colour and images to represent the knowledge you need to learn. Keep writing to a minimum; use only keywords/phrases. Watch the clip for more tips and advice. 	Make flash cards using your KO. Write a question on one side and the answer on the other or record key- words and definitions. Test yourself frequently. For more advice scan the code. 	This technique is one that has been well used from primary school upwards. It is useful for rehearsing keywords, definitions and spellings. Look at the information, read it aloud, cover it up, write it down and then check it is correct. 	A mnemonic is a sentence you make up where each word begins with the same letter as the word you want to remember. It is a useful technique for remembering a group of facts/words in a certain order. 	Draw a basic clock and break your KO down into 12 chunks. Make notes on each chunk in the 12 clock sections, use colour and images to make it memorable. Revise each section for 5 minutes, turn over and test how much you can recall. Watch the clip for more tips and advice.
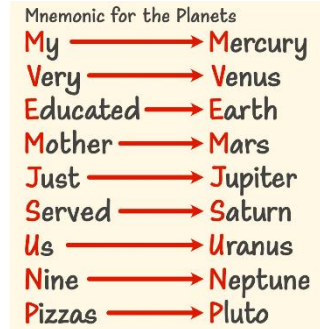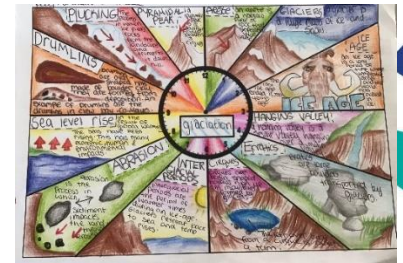
Year 9 Art Knowledge Organiser - Term 2

Drawing for Design

Design drawings, often the first visual representation of a project, are preliminary sketches and plans meticulously crafted by architects and engineers. These drawings encompass a range of details, from broad conceptual ideas to intricate specifications, all aimed at bringing a vision to life on paper.

Circus Font

Examples of font styles

Relief

Embellish

Harmonious Colours

Harmonious colours sit **next to each other** on the colour wheel. These colours work well together and can be blended into each other.

COMPLEMENTARY COLORS

RED + GREEN
BLUE + ORANGE
YELLOW + PURPLE
YELLOW-ORANGE + BLUE-VIOLET
RED-ORANGE + BLUE-GREEN
RED-VIOLET + YELLOW-GREEN

Templates
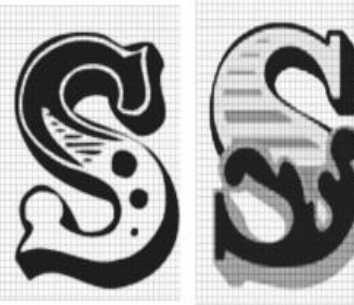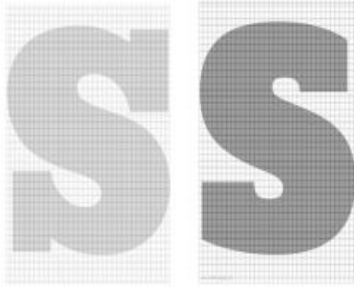
Year 9 key words

Design	A design is the concept of or proposal for an object, process, or system.
Complementary colours	Colours that are opposite on the colour wheel.
Acrylic	Acrylic paint is a fast-drying paint made of pigment suspended in acrylic polymer emulsion
Template	A design, mold or model used as a guidance to create the same design or shape with precision.
Score	To cut or mark with a line, scratch, or notch I scored the wood with a knife.
Relief	A relief carving is a sculpture with figures that protrude from a background, but are still attached to it.
Embellish	make (something) more attractive by the addition of decorative details or features.

Year 9 Talking with Type: Typography/ Graffiti Timeline

Prehistoric Visual Communications Petroglyphs

Archaic cuneiform

Chinese Characters

Darryl McCray ('Cornbread')

Shepard Fairey Political graffiti

Claw is female graffiti writer in New York

Ben Eine Typography Artist

3300 BCE

2900 BCE

1300 BCE

1960's Philadelphia

1980's-present:USA

1980's-present: USA

1980's-present: UK

3200 BCE

700 BCE

7th century BCE to present ADE

1970'S New York

1980's-present: USA

1980's-present: UK

Egyptian hieroglyphs

Latin alphabet, also known as the Roman alphabet

Devanagari is one of the official scripts of India

Jean-Michel Basquiat was a graffiti artist

Barbara Kruger

Joby Carter Fairground Sign writer

Prehistoric - Egyptian - Chinese - Roman   Indian - Graffiti Art - Neo Expressionism - PostModernism -Contemporary Typography

6

Computing — Modelling Data Spreadsheets

Year   Term

Key Facts

Where are Computer Models used?	Examples: Computer models are used in schools to predict student performance in exams, they are used to predict the weather, to predict how financial markets are going to change, to see whether car components will fit together before they are made and to see if a business is making enough money to stay open.
How are spreadsheets used in computer models?	Spreadsheets are very good at processing data and then presenting it in graphical form. Presenting data in the form of a chart makes it much easier to understand, which makes it more persuasive than a table of numbers.

Cell references begin with a letter, and finish with a number. EG: A1

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							

A range is a selection of cells. EG: A2:F4

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							

Golden rule: every formula always starts with an =

Name of the formula
See below for common formulae. Normally written in capitals.

=SUM(B10:B23)

= sign
An equal sign tells Excel that the cell contains a formula.

The selected range
The range used in the formula. This can be selected by clicking and dragging.

Key Term

Modelling	A program which has been developed to mimic a real life system. Spreadsheets use mathematical formulas and calculations to predict what is likely to happen based on data recorded about what actually did happen in the past. Software includes Microsoft Excel and Google Sheets.
Cell	One box on a spreadsheet. A group of cells together is called a **range**.
Cell Reference	The unique 'address' of a cell on a spreadsheet, made up of the Column letter and Row number, e.g. A1
Range	A group of cells that are next to each other, e.g. A2:B6
Active cell	The currently selected cell. It has a thick black line around it with a small dot called the fill handle in the bottom right corner
Row	A group of cells 1 cell **high** going across a worksheet. In Excel, these are the numbers down the left side of the page.
Column	A group of cells 1 cell **wide** going from the top to the bottom of a worksheet. In Excel these are the letters going across the top of the page.
Label	This is a piece of text that explains what the data in the cell next to it represents.
Absolute cell reference	Refers to a specific cell and doesn't change when copied to other cells using the fill handle. E.g.D3
Chart	A picture of data made from a range of cells. There are lots of types which are useful for different reasons, e.g. pie, line, scatter, area, radar, bar, radar etc
Legend	A table that explains which data is represented by different colours on a chart
Formula	Used in a spreadsheet cell, this **starts** with an '=' and combines numbers, mathematical operators and functions to manipulate data
Function	These are built in to spreadsheets and perform standard tasks, like finding the average, highest and lowest of a set of numbers. They always look like =FunctionName(Details the function needs). Tooltips will appear as you type them to tell you what details that function needs.
Fill	Copies the contents of a cell or range of cells into others by dragging the fill handle in the bottom right of the active cell or range.
Conditional Formatting	Changes what a cell looks like based on rules about the data a cell contains.

Cell Formatting

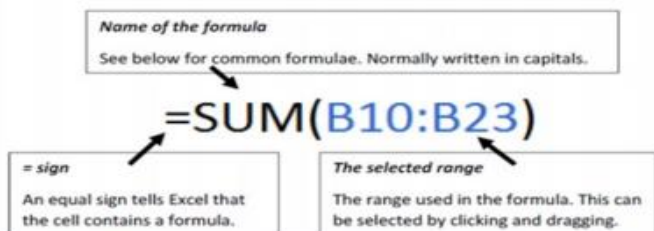|	
Number	tell the spreadsheet what type of data the cell contains, eg currency, percentage, date, time, etc
Alignment	align the text in the cell vertically (top, bottom or middle), horizontally (left or right) or at an angle
Font	change the font used, text size and colour
Border	add a solid, dotted, dashed or coloured border to the cell
Adjusting column width and row height	To adjust a column's or rows width or a row's height, move your mouse cursor between two columns or rows. Click and drag to resize.

Common and Advance Functions

= SUM( )	Adds a range of cells together.
=AVERAGE( )	Finds the average for a range of cells
=MIN( )	Returns the smallest value in the range
=MAX( )	Returns the highest value in the range
=COUNT()	Counts how many cells meet a condition, e.g. count(A:A, "April") would return the number of times the word April (with a capital letter), occurs in column A
=IF( )	Changes the value of a cell if something is true, e.g. if a customer's total bill is over £100, deduct 10% from their bill.
=COUNTIF ( )	Adds up cells that meet a certain rule, e.g. count the number of students that achieved level 6.
=VLOOKUP	Matches contents of a cell with an answer, e.g. How much is a pepperoni pizza?

Charts and Graphs

Column   Line   Pie   Bar   Area   Scatter   Other Charts

Charts and graphs provide a visual representation of data, which can often be easier to understand.. There are several types of charts and present data. You must always consider which would be a suitable chart or graph for your model.

LINE GRAPH – to show a change over time

PIE CHART – show the individual parts that make up a whole

BAR CHART – compare things that aren't directly related

SCATTER GRAPH – look for a pattern or link between two sets of data

Computing — Modelling Data Spreadsheets

Modelling Data Example - CASH FLOW FORECAST

	April	May	June	July	August	September	October	November	December	January	February	March
Cash Inflows												
Sales	£3,600	£7,200	£22,000	£26,000	£27,000	£25,200	£18,000	£21,600	£36,000	£18,000	£14,400	£18,000
Loans	£20,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Savings	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
TOTAL	£23,600	£7,200	£22,000	£26,000	£27,000	£25,200	£18,000	£21,600	£36,000	£18,000	£14,400	£18,000
Cash Outflows												
Wages	£3,280	£3,280	£3,300	£3,330	£3,330	£3,330	£3,330	£3,330	£3,500	£3,500	£3,500	£3,500
Start-Up costs	£7,201	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Stock purchases	£1,440	£4,380	£17,800	£17,500	£18,500	£17,500	£4,500	£4,500	£4,500	£4,500	£4,500	£4,500
Telephone/Internet	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45
Utility Bills	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65
Advertising	£60	£60	£60	£60	£60	£60	£70	£70	£70	£70	£70	£70
Loan repayment	£185	£185	£185	£185	£185	£185	£185	£185	£185	£185	£185	£185
Business Rates	£152	£152	£152	£152	£152	£152	£152	£152	£152	£152	£152	£152
Rent	£833	£833	£833	£833	£833	£833	£833	£833	£833	£833	£833	£833
Drawings	£2,000	£2,000	£4,000	£4,000	£5,000	£6,000	£6,000	£10,000	£10,000	£14,000	£14,000	£11,000
TOTAL	£15,261	£11,000	£26,440	£26,170	£28,170	£28,170	£15,180	£19,180	£19,350	£23,350	£23,350	£20,350
Opening Balance	£0	£8,339	£4,539	£99	-£71	-£1,241	-£4,211	-£1,391	£1,029	£17,679	£12,329	£3,379
Net Cash Flow	£8,339	-£3,800	-£4,440	-£170	-£1,170	-£2,970	£2,820	£2,420	£16,650	-£5,350	-£8,950	-£2,350
Closing Balance	£8,339	£4,539	£99	-£71	-£1,241	-£4,211	-£1,391	£1,029	£17,679	£12,329	£3,379	£1,029

A **FORMULA** is an expression which calculates the value of a cell.

In this example the Cash Inflows Total for April, would be to add the value of Sales, Loans and any savings for the month. Excel would calculate this using the formula =B3+B4+B5

A **FUNCTION** is a predefined formula that performs calculations using specific values in a particular order. The **SUM** function adds values. You can add individual values, cell references or ranges or a mix of all three.

Excel includes many common **functions** that can be used to quickly find the SUM AVERAGE, COUNT, MAXIMUM value, and MINIMUM value for a range of cells.

A **Cash Flow Forecast** is to show how much cash a business receives into the bank account for a period of 12 months. The cash from Sales and from the Loans that the business has borrowed from the bank make up the cash inflows.

It also shows the cash outflows, so anything that business has to pay for example bills it has to pay those each month and we can total them for each month to calculate the total cash outflows.

The cash flow forecast also shows the opening balance in the bank account at the start of each month. We then work out the net cash flow so the inflows minus the outflows each month and we then can work out the closing balance by adding those two items together.
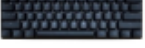
CONDITIONAL FORMATTING

is a feature in many spreadsheet applications that allows you to apply specific **formatting** to cells that meet certain criteria. It is most often used as colour-based **formatting** to highlight, emphasize, or differentiate among data and information stored in a spreadsheet.

Computing—How Computers Work   Name_____

Device	What is it?	Input, Output or Storage ?	What it is used for ?
	Monitor	Output	Displaying images and text.
	Mouse	Input	Navigating and selecting items on a screen.
	Optical Storage: Blu-ray, CD or DVD	Storage	Storing files e.g. documents, movies and audio.
	USB Flash Memory Stick	Storage	Backing up or transferring data from one computer to another.
	Keyboard	Input	Typing.
	Printer	Output	Printing.
	Hard Disk Drive	Storage	Storing applications and files.
	Speakers	Output	Audio.
	Scanner	Input	Scanning to store digitally/electronically.
	Sim Card	Storage	Storing mobile phone contacts.
	Webcam	Input	Using video calling over the Internet.
	Headphones	Output	Listening to audio

Key Terms

Hardware	Objects that you can touch, like a keyboard, mouse, monitor etc.
Application Software	You cannot 'touch' software. Software refers to the programs that run on a computer. Examples of software: Windows, MS Word, MS Excel, Publisher etc.
Input Devices	An **input device** is computer hardware, which is used to enter data for processing. Examples of **input devices** include keyboard, mouse, image scanner, digital cameras and joysticks.
Output Devices	An **output device** is any hardware **device** used to send data from a computer to another **device** or user. Typical examples of **output devices** are monitors, projectors, headphones, speakers and printers.
Storage Devices	A piece of computer equipment on which information can be stored.

9

Key terms

CPU	The central processing unit, is a large chip inside the computer. It is known as the brains of the computer.
RAM (Random Access Memory)	RAM is both readable and writable. You can add, change and delete data stored in RAM. It is volatile. When the computer is switched off, all the data stored in RAM is lost. It is fast to read/write.
ROM (Read only Memory)	ROM is read-only. ROM is non-volatile memory, which means it does not need power to keep the data inside it.
Hard Drive	The hard drive (sometimes called the hard disk) is the main storage device in your computer. If you have files and folders on your computer, they are stored on the hard drive. The operating system is also stored on the hard drive.
BIOS (basic input output system)	Contains all the basic code for controlling your computer hardware (such as keyboards, mice, monitors and hard drives).

The CPU Key Terms

The Control Unit	The control unit runs the show. It understands the instructions and tells the other components what each instruction needs from them. It manages the instructions and controls the other components.
Arithmetic logic unit (ALU)	The ALU is the calculator of the CPU. It handles mathematical and logical operations that are required as part of an instruction. It manages calculations and logic.
Clock	The CPU contains an internal clock that is used to regulate the number of cycles carried out per second and synchronise the other components. It manages the cycles per second.
Registers	These are very small, very fast memory locations located inside the CPU. There are a few key registers. **(MAR)** Memory address register stores memory addresses used when searching for data in RAM. **(MDR)** Memory data register Stores the data when fetched from memory. **Current instruction register (CIR)** Holds the binary representation of the instruction to be executed. **Program counter (PC)** This register counts up as each instruction is executed, keeping track of how many instructions are in a program. **Accumulator (Acc)** Stores important data being used in calculations.

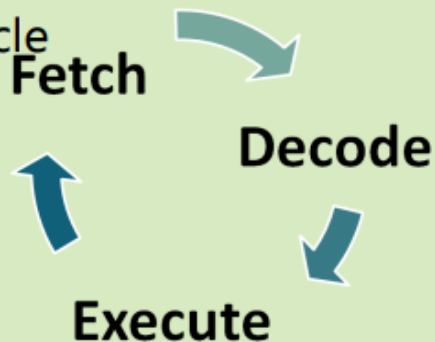## The Fetch-Decode-Execute Cycle

FETCH

Instructions are loaded into memory (RAM) before the processor starts running the program. Each instruction is the fetched from memory (in order) and put into the appropriate registers. The control unit can then access the instruction for the next stages.
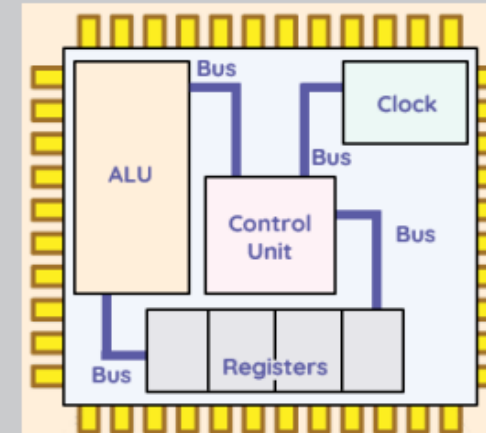
DECODE

The binary representation of an instruction needs to be decoded before it can be run. This is the process the control unit uses to work out what the other components need to do. Each processor will have slightly different encodings for instructions.

EXECUTE

Once the instruction is understood, the instruction will be executed. The control unit will tell the other components what they need to do in order for the instruction to work.
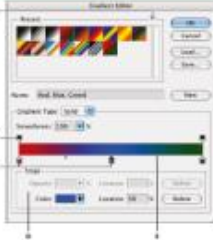
Fetch

Decode

Execute

Computing—Graphics: Photopea Name_____

Tool	What it is used for ?
Image Editing/Graphics Software	Software programs that allow you to manipulate digital images.
Brush	A brush tool is one of the **basic tools found in graphic design and editing applications**. It is a part of the painting tool set which may also include pencil tools, pen tools, fill colour and many others. It allows the user to paint on a picture or photograph with the selected colour.
Spot Healing Brush	The spot healing brush can be used to clone areas from an image and blend the pixels from the sampled area seamlessly with the target area. The basic principle is that the texture from the sample area is blended with the colour and luminosity surrounding wherever you paint.
Clone	The clone tool is used in digital image editing to replace information for one part of a picture with information from another part. In other image editing software, its equivalent is sometimes called a rubber stamp tool or a clone brush.
Text	This *tool* allows *text* to be typed onto the current layer using the Primary colour. The *Text* Controls in the *Tool* Bar can be used to change the font.
Gradient	The Gradient tool **creates a gradual blend between multiple colours**. You can choose from pre-set gradient fills or create your own. Note: You cannot use the Gradient tool with bitmap or indexed-colour images. To fill part of the image, select the desired area.
Adjust white balance levels	White balance is **the adjustment of a digital photograph to make its colours appear more realistic**
Face Remixing	**Mix faces together in different combinations**.
Adjustment Layers	An adjustment layer **applies colour and tonal adjustments to your image without permanently changing pixel values**.
File Formats for digital Graphics	PSD, TIFF, PNG, JPEG, GIF
Best file type for printing	TIFF
Best file type for online use	PNG/JPEG

Computing — Python

Key Terms

Python	A programming language
Programming Code	The process of writing computer programs . The instructions that you write to program a computer
Sequence	Parts of the code that run in order
Selection	Selects pathways through the code dependent on conditions
Iteration	Code is repeated (looped) while something is true or for a number of times
Algorithm	A set of rules / instructions
Variable	A value that can be changed (speed, lives, score) Function Inbuilt code that performs a specific task
String	A sequence of characters that can include letters, numbers, symbols
Integer	Whole numbers, no decimal point
Boolean	Can only output the result of True or False
Float	Decimal Numbers
Concatenation	Operation that joins two string together ('Tall + 'Giraffe")
Data Type	Format in how data is stored (float, integer, string)

Indentation	Moves code inwards to show it belongs to the same subsection of code
Syntax	Spelling and grammar of a programming language so that the computer can understand it
Comparison Operator	When comparing data, a comparison operator is used to test the condition
Compiler	Collects every line of code together and checks for errors before executing

Python to English

```
Fname = "Paul"
Sname = "Smith"
print(Fname+Sname)
```

print('Hello')	Prints Hello on the screen
input(")	Inputs a value into the computer
x=input(")	Inputs a value and stores it into the variable x
if name == 'Fred':	'Checks to see if the variable 'name' has a value that is equal to 'Fred'
else:	The other option if the conditions for an if statement are not met (e.g.. name = 'Bob' when it should be Fred)

Arithmetic Operators

+	Addition
—	Subtraction
*	Multiplication
/	Division
//	Integer division
%	Remainder
**	Exponent

Comparative Operators

==	Equal to
!=	Not equal to
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

Variables/WHILE LOOPS

Variable

can hold a value that can be changed. We can assign a value to a variable by using an equals(=) sign. We can add 2 strings together using +, this is known as concatenating. We can get a keyboard input from the user using the input function. This example will ask the user for their name and store it in the "name" variable. We can then print that value. Combine the inputs with other Strings to print a clear message.

```
name = input("What is your name")
print("Your name is "+name)
```

A **while loop** will keep repeating code until a certain condition is met. For example repeat until lives do not equal 0.

Computing –Privacy and Surveillance

How could data be lost? What could criminals use the data for?

Hacking	Blackmail
Accidental deletion	Steal identities
Overwriting of files	Make online purchases
Power cuts	
Spilled liquids	
Hard drive worn out	
Natural disaster e.g. weather	
Fire	

Category	Explanation
Legal	Technology provides opportunities to criminals. To help protect people, their data, and their work, several laws have been introduced in the UK.
Environmental	The effect that technology has on the world around us
Cultural	How have society and the ways that we interact been impacted?
Ethical	Considerations about right and wrong, morality and power
Privacy	Once data is put on a computer, it can be easily copied or shared. In some cases, people have a right to choice in this matter.

Computers and the Law

Data Protection Act (DPA) 2018

Computer Misuse Act 1990

Copyright, Designs and Patents Act 1988

Freedom of Information Act 2000

Legal

Data Protection Act

Purpose: To control the way that data is handled and to give legal rights to people who have information stored about them.

Who is it for?: We are all "data subjects". That just means that we have data stored about us and have the right to have the data looked after properly and have the right to see that data. This is called the 'right of subject access'.

Who makes sure that companies stick to DPA? **Data Controller (DC) and Information Commissioner's Office (ICO)**

The DC is the person who is responsible for ensuring that the organisation stays within the principles of the Data Protection Act.

The ICO makes sure that the companies keep to the rules, and fines those that don't, sometimes heavily.

The principles of the Data Protection Act 2018

1. Personal data must be fairly and lawfully processed
2. Personal data must be obtained for specified, explicit and legitimate purposes
3. Personal data muse be adequate, relevant and not excessive
4. Personal data must be accurate and up-to-date
5. Personal data must not be kept longer than necessary
6. Personal data must be handled in a way that ensures security

Computing –Privacy and Surveillance

Stakeholder

Stakeholders are groups or individuals who will be affected by or can change the way the technology is used.

Right to be forgotten

The right to be forgotten (part of GDPR) means that an individual can request that an organisation erases all their personal data. This right only applies in certain circumstances, e.g. the personal data is no longer necessary for the purpose for which an organisation originally collected or processed it.

Copyright, Designs and Patents Act 1988

The Copyright, Designs and Patents Act 1988 exists to protect people's creations. When a person creates something, they own it. E.g.

A picture, photograph, recording of music, television programme, film, text (book, article or report), algorithm (but only once the source code has been created)

When is it legal to copy, publish, distribute, or sell copyrighted material?

- When you are the copyright holder
- When you have the copyright holder's permission
- When the copyright holder has chosen to give up their copyright

Open Source V's Proprietary Software

Proprietary software cannot be copied/altered (without permission of the copyright owner)

Open source software can be modified (provided it remains open source)

Proprietary software is distributed only as a completed program; the source code is not available

Open source software is distributed with its source code

Creative Commons (CC)

A creative commons licence is one of several public copyright licenses that enable the free distribution of an otherwise copyrighted work.

The work must not be used for commercial purposes and should not be changed

Use appropriately licensed material.

Legal use of other people's work

Credit the creators of the material.

Credit the source/website of the material.

Freedom of Information Act 2000

The Freedom of Information Act was introduced to give **any** member of the public the right to access any information recorded by public sector organisations. These organisations include: Schools, councils, government departments, health trusts and hospitals, libraries and museums.
Requests must be made in writing, either by letter or by email. The organisation then has 20 working days to provide the information.
When doesn't the organisation have to respond?
It would cost too much or take too much staff time to deal with the request
The request is vexatious (designed to create annoyance)
The request repeats a previous request from the same person
In addition, requests cannot be responded to if they contravene data protection or GDPR
Why is the Freedom of Information Act important? It promotes social justice. 'Social justice' refers to creating an equal society where everyone is treated fairly and has equal opportunities. Public organisations act on everyone's behalf and spend money that belongs to everyone; therefore, everyone has a right to know how that organisation operates, and what they spend public funds on.

Computing –Privacy and Surveillance

Computer Misuse Act 1990

The Computer Misuse Act (1990) and its amendments were created so that unauthorised access to computers and crimes committed using a computer could be prosecuted. The act is

PRINCIPLES	LEGAL ACTIONS
Unauthorised access to digital/computer material. This means a person asking a computer to perform any function with the intent of accessing anything on the computer for which they do not have permission, and for which they know they do not have permission.	Punishable by up to two years in prison and a £5,000 fine.
Unauthorised access to digital/computer material with intent to commit or facilitate the commission of further offences. This means a person gaining access to a computer without permission in order to commit another crime or to enable someone else to commit a crime.	Punishable by up to five years in prison and an unlimited fine determined by the damage caused and the severity of the crime.
Unauthorised acts with intent to impair, or with recklessness as to impairing, the operation of a computer. This means a person intentionally impairing the operation of any computer or program, or intentionally preventing access to any data or program on any computer. This includes creating or supplying materials that could be used to carry out this offence.	Punishable by a prison sentence of up to ten years and an unlimited fine, but if the act puts life at risk or endangers national security, the sentence may be extended to life imprisonment.

Cultural impact of technology

'Culture' means 'relating to the ideas, customs, and social behaviour of a society', i.e. 'how we do things around here'. 'Impact' means 'to have an effect on something'.
- Impact on daily lives
- Digital Divide
- Globalisation

E-Waste

Use of non-recyclable materials, Depletion of rare chemical elements, Harmful effect of pollution caused by disposal and recycling to environment and health of recyclers through exposure to toxins.

Downtime

'Downtime' describes situations where an organisation loses some or all of its IT systems for a period of time. This could be for any number of accidental or deliberate reasons, including:

- Planned maintenance and system upgrades
- Power or ISP failure
- Cyberattacks
- Human error
- Natural disasters

Artificial Intelligence (AI)

Artificial intelligence is technology that enables a computer to think or act in a more 'human' way.

Algorithm

An algorithm is a set of instructions that describes how to get something done.

The Digital Divide

The digital divide is the division that exists between people who have access to and can use technology, and people who don't have access or cannot use it:

People who live in rural areas-Slower internet speeds, delayed access to repairs

People who live in developing countries

People in low-income households

People with poor computer skills

Elderly people

Some people who have disabilities

The Investigatory Powers Act 2016

This act sets out rules on the use of investigatory powers by the police and security and intelligence agencies. Phone companies and internet service providers are required to keep copies of users' emails and browsing histories for 12 months. It also gives the police and security services the authority to access computers and phones to search for data.

ANALYSE

- To look at
- To examine in detail to explain and interpret

1. Investigate
2. Explore
3. Extract

- In Year 9 you will be Analysing a Designer and a Design Period.
- You will analyse both Zaha Hadid and Art Deco
- Your analysis will help you when you Design.

Zaha Hadid

Iraqi-British architect and designer, recognised as a major figure in architecture

In search of an alternative to traditional architectural drawing, and influenced by Suprematism (Geometric shapes, deconstructivism-broken up shapes).

Hadid adopted painting as a design tool and abstraction (to pull away and detach) as an investigation.

She was described by some as the "Queen of Curves", who "liberated architectural geometry, giving it a whole new expressive identity".

Her major works include the London Aquatics Centre for the 2012 Olympics, Vitra fire station, Evelyn Grace Academy and the Guangzhou Opera House,

Hadid was the first woman to receive the Pritzker Architecture Prize in 244. She received the UK's most prestigious architectural award, the Stirling Prize, in 2010 and 2011. In 2012, she was made a Dame for services to architecture, and in February 2016.

Design in the style of Zaha Hadid

Daring sharp angles
Zig Zag

Swooping curves
Flowing waves
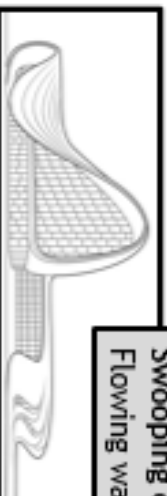
Shapes linked location
Waves like the water

1st; Doodle thoughts
Initial ideas are quickly sketched

2nd Card Model design ideas
Make parts to scale

3rd Develop into a final idea
- S.C.A.M.P.E.R;
  (Substitute, Change, Alter, Move, Place, Reduce)
- Prototypes

4th Make
Cut, Shape and finish into a working product

PRODUCT DESIGN

To put together

Practical activity

1. Construct
2. Join

In Year 9 we will be making your own design idea.

You will use tools to make the parts.

It will be made from either Plywood or Jelutong.

Key Concepts

Quality	• The grade of excellence • How good something is / looks • How well it is made
Identical	• You will cut 2 identical parts • The 2 parts could have equal measurements to allow to be accurate
Precision	• Measure and cut within an acceptable range, to allow parts to fit together without gaps.
Engineering Tolerance	• Across all aspects of making, I have no errors.

Select Material
Ply or Jelutong

- Ply is manufactured board, it has layers of 3mm, flat surface, easy to cut but can splinter
- Jelutong is a hardwood. These properties such as the low density, straight grain and fine texture mean it is easy to work.

Select and Use the correct equipment

1. Measuring: Pre-Made Templates; to draw around the outside shape, Steel Ruler; working in millimetres to measure the correct length cuts
2. Marking Out: Marking gauge; to score across the wood surface, Scribe to scratch the surface , Centre punch; to mark drill hole.
3. Wasting (Removal of materials);
   - Cutting: Fret Saw, Coping Saw, Tenon Saw, Pad Saw, Junior Hack saw
   - Drilling: Hand drill, Pillar Drill
   - Shaping: Rasp, Files (various profiles)

Joining parts together to create a self-supporting product

Slot Construction

Notch Construction / Tab and Slot

Dowel Joint

Surface Decoration

Pyrography
Applying heat to create the textured pattern

Dremel
Removing materials to create the textured pattern

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TEXTILES ANALYSE

- In Year 9 you will be Analysing the ART DECO Design Period.
- Your analysis will help you when you Design.

Art Deco

What is Art Deco?
The predominant decorative art style of the 1920s and 1930s, characterized by precise and precise geometric shapes and strong colour. Used mainly in household objects and in architecture.

Design History
It emerged in France in the 1920s and took its name from the Exposition Internationale des Arts Décoratifs et Industriels Modernes, held in Paris in 1925. It was most popular between the years 1925 - 1939

Inspiration
It was an eclectic style that drew on tradition and the mechanised modern world. It celebrated both hand crafted and machine products, exclusive art and mass-produced products in affordable materials.

Background Information
Art Deco is said to be influenced by the world at the time, skyscrapers began to spread across Americas skylines, cruise-liners and planes were becoming more accessible to the average person and Tutankhamun's tomb had just been discovered. All these influences filtered into the elegant design of Art Deco products. The rise of mass production in this era made it possible for all to style their home and selves in this fashion.

Key Designers: Eileen Gray

Key Features or Patterns: geometry features heavily, influenced by transport and skyscraper shapes. Chrome, satin, animal products (e.g. furs, tortoise shell), high gloss woods.

Colours: Silver, black and chrome, gold, bronze, mother of pearl.

Line Styles: geometric, circles, arcs and curves, mathematically drawn. Straight lines. Streamlined shapes

Design in the ART DECO style

Geometric shapes: Art Deco designs often feature Geometric shapes, such as circles, squares and triangles.

Practical activity

1. Construct
2. Join

MAKING

In Year 9 we will be making your own design idea.

You will use tools to make the parts.

It will be made from either Plywood or Jelutong.

Key Concepts

Quality	• The grade of excellence • How good something is / looks • How well it is made
Identical	• You will cut 2 identical parts • The 2 parts could have equal measurements to allow the for-slot construction to be accurate
Engineering Tolerance	• Measure and cut within an acceptable range, to allow parts to fit together without gaps.
Precision	• Across all aspects of making, I have no errors.

Select Material
Ply or Jelutong

• Ply is manufactured board, it has layers of 3mm, flat surface, easy to cut but can splinter

• Jelutong is a hardwood. These properties such as the low density, straight grain and fine texture mean it is easy to work.

Select and Use the correct equipment

1. Measuring: Pre-Made Templates; to draw around the outside shape, Steel Ruler; working in millimeters to measure the correct length cuts
2. Marking Out: Marking gauge; to score across the wood surface, Scribe to scratch the surface, Centre punch; to mark drill hole.
3. Wasting (Removal of materials);
   • Cutting: Fret Saw, Coping Saw, Tenon Saw, Pad Saw, Junior Hack saw
   • Drilling: Hand drill, Pillar Drill
   • Shaping: Rasp, Files (various profiles)

Joining parts together to create a self-supporting product

Slot Construction

Notch Construction / Tab and Slot

Dowel Joint

Surface Decoration

Pyrography
Applying heat to create the textured pattern

Dremel
Removing materials to create the textured pattern

Year 9 Knowledge Organiser – Real Life

PERFORMANCE SKILLS

FACIAL EXPRESSIONS

GESTURES

BODY LANGUAGE

GESTURES

MOVEMENT

MOVEMENT

Real Life

You will learn about the technique of Mantle of the Expert and apply this to performance work based around a criminal investigation, exploring the different job roles involved within this area.

Tasks for this topic:

- Exploring how you use voice to suit a professional environment
- Using voice to sound like an expert in a particular field when you are not
- Creating performance work based on a process, following the procedure of the justice system.

Performance Techniques	
Mantel of the Expert	Taking on the role of an expert
Realism	Representational of the real world
Articulation	The formation of clear and distinct sounds in speech
Adapt	To make or become suitable

Understanding Poetry

Stanza

A group of lines in a poem.

Rhyme Scheme

The pattern / order of rhyming words in a poem. This example follows ABA

Flag by John Agard

What's that fluttering in a breeze?
It's just a piece of cloth
that brings a nation to its knees.

What's that unfurling from a pole?
It's just a piece of cloth
that makes the guts of men grow bold.

What's that rising over a tent?
It's just a piece of cloth
that dares the coward to relent.

What's that flying across a field?
It's just a piece of cloth
that will outlive the blood you bleed.

How can I possess such a cloth?
Just ask for a flag, my friend.
Then blind your conscience to the end.

Enjambment

The continuation of a sentence onto the next line without punctuation.

Caesura

A break or pause in a line of poetry shown by punctuation.

Rhyming Couplet

A rhyming pair of successive lines (lines that follow on after each other).

Understanding Articles

Headline

Introduction: A Hellish World

Subheading

Main Body: our reality

Paragraph One

Subheading

Main Body: our reality

Paragraph Two

Subheading

Main Body: our reality

Paragraph Three

Conclusion: A Heavenly World

YEAR 9 SPRING TERM KNOWLEDGE ORGANISER:
OUR WORLD
POETRY AND NON-FICTION

Universal Themes

Love

Suffering

Good vs Evil

Big Ideas

Demonisation
The act or process of portraying something / someone as wicked and threatening.

Identity
The fact of being who a person is / what they are made up of (background, culture, family).

Inclusivity
Providing equal access to opportunities and resources for everyone, especially those who might be excluded.

Representation
The description of someone / a group of people in a particular way.

Tolerance
Willing to accept other people's behaviour and opinions even if you do not agree with them.

Social Division
Divisions in society associated with social groupings, often causing conflict, inequality and disadvantage.

Context – We must understand the influences of the world we live in when examining texts.

Critical Theory:

A critical theory is a lens that scholars use when reading a text.

E.G. Marxism and capitalism, displacement, the panopticon, nihilism, otherness, critical race theory, heteronormativity and critical gender theory.

Otherness

Otherness is a critical theory that investigates the presentation of 'others' ('them') by the dominant group ('us') to perpetuate (continue) a single story about 'others'/ 'them'.

'Otherness' uses real or imagined differences as a tool to stigmatise, discriminate and stereotype.

Critical Race Theory & Eurocentrism

Critical race theory investigates how people are portrayed and represented based on their race (physical characteristics) and ethnicity (where people are from).

Eurocentrism explores how Europe has shaped world history from a European perspective, often meaning that it is biased and excludes a wider world view.

Pronunciation: euro / sen / tr / ism

Heteronormativity

A worldview that promotes heterosexuality as the normal, natural and preferred sexual orientation. It assumes that everyone is heterosexual unless they state otherwise.

Pronunciation: hetero / norm / a / tiv / ity

Critical Gender Theory

Critical gender theory examines how people are portrayed and represented based on the characteristics that are stereotypically associated with their gender (masculinity and femininity).

YEAR 9 SPRING TERM KNOWLEDGE ORGANISER: OUR WORLD
TECHNICAL ACCURACY & KEY DEVICES

'WORLD' – OUR PERSUASIVE WRITING STRUCTURE

Part	Key Features
INTRODUCTION: A HELLISH WORLD	• Your introduction begins your persuasive piece • Use an 'imagine' sentence to put your reader in a hellish world • Include pathos: emotive language and rhetorical questions • Finish with your opinion on the topic
MAIN BODY: OUR REALITY	• Your main paragraphs should include a problem, example and a solution • You are aiming for three main paragraphs • Begin with a topic sentence to establish the problem • Include ethos, logos and pathos • Use real-world examples • End with a concluding sentence that gives a solution
CONCLUSION: A HEAVENLY WORLD	• Your conclusion ends your persuasive piece • Use a 'now imagine' sentence to put your reader into a heavenly world • Include pathos • Finish with your final opinion on the topic

Device / Feature

Imagery
Metaphors, similes, symbols

Pathetic fallacy
Giving human emotions to something non-human (usually nature)

Metaphor
Describing something by stating it is something else

You Are My Sunshine

Personification
Giving living qualities to something non-human

Simile
Comparing something to something else: 'as', 'like'

YOU'RE AS SWEET AS Honey

Hyperbole
Exaggeration

Symbolism
Objects, colours, sounds, places

Direct Address
Speaking directly to the audience / reader 'you'

Sensory language
Five senses

Juxtaposition
Contrasting ideas / images

Aristotle's Rhetoric Triad

Ethos
Trust, credibility, experience

Logos
Logic, proof and reason

Pathos
Empathy and values

Common Homophones

There / Their / They're

Your / You're

Its / It's

Which / Witch

Word Classes

Adjective	Adverb	Preposition	Pronoun	Noun	Verb
Describes a noun or pronoun. Blue / young / powerful	How, when or where something happens. Furiously / yesterday / here	Where something is; the time, direction or cause of something. On / under / above	Words that replace nouns or noun phrases. She / he / they	Person, place, thing, idea or state of being. Manchester / cat / love	An action or state of being. Jump / write / be

In Year 9 we will be making dishes you can cook at home.

You will use equipment to make.

It will be made following a recipe.

To put together

Practical activity

1. Assemble
2. Mix
3. Stir

Knife Skills and Techniques

Bridge Method: Make a bridge with your fingers and thumb, place the knife underneath and cut downwards, repeat to cut ingredients to size.

Claw Method: Make a claw with your hand by curling your fingers and then place the knife near your claw sliding it away from the knife as you slice each piece

Hygiene rules in the food room

Wash your hands with anti-bacterial soap

Wear a clean apron

Tie hair up

Make sure your nails are clean and nail varnish

Cover cuts and sores with a blue plaster

Clean work surfaces with sanitiser

Use clean dishcloths and tea towels

Make sure all equipment has been cleaned thoroughly in hot soapy water

short—no

Egg Experiments

Sensory Properties off eggs:

1. Garnish- eggs can be cooked and used as a garnish to products (e.g. sliced hard boiled egg)

2. Glazing- beaten whole egg or yolk can be used to create a shiny glaze on pastry. Egg white and sugar creates a crystallised glaze

Nutritional Properties of eggs:

Eggs are a valuable source of high biological value protein, B group vitamins, calcium and phosphorous.

Coagulation

During the cooking process, coagulation happens as the proteins SET.

Raw and partially cooked eggs can contain Salmonella bacteria. Therefore it is advised that eggs should be fully cooked if they are to be eaten by babies, the elderly, pregnant women or frail people.

Pasta making

How is flour turned into pasta?

The type of flour used to make pasta is called durum (wheat) flour. It is sometimes called doppo zero (which means double zero) flour. This fine flour is suitable for making pasta because the durum wheat is high in protein and holds its shape during cooking, making it strong dough.

Basic pasta dough is made from flour, salt, eggs, oil and water. A pasta machine is usually used to make different shapes and varieties of dried pasta, for example:

* farfalle – bow ties
* penne – tubes
* fusilli – twists

Using a pasta machine

In Year 8 we will be evaluating your cooking skills

You will evaluate the nutritional information linked to your dishes

To review

To look back at

1. Discuss
2. Compare
3. Judge

Sensory characteristics

- Ingredients are selected for their nutrition, functional and sensory characteristics, as well as provenance and seasonality

Using our senses

A range of senses are used when eating food:

- sight;
- smell;
- taste;
- hearing;
- touch.

A combination of these senses helps to evaluate a food

Sight

The size, shape, colour, temperature and surface texture all play an important part in helping to determine your first reaction to a food. Often if a food does not look appetising, then you will not eat it.

Smell (odour)

The nose detects volatile aromas released from food. An odour may be described by association with a particular food, e.g. herby, cheesy, fishy. The intensity can also be recorded.

Smell and taste

Smell (odour) and taste work together to produce flavour. This is the reason why people with a blocked nose find it difficult to determine the flavours of foods.

Umami

Umami is a savoury taste, often known as the fifth taste. It is a subtle taste and blends well with other tastes. Umami has its own distinct savoury taste, often associated with ripe tomatoes and cheese.

Taste

The tongue can detect five basic tastes:

- bitter;
- salt;
- sour;
- sweet;
- umami.

Touch

Texture can be assessed through touch. When food is placed in the mouth, the surface of the tongue and other sensitive skin reacts to the feel of the surface of the food. The sensation is also known as mouth-feel.

Hearing/sound

The sounds of food being prepared, cooked, served and eaten all help to influence our preferences. The sound of eating food can alter our perception of how fresh a food is (e.g. crunchy carrots).

The olfactory system

The olfactory system is the sensory system used for olfaction, or the sense of smell.

Other factors

Other factors also experience the way we feel about food. These include:

- food previously eaten;
- hunger and satiety;
- mood;
- where you eat, e.g. home, canteen, picnic;
- beliefs and values, e.g. religion, culture and tradition;
- social aspects e.g. special occasions, events.

Taste receptors

Our tongues are covered with taste buds, which are designed to sense chemicals in the mouth.

Taste receptors

Sensitivity to all tastes is distributed across the whole tongue (and indeed other regions of the mouth where there are taste buds), but some areas are more responsive to certain tastes than others.

Heat exchange/transfer

Cooking requires heat energy to be transferred from the heat source, e.g. the cooker hob, to the food. This is called heat transfer or heat exchange. There are three ways that heat is transferred to the food. They are:

- conduction – direct contact with food on a surface, e.g. stir-frying;
- convection – currents of hot air or hot liquid transfer the heat energy to the food, e.g. baking;
- radiation – energy in the form of rays, e.g. grilling.

Many methods of cooking use a combination of these. The amount of heat and cooking time will vary according to the type of food being cooked and the method being used.

Selecting ingredients

Ingredients are chosen for a number of reasons, such as:

- to add flavour, colour or texture;
- to provide a particular function, e.g. to thicken;
- to provide nutrients or change the nutritional profile of a dish, e.g. to increase fibre;
- to extend the shelf life, e.g. vinegar for pickling or chemical preservatives;
- cost and availability, e.g. fruit in season;
- to satisfy a need to buy food with a certain provenance, e.g. Red Tractor.

CLIMATE CHANGE

WHAT IS CLIMATE?

- Climate is the average weather in a place. It tells us what the weather is usually like.
- Climate is worked out by taking weather measurements over a long period of time (usually 30 years) and then calculating the average i.e. of temperature and rainfall.
- Weather is what you get on a day-to-day basis!

WHAT IS CLIMATE CHANGE?

A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels!

NATURAL CAUSES OF CLIMATE CHANGE

ORBITAL THEORY

- The Earth's orbit is sometimes circular, and sometimes more of an ellipse (oval)
- The Earth's axis tilts. Sometimes it is more upright, and sometimes more on its side.
- The Earth's axis wobbles, like a spinning top about to fall over.

The Three Ways Earth's Orbit Changes — Eccentricity, Precession, Tilt

SUNSPOT THEORY

- The Sun's output is not constant. Cycles have been detected that reduce or increase the amount of solar energy.
- Temperatures are greatest when there are plenty of sunspots – because it means other areas of the Sun are working even harder!
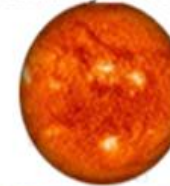
THE ERUPTION THEORY

- Volcanic eruptions produce ash and sulphur dioxide gas. This is circulated globally by high level winds.
- The blanket of ash and gas will stop some sunlight reaching the Earth'.
- Instead, the sunlight is reflected off the ash/gas, back into space.
- This cools the planet and lowers the average temperature.
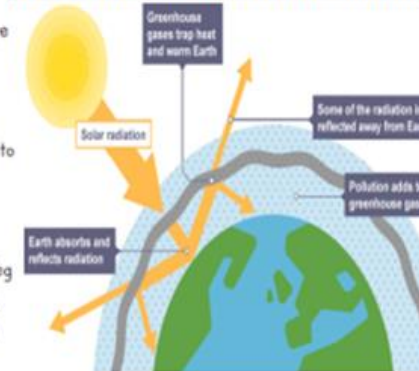
Impacts of Climate Change in the Maldives

- In the Maldives the coral in the reefs are bleaching. This is due to the algae in them disappearing, taking the bright vivid colours away, leaving it white.
- Corals are found where there is salty, shallow, clear water that is over 18 degrees Celsius.
- Corals are considered the 'rainforests of the sea' meaning that they support very high biodiversity.
- Climate change is causing the sea temperature to rise meaning more bleaching events and areas of coral are dying.
- This will have huge impacts on coastal flooding as the coral reefs protect the islands from destructive waves but also will hit tourism on the islands too as many people visit to see the coral reefs.

HUMAN CAUSES OF CLIMATE CHANGE

THE GREENHOUSE EFFECCT

- A natural function of the Earth's atmosphere is to keep in some of the heat that is lost from the Earth.
- The atmosphere allows the heat from the Sun (short-wave radiation) to pass through to heat the Earth's surface.
- The Earth's surface then gives off heat (long-wave radiation).
- This heat is trapped by **greenhouse gases** (eg methane, carbon dioxide and nitrous oxide), which radiate the heat back towards Earth.
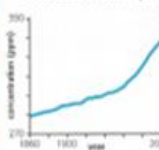- This process heats up the Earth.

- Carbon dioxide (CO2) is a greenhouse gas
- As technology has developed and the population on earth has increased, the amount of CO2 has increased since 1860.
- Data clearly shows that although temperatures have fluctuated since 1960, the general pattern is that global temperatures have increased as CO2 levels rise
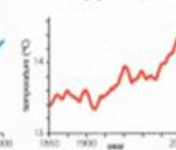
HUMAN FACTORS INCREASING WARMING

- Burning fossil fuels, eg coal, gas and oil – these release carbon dioxide into the atmosphere.
- Deforestation - trees absorb carbon dioxide during photosynthesis. If they are cut down, there will be higher amounts of carbon dioxide in the atmosphere.
- Dumping waste in landfill - when the waste decomposes it produces methane.
- Agriculture - agricultural practices lead to the release of nitrogen oxides into the atmosphere.

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Impacts of climate change in Bangladesh

- Bangladesh is a low-lying country in Asia. To the south is the Indian Ocean and to the North are the Himalayan Mountains.
- As it is low lying it is very vulnerable to sea level rise and coastal flooding is becoming much more frequent making land unusable due to the high salt content of the sea.
- In addition, as winters become warmer more ice is melting in the Himalayas making river flooding events more common also.
- This is causing people to become internally displaced in Bangladesh. When people are displaced from their homes in Bangladesh, they are affected both economically and socially. They lose their houses and must re-start their lives in another place.

Impacts of climate change in the UK

- We are now seeing weather patterns change in the UK as we have recorded 10 of the hottest summers on record within the last 15 years. Including the hottest temperature ever recorded in July 2022.
- Scientists believe that extreme weather events in the UK will become more common these include increased floods in Winter and Spring and increased droughts and heatwaves in summer.
- As global sea levels continue to rise, we are also likely to experience more coastal erosion.
- Impacts of these events could be water shortages due to heatwaves and droughts.
- More insurance claims due to flooding
- Changes to crop yields for farmers as plants can be seriously affected by both too much rain in Spring and not enough rain in summer.
- Although warmer and drier summers is likely to attract more tourists.

My carbon footprint- What can I do to try and reduce it?

Factors that add to a person's carbon footprint include their diet (how far their food has travelled- this is referred to as food miles). Also, how much energy they use within their household e.g. to heat their homes. If fossil fuels are being used instead of renewable energy sources they will be adding to their carbon footprint. In addition, the transport people use will also add to this, cars emit C02 into the atmosphere.

Food Miles- *Food miles are the distance food is transported from the time of its making until it reaches the consumer.*

Everyone can do something to help reduce global greenhouse emissions the most common being reduce, refuse and recycling of our waste. In addition, being more energy conscious making sure we try to reduce our consumption by turning off lights, walking or cycling instead of getting lifts where appropriate and being conscious of the products we buy.

MITIGATING TO CLIMATE CHANGE

Mitigation means to reduce or prevent the effects of something from happening.

Mitigation strategies include:

- o **ALTERNATIVE ENERGY** - using alternative energy such as solar, wind or tidal can reduce the use of fossil fuels. This will reduce the amount of carbon dioxide released into the atmosphere.
- o **CARBON CAPTURE** - this is the removal of carbon dioxide from waste gases from power stations and then storing it in old oil and gas fields or coal mines underground. This reduces the amount of emissions into the atmosphere.
- o **PLANTING TREES** - encouraging **afforestation**, means that there will be more trees to absorb the carbon dioxide in the atmosphere during the process of photosynthesis.
- o **INTERNATIONAL AGREEMENTS** - in 2005 the Kyoto Protocol became international law. The countries that signed up to the treaty pledged to reduce their carbon emissions by 5 per cent. However, this ran out in 2012 and its overall impact has been small. The US refused to join and major developing countries like China and India were not required to make any reductions.

Year 9 - Manchester

Key Terms	
Urban area	Towns and cities
Settlement	A place where people live e.g. town or city
Migration	When people move somewhere new to live and work
Industrial Revolution	When machines changed people's way of life as well as how we make things.
Deindustrialisation	When a country moves away from manufacturing to service industries. Factories shut.
Land Use	How the land of an area is used. For example housing, shops, offices, recreation.
Inequality	The state of not being equal. May refer to rights or opportunities.
Regeneration	To renew an area aiming to fix social and economic problems.
Demographics	The characteristics of an areas population. E.g. gender, age, religion, wealth, education level
Deprivation	The state of being without something important. E.g. adequate housing or education
sustainability	Using the Earth's resources in a way that ensures they will be available for future generations

- Manchester is in the **northwest of England**. Manchester's population has increased by 9.7% since 2011 to **551,900**. Manchester has a relatively young population, with almost 62,000 20-24-year-olds living there (linked to the university population.)

- Manchester was a reasonably small town until the early 1800s, when it grew rapidly. The unplanned growth was due to the growth of textile manufacturing during the Industrial Revolution.

Why is Manchester special?
- **Economic importance:** Manchester accounts for 10% of all employment in the UK.
- **Education importance:** Manchester has two major universities
- **Cultural importance:** Manchester is known as the music capital of the UK. It is home to a range of venues for music as well as many bands such as The Stone Roses, The 1975, Oasis, The Happy Mondays and The Smiths originated in Manchester. Manchester is also famous for sports with two hugely successful football teams plus Lancashire Cricket Club and Manchester Thunder (netball).
- **Historical importance:** Manchester became known as 'Cottonopolis' as the textile industry became its primary source of income. During the industrial revolution which led to world firsts like a ship canal and the worlds first passenger railway line.

Urban Change in Manchester
Manchester is a city that is changing. After a period of deindustrialisation, regeneration of the city is now taking place at pace!If you visit the city centre you will see lots of cranes building sky scrapers and shiny new glass buildings as the government and companies continue to invest in the city!
Manchester is a very different place to what it was in the 1990s when it was tired and run down. See the image below for how the skyline has changed...

Manchester's population
Manchester Metropolitan Borough, 000s

Rapid growth as people moved to the city for work in the mills and factories

New growth due to investment and increasing student numbers who choose to stay.

Population stabilised during the periods between the wars

Population decline due to deindustrialisation (see key terms) no jobs meant people moved away.

Source: ONS
© FT

Who lives in Manchester? Demographics..

- Demographics are the study of statistics that tell us about the population and people in a place.
- For example did you know that the population of Greater Manchester has increased by 200,000 since 2011. That is an increase of 7.5%. Manchester's population is increasing as the number of jobs available increase.
- In addition the average wage in Greater Manchester is £35,000 whereas the UK average is £38,200. Conversely the average is 38 whereas the average age for the whole of the UK is 40. This is because many students choose to stay in Manchester after university. We can use demographics to help us understand places and also learn about potential opportunities and challenges.
- The **choropleth map below shows us the average of people in different parts of Greater Manchester.** The ellipsis shows the city centre and the university quarter which is predominantly younger than the rural to urban fringe. We can ascertain that many younger people live in the flats in the city whereas older people tend to live on the edge of the towns near more rural areas.
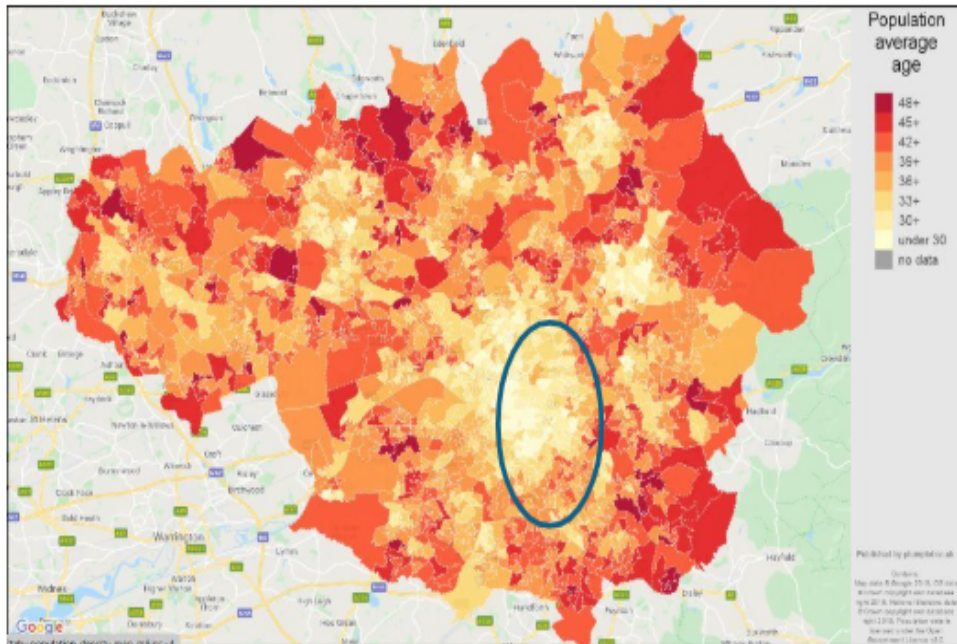
What challenges does Manchester face?

Social deprivation is the degree to which an individual or an area is deprived of services, decent housing, adequate income and local employment. This is a problem because ideally, we would like everyone to have access to the same level of services and therefore the same life chances. The map below (red square) shows that there is very little deprivation in Westhoughton but people in Bolton can experience more social deprivation. This can affect education, health services, access to public transport and also jobs that pay higher wages.

Mapping Deprivation in Greater Manchester

- Neighbourhoods in most deprived 1% in England
- Neighbourhoods in most deprived 10% in England
- All other neighbourhoods

What will it take for Manchester to thrive?

Manchester needs to become a sustainable city. What does this mean?
Sustainable urban strategies include:

- Providing a range of employment (jobs)
- Conserving cultural, historical and environmental sites and buildings
- Minimising the use of greenfield sites by using brownfield sites instead.
- Increasing provision and use of public transport
- Providing Green Spaces to reduce flooding, improve air quality and people's moods.
- Recycling and re-using waste
- Reducing reliance on fossil fuels
- Increasing use of renewable energy
- Minimising water waste entering local rivers and seas

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Year 9 Knowledge Organiser: The Holocaust

What do I need to know?
- ✓ Why Jews have been persecuted throughout history?
- ✓ What were the key stages in the persecution of the Jews in Nazi Germany?

KEY VOCABULARY

Antisemitism	Racism against Jewish people including prejudice, discrimination and hostile behaviour.	**Persecution**	Unfair or cruel treatment over a period of time- usually because of race or religion.
Scapegoat	A person or group who is blamed for the mistakes of others.	**Citizenship**	Being a citizen of a country and so having rights e.g. to vote and to be protected by the law.

Why have Jews been persecuted throughout history?

People often think that the persecution of the Jews was unique to Nazi Germany but this is not true. In fact, Jews have been persecuted throughout history and in many different countries.

Why?
- ❑ The Christian Church portrayed Jews as the killers of Christ.
- ❑ Many Jews appeared to be wealthy and people envied them. It was often said that rich Jews were part of a conspiracy to take over the world.
- ❑ Governments often made Jews scapegoats for problems in their country.

Where?
- ❑ In France in 1348, Jews were burned to death for causing the Black Death.
- ❑ In England in 1290, more than 250 Jews were hanged because they were seen as greedy and having more money than other English people.
- ❑ In Russia in the 1800s, Jews were blamed for the failure of the harvest because a few rich Jewish farmers have not suffered as much as others.
- ❑ In the 1920s, Jews were blamed for Germany losing the First World War.

Stage 1: The passing of anti-Jewish laws

As soon as the Nazis came to power in 1933, they started to pass laws that were intended to make the lives of Jewish people more difficult.

The 1935 Nuremberg Laws included:

- ❑ Law for the Protection of German Blood and Honour: Marriages between Jews and German citizens are forbidden.
- ❑ Reich Citizenship Law: No Jew can be a German citizen.

Soon these laws were extended to include all aspects of Jewish life:

- ❑ September 1937 - Large numbers of Jewish businesses were confiscated.
- ❑ 1938 - Aryan and non-Aryan children are forbidden to play together.
- ❑ June 1938 - Jewish doctors, lawyers and dentists were forbidden to treat Aryans.
- ❑ August 1938 - Jews forced to use Jewish forenames, Israel for men and Sara for women.
- ❑ October 1938 - Jews had to have a red letter 'J' stamped on their passports.
- ❑ April 1939 - Jews can be evicted from their homes without reason being given or without notice.
- ❑ September 1939 - Jews are no longer allowed to leave their homes after 8pm.

August 1934
Hitler becomes dictator of Germany

September 1935
The Nuremberg Laws are passed

KEY VOCABULARY

Ghetto	Walled off areas of cities where Jews were forced to live.	**Holocaust by Bullets**	The mass murder of 2 million Jews by the SS Einsatzgruppen (special action groups).
Final Solution	The plan to kill all the Jews in Europe.	**Dehumanise**	To take away human qualities by treating someone in an inhuman way.

Stage 2: Kristallnacht (The Night of Broken Glass), November 1938

A Jewish man went to the Germany embassy in Paris, where he shot and killed a Nazi official. Kristallnacht was the punishment of all Jews for his actions.

- ❑ Josef Goebbels organised anti-Jewish demonstrations in Germany which involved attacks on Jewish property.
- ❑ 7,500 Jewish homes, businesses and synagogues were destroyed.
- ❑ Over 100 Jews were killed and 26,000 healthy male Jews were round up and sent to concentration camps.
- ❑ Jews were fined 1 billion Reichmarks for the damage caused on Kristallnacht.
- ❑ This event signaled a major change in the persecution of the Jews. Up to this point the persecution had been largely non-violent.

Stage 3: Life in the ghettoes

Ghettoes or 'Jewish districts' were set up in Poland to isolate Jews from the main population. These were walled off areas of cities where Jews were forced to live. Any Jews caught leaving could be shot. The Warsaw ghetto was the largest.

- ❑ It was run by the Judenrat, a Jewish council who carried out Nazi orders.
- ❑ It had a population of over 400,000 people living in a very small area – the ghetto was overcrowded.
- ❑ On average 7 – 8 people shared a room.
- ❑ Houses were unheated and dirty water entered the water supply leading to diseases such as typhus and typhoid fever.
- ❑ There was a limited food supply – each person received a bowl of watery soup and 300g of black bread twice a day.
- ❑ Dead bodies were often seen in the streets until they were removed by garbage men.
- ❑ Over 92,000 Jews died due to starvation, disease and cold.

Stage 5: The Final Solution
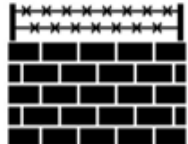
The Final Solution was the plan to kill all Jews in Europe.

- ❑ Altogether 6 extermination camps were built in Poland including Auschwitz- Birkenau and Sobibor.
- ❑ Each camp had purpose built gas chambers. Each of the gas chambers at Auschwitz-Birkenau could hold up to 2,000 Jews and the gas, Zyklon B, could kill them within 20 minutes.
- ❑ Jews were transported to the camps in cattle trucks. Upon arrival a selection took place. The elderly, the disabled and young children were sent straight to the gas chambers.
- ❑ Those who were not sent straight to the gas chambers were kept alive to be used as slave labour. They would be worked to death in a process known as 'destruction through work'.

Stage 4: The Holocaust by Bullets

In June 1941, Germany invaded Russia and occupied a lot of Russian land. Russia was home to many Jews; they now came under Nazi control.

- ❑ The German army was followed by the SS Einsatzgruppe. This was a special force, whose job was to murder all the Jews – men, women and children – it could find.
- ❑ Whole communities were rounded up and shot into mass graves.
- ❑ Altogether, it murdered over two million people.

November 1938 Kristallnacht	→	October 1939 The start of the move to ghettoes	→	June 1941 The start of the Holocaust by bullets	→	January 1942 The Wannsee Conference is held to plan the Final Solution
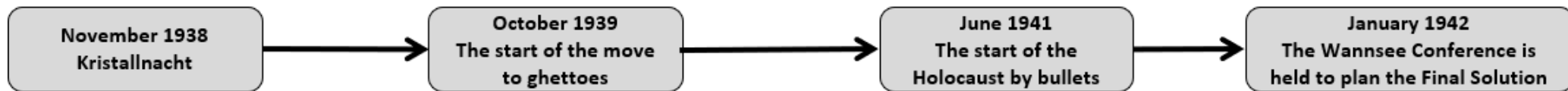
KEY VOCABULARY

Resistance	An act of opposing or fighting back against something or someone.
Liberation	The act of freeing people from a place of imprisonment or oppression.
Perpetrator	Someone who carries out and is responsible for a crime or immoral act.
Collaborator	Someone who works with people they know are committing crimes or immoral acts.
Bystander	Someone who is present when a crime or immoral act of committed but does not take part.

How did Jewish people resist?

Jewish people resisted the Nazis in various ways, some violent and some non-violent. Examp[les] include:

- In April-May 1943, Jews in the Warsaw ghetto rose in armed revolt. The Germans were a[ble to stop?] the major fighting within a few days, but it took them nearly a month before they were able to completely pacify the ghetto.
- In October 1943, over 300 Jewish prisoners escaped from Sobibor extermination camp. This was the most successful uprising in any of the camps.
- The Bielski partisans rescued Jews from extermination and fought against the Nazis. They blew up railway lines and attacked supply lines.
- Some Jews published underground newspapers and leaflets. They continued to observe Jewish religious holidays.
- The Frank family went into hiding in the annex above the factory owned by Otto Frank. Here they hid for two years, helped by who brought them food and other things that they would need.

How were the camps liberated?

Auschwitz was liberated on January 27, 1945 by Soviet troops.

In the weeks beforehand the Nazis began to destroy evidence of their crimes.

- Most Auschwitz prisoners had been forced to march westward in what would become known as death marches.
- They murdered most of the Jews who had worked in Auschwitz's gas chambers and crematoria, then destroyed most of the gas chambers.
- The Germans ordered prisoners to tear down many buildings and destroyed many of their meticulous records of camp life.
- They also took steps to move much of the material they had looted from the Jews they murdered elsewhere.
- When they entered the camp, Soviet soldiers found over six thousand emaciated prisoners alive. These prisoners greeted the soldiers as their liberators.

Who was to blame for the Holocaust?

The answer to this question seems to be simple: Hitler. The truth is more complicated.

Perpetrators – people who carried out the Holocaust
- Heinrich Himmler - he was head of the SS. The SS were the people who ran the death camps.
- Irma Grese – she was a guard at Belsen concentration camp. She shot Jews and helped select victims for the gas chambers.

Collaborators – people who worked with the Nazis
- Jaqueline Hering - she and her husband owned a furniture company who would buy Jewish hair from the camps to stuff their products with.
- Charlotta Elias - Polish woman who told SS officers about a Jewish family hiding in the woods close to her home.

Bystanders – those people who witnessed it but did not take part
- A German man – he watched from the other side of the street, as a Jewish shopkeeper cleared up the smashed glass from his shop window after Kristallnacht.
- The Allies (British, French and American armies) – they knew about the transportation of Jews to Auschwitz but doing nothing to stop them.

April – May 1943 Uprising in the Warsaw ghetto	→	October 1943 Escape from Sobibor	→	January 1945 Liberation of Auschwitz
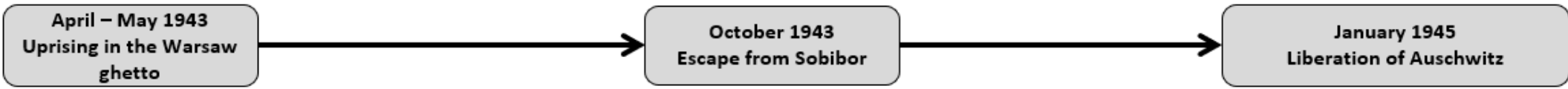
Weather in Paris

À Paris – In Paris
au printemps – in the spring
en été – in summer
en automne – in autumn
en hiver – in winter
quand – when
s' (si) – if
il fait beau – it's nice weather
il fait mauvais – it's bad weather
il fait chaud – it's hot
il fait froid – it's cold
il y a du soleil – it's sunny
il y a du vent – it's windy
il pleut – it rains
il neige – it snows

Activities I might do

je fais du vélo – I do cycling
je fais de la danse – I do danse
je fais de l'équitation – I do horse-riding
je fais de la natation – I do swimming
je chante – I sing
j'écoute de la musique – I listen to music
je joue de la guitare – I play the guitar
je joue au foot – I play football
je prends des photos – I take photos

Daily routine

je me prépare – I get ready
je me réveille – I wake up
je me lève – I get up
je me douche – I have a shower
je me lave – I wash
je me lave les dents – I clean my teeth
je me brosse les dents – I brush my teeth
je me brosse les cheveux – I brush my hair
je m'habille – I get dressed
je me parfume – I put perfume/aftershave on
je me maquille – I put makeup on
je me regarde dans la glace
– I look at myself in the mirror
je me couche – I go to bed
Je ne me parfume pas
I don't put on perfume/aftershave
Je ne me maquille pas
I don't put makeup on
Demain je vais m'habiller
– Tomorrow I am going get dressed
Quand je serai plus grand(e),
je vais me parfumer
– When I am older, I
am going to put on perfume/aftershave

What I like to do

J'aime… - I like…
faire du vélo – to do cycling
faire de la danse
– to do danse
faire de l'équitation
– to do horse-riding
faire de la natation
– to do swimming
chanter – to sing
écouter de la musique
– to listen to music
jouer de la guitare
– to play the guitar
jouer au foot
– to play football
prendre des photos
– to take photos

At the café

une glace au chocolat
A chocolate ice-cream
un croque-monsieur
a ham and cheese toastie
une crêpe
A pancake
un chocolat chaud
a hot chocolate
un café
a coffee
un thé (au lait)
A tea (with milk)

Where I like to go

J'aime aller… - I like to go…
…au café - …to the café
…au centre commercial
- … to the shopping centre
…au centre de loisirs
- …to the leisure centre
…au château - …to the castle
…au cinéma - …to the cinema
…au marché - …to the market
…au parc - …to the park
…au restaurant
- …to the restaurant
…au stade - …to the stadium
…à la piscine
- …to the swimming pool
…aux magasins - …to the shops
…aux musées - …to the museums
…au concert - …to the concert

Future holidays

À l'avenir / Dans le futur
- In the future
je vais aller…
- I am going to go…
Je voudrais aller…
- I would like to go

Year 9 Topic 2 Part 2: Les vacances - Holidays

Key ideas

Daily routine
Weather in Paris
Describing where I like to go
Describing what I like to do
Future holidays
At the cafe

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To The

à = to

au – masc. (à + le = au)
à la – fem. (à + la = à la)
à l' – vowel sound (à + l' = à l')
aux – plural (à + les = aux)

Definite Article – The
le – masculine
la – feminine
les – plural
l' – starts with a vowel sound

Partitive Article – Some
du – masc. (de + le = du)
de la – fem. (de + la = de la)
des – plural (de + les = des)
de l' – vowel sound (de + l' = de l')

When using verb phrases to give opinions and refer to the future, the second verb in the phrase, must be in its infinitive form.

In English, the infinitive has "to" in front of the verb.

In French, the verb will end in –er, ir or –re.

For example:
J'aime aller au concert
– I like to go to the concert
Je voudrais faire de la danse
– I would like to do dance

Using French in real life!
Vous désirez, monsieur/madame?
What would you like, sir/madam?
Je voudrais... / J'aimerais...
I would like...
S'il vous plait
please (formal)
C'est combien?
How much is it?
Merci beaucoup
Thank you very much

Using a range of language improves the quality of our speaking and writing and allows us to access more challenging texts!

Time phrases
Il y a deux mois – Two months ago
Samedi matin – Saturday morning
Dimanche après-midi – Sunday afternoon
Jeudi soir – Thursday evening
Tout d'abord / D'abord - Firstly
Puis - Then
Ensuite - Next
Après - After
Enfin / Finalement – Finally
Normalement – Normally
D'habitude – Usually
Quelquefois - Sometimes

Reflexive verbs
Se préparer – to get ready
Se lever – to get up
S'habiller – to get dressed

Se disputer – to argue
Je me dispute – I argue
Tu te disputes – You argue (sing. / informal)
Il se dispute – He argues
Elle se dispute – She argues
On se dispute – We argue
Nous nous disputons – We argue
Vous vous disputez – You argue (plural / polite)
Ils se disputent – They argue (m / m+f)
Elles se disputent – They argue (f)

Opinions
À mon avis – In my opinion
Je pense que – I think that
Je crois que – I believe that
Je dirais que – I would say that
Selon moi – According to me

C'est – it is
Je trouve ça – I find it/that
Ce sera – it will be
Ce serait – It would be

très – very
assez – quite
vraiment – truly
réellement – really
un peu – a bit
peu – little
trop – too
extrêmement – extremely
tellement – so

ennuyeux / barbant – boring
nul – rubbish
assez bien – quite good
amusant / marrant – funny
passionnant – exciting
intéressant – interesting
génial – great
pratique – practical
cher – expensive

Where did you go?
¿Adónde fuiste?
– Where did you go?
El año pasado – Last year
El verano pasado – Last summer
fui a Inglaterra – I went to England
fui al Reino Unido
– I went to the United Kingdom
fui a España – I went to Spain
fui a Europe – I went to Europe
fui a las Islas Canarias
– I went to the Canary Islands
fui a las Islas Baleares
– I went to the Balearic Islands
fui a América Latina / Latinoamérica
– I went to Latin America

Who with?
¿Con quién fuiste? – Who did you go with?
Fui con mi familia – I went with my family
Fui con mis padres – I went with my parents
Fui con mis amigos – I went with my friends
Fui con mi clase – I went with my class

What did you do?
¿ Qué hiciste en tus vacaciones de verano?
– What did you do during your summer holidays?
El último día de tus vacaciones, ¿qué hiciste?
– On the last day of your holidays, what did you do?
bailé – I dances
compré una camiseta – I bought a t-shirt
descansé en la playa – I relaxed on the beach
mandé mensajes / SMS – I wrote messages / SMS
monté en bicicleta – I rode my bike
monté a caballo – I rode a horse
nadé en el mar – I swam in the sea
hice natación – I did swimming
saqué fotos – I took photos
colgué fotos – I posted photos
subí fotos – I uploaded photos
tomé el sol – I sunbathed
visité monumentos – I visited monuments
bebí una limonada - I drank a lemonade
comí paella – I ate paella
conocí a un chico guapo – I met a good-looking boy
conocí a una chica guapa – I met a good-looking girl
escribí mensajes / SMS – I wrote messages / SMS
salí con mi hermano / hermana
– I went out with my brother / sister
vi un castillo interesante – I saw an interesting castle
no bailé – I didn't dance

How did you get there?
¿Cómo fuiste? – How did you get there?
Fui en autobús – I went by bus
Fui en autocar – I went by coach
Fui en coche – I went by car
Fui en tren – I went by train
Fui en barco – I went by boat

Past opinions
¿Cómo te fue? – How was it for you?
¿Cómo te fue?
Me gustó
Me encantó
No me gusto
porque
hizo buen tiempo
comí algo malo y vomité
llovió
perdí mi pasaporte
perdí mi móvil

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Opinion openers
En mi opinión – In my opinion
Creo que – I believe that
Pienso que – I think that
Diría que – I would say that

Opinions
¡Qué fantástico! – How fantastic!
¡Qué interesante! – How interesting!
¡Qué divertido! – How fun!
¡Qué aburrido! – Ho boring!
¡Qué guay!
¡Qué rico!
¡Qué suerte!
¡Qué mal!
Fue fantástico – It was fantastic
Fue interesante – It was interesting
Fue divertido – It was fun
Fue aburrido –It was boring
Fue emocionante – It was exciting

The preterite (past) tense

Ir – to go

Fui – I went
Fuiste – You went (singular / informal)
Fue – He/She went
Fuimos – We went
Fuisteis – You went (plural / polite)
Fueron – They went

Ser – to be

Fui – I was
Fuiste – You was (singular / informal)
Fue – He/She/It was
Fuimos – We were
Fuisteis – you were (plural / polite)
Fueron – They were

Intensifiers
muy – very
bastante – quite
un poco – a bit
poco – few/little
realmente – really
demasiado – too
simplemente – simply
especialmente – especially
totalmente – totally
completamente – completely
absolutamente – absolutely

Time expressions
allí – there
el primer día – on the first day
el último día – on the last day
otro día – another day
por la mañana – in the morning
por la tarde – in the afternoon
primero – first
luego – then
más tarde – later
después – afterwards

Using a range of language improves the quality of our speaking and writing and allows us to access more challenging texts!

Ratio

Component Knowledge

- Write a ratio
- Simplify a ratio
- Sharing into a ratio given the total
- Sharing into a ratio given a part of the ratio.
- Sharing into a ratio given the difference between two parts

Key Vocabulary

Ratio	The relative sizes of two or more values.
Simplify	Reducing the ratio into a simpler form by dividing by a common factor.
Share	To split into equal parts or groups.
Equivalent	Equal in amount or value but looks different.
Part	This is the numeric value An equal amount that, when combined with others creates the whole.

Write a ratio

When writing a ratio, the order is important. Each number must be separated by a colon ":"
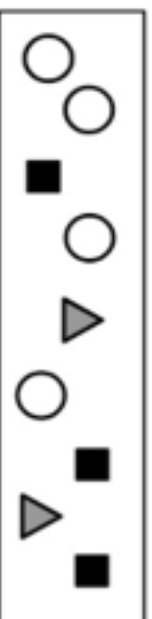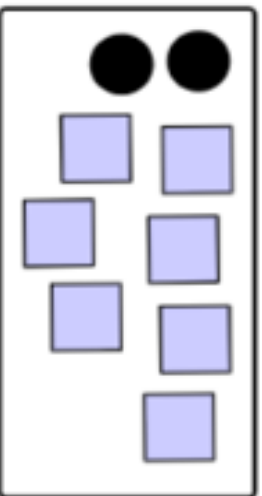
Ratio of circles to squares is 2 : 7

This means that for every 2 circles there are 7 squares

Ratio of circles to triangles to squares is 4 : 2 : 3

This means that for every 4 circles there are 2 triangles and 3 squares

Simplify ratios

To simplify a ratio, divide all numbers in the ratio by the same amount. You may need to do it in stages.

÷3 9 : 3 ÷3
3 : 1

÷4 8 : 12 : 4 ÷4
÷4
2 : 3 : 1

÷10 200:150 ÷10
÷5 20:15 ÷5
4:3

Sharing into a ratio given a total

Josh and Jack have £36.
They divided it in the ratio 4 : 5
How much did they each get?

Draw a **Bar Model** to calculate how much **one part** is worth.

Josh | 4 | 4 | 4 | 4 | £16
Jack | 4 | 4 | 4 | 4 | 4 | £20
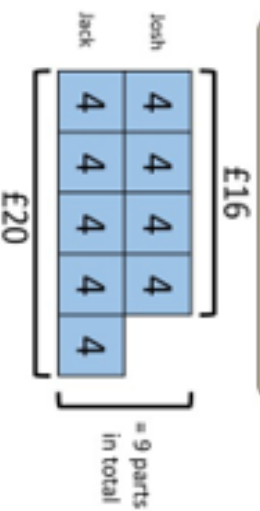
= 9 parts in total

£36 ÷ 9 = £4 per part
Josh - £4 × 4 = £16
Jack - £4 × 5 = £20

Sharing into a ratio given a part

Jess and John shared some marbles in the ratio 3 : 4 John got 12 marbles.
How many marbles were there in total?

> Draw a **Bar Model** to calculate how much **one part** is worth.

Jess | 3 | 3 | 3 |
John | 3 | 3 | 3 | 3 |

9

12

4 parts = 12 marbles
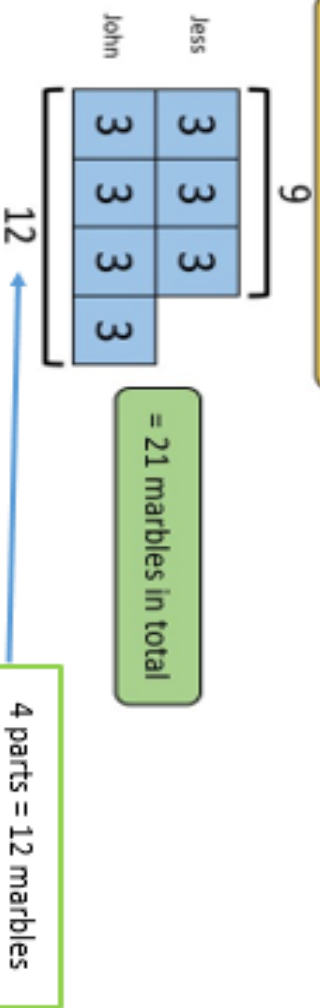
$12 \div 4 = 3$ marbles per part

3 marbles per part × 7 parts = 21 marbles in total

= 21 marbles in total

Sharing into a ratio given the difference between two parts

Anna and Andy shared some sweets in the ratio **3 : 7**. Andy got **16 more** than Anna.
How many sweets were there in total?

> Draw a **Bar Model** to calculate how much **one part** is worth.

Anna | 4 | 4 | 4 |
Andy | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

12

16

28

4 parts = 16 sweets more
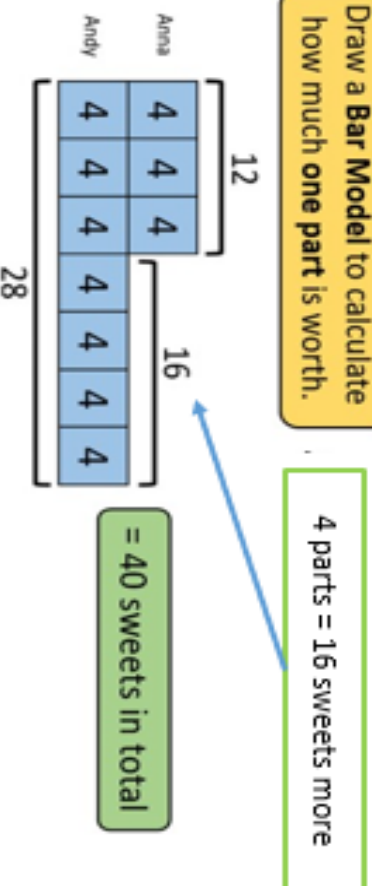
$16 \div 4 = 4$ sweets per part

4 sweets per part × 10 parts = 40 sweets in total

= 40 sweets in total

Online clips

M885, M801, M525, M543

Measures

Key Vocabulary

Convert	To change from one unit to another such as from centimetres to millimetres, or litres to millilitres, etc.
Unit	A quantity used as a standard of measurement
Length	The measurement of something from end to end
Capacity	The maximum amount that something can contain
Mass	The weight of an object
Time	A numerical quantity that represents the duration between two events.
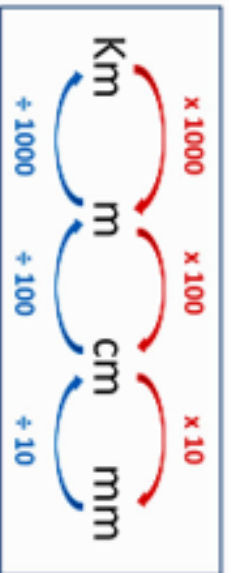
Component Knowledge

- Convert between units of length
- Convert between units of capacity
- Convert between units of mass
- Convert between units of time

Units of length

Km   ×1000   m   ×100   cm   ×10   mm

Km   ÷1000   m   ÷100   cm   ÷10   mm

5km = ? m   Need to × 1000   5 × 1000 = 5000m ✓

120cm = ? m   Need to ÷ 100   120 ÷ 100 = 1.2m ✓

Units of capacity

L   ×100   cL   ×10   mL

L   ÷100   cL   ÷10   mL

5L = ? cL   Need to × 100   5 × 100 = 500 cL

750 mL = ? cL   Need to ÷ 10   750 ÷ 10 = 75 cL

Units of mass

tonne   ×1000   kg   ×1000   g   ×1000   mg

tonne   ÷1000   kg   ÷1000   g   ÷1000   mg

Mass conversions use 1000's, and usually create fairly large results.

1.6 tonne = ? kg   Need to × 1000   1.6 × 1000 = 1600 kg ✓

Units of time

days   ×24   hours   ×60   minutes   ×60   seconds

days   ÷24   hours   ÷60   minutes   ÷60   seconds

2 mins = ? secs   need to × 60   2 × 60 = 120 secs

96 hrs = ? days   need to ÷ 24   96 ÷ 24 = 4 days
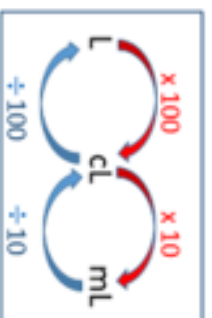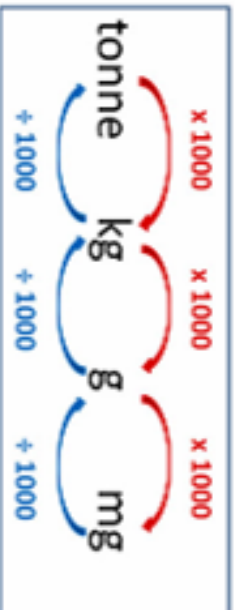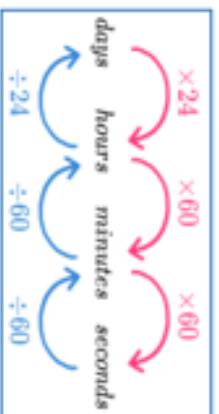
Online clips

M772, M761, M530, M774, M627, M515

Area of 2-D shapes

Key Vocabulary

Area	The <u>amount</u> of squared units that fit inside a shape
Dimension	The lengths of the sides of the shape
Unit of measure	This can be length (cm, mm, m) or area (cm^2, mm^2)
Compound shape	A 2-D shape composed of key 2-D shapes
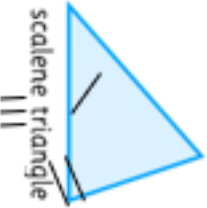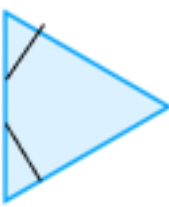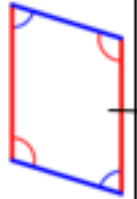
Component Knowledge

- Identify the relevant dimensions
- Identify the correct formula for area
- Express the answer in the correct units

2-D Shapes

scalene triangle |||	isosceles triangle	equilateral triangle
square	rectangle	parallelogram

Area Formulae

$A = l \times w$

$A = ½ (b \times h)$

Examples

$Area = 2 \times 4 = 8m^2$

(2 m by 4 m)

$Area = \frac{1}{2}(10 \times 12)$

$= 60cm^2$

(12 cm, 10 cm)
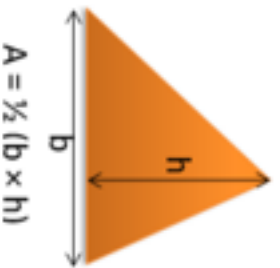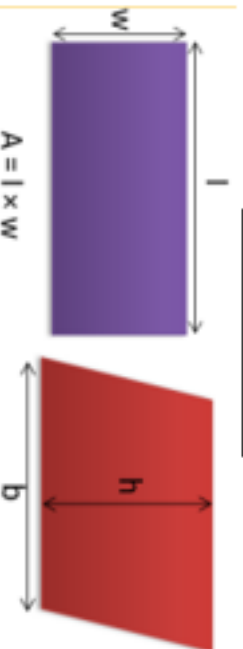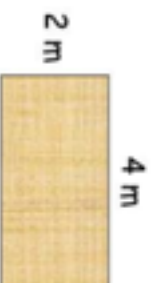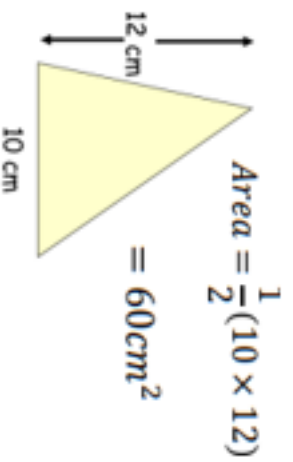
Compound shape example

$$Area = (5 \times 3) + (2 \times 5)$$
$$= 25cm^2$$

You must determine any missing dimensions,
e.g. 8 − 3 = 5cm

5 cm

Further examples

Questions – Find the area.

1)

12 cm
8 cm

2)

16 cm
14 cm

3)

15cm
6cm
7cm
9cm
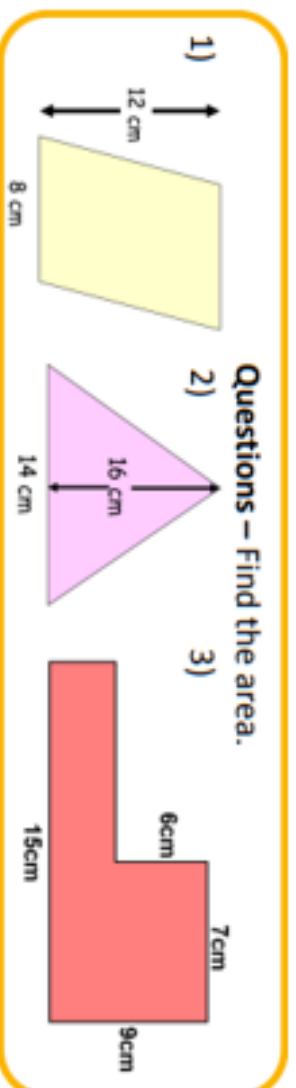
1)

Area = 12 × 8 = 96cm²

2)

$$Area = \frac{14 \times 16}{2} = 112cm^2$$

3)

$$Area = (6 \times 7) + (15 \times 3) = 87cm^2$$

Online clips

M900, M390, M291, M610, M269, M996

Compound shape example

8cm

5cm

3cm

2cm

5 cm

You must determine any missing dimensions,

e.g. 8 − 3 = 5cm

$$Area = (5 \times 3) + (2 \times 5)$$
$$= 25cm^2$$

Further examples

Questions – Find the area.

1)

12 cm

8 cm

$$Area = 12 \times 8 = 96cm^2$$

2)

16 cm

14 cm

$$Area = \frac{14 \times 16}{2} = 112cm^2$$

3)

6cm

7cm

15cm

9cm

$$Area = (6 \times 7) + (15 \times 3) = 87cm^2$$

---

1)

2)

3)

Online clips

M900, M390, M291, M610, M269, M996

Proportion

Component Knowledge

- Find the value of 1 item (unitary method)
- Use proportion to work out which item is best value for money
- Use proportion to solve problems involving exchange rates
- Use proportion to solve problems involving recipes

Key Vocabulary

Proportion	2 or more quantities that change by a related amount in the same ratio.
Exchange rate	The amount of money in a different currency that your currency will buy or sell for.
Best buy	Comparing the cost of 2 or more items and interpreting the values.
Unitary method	Finding the value of 1 item.
Direct proportion	A relationship between two quantities such that as one increases, the other increase (or as one decrease, the other decreases) at the same rate.

Unitary method

Finding the value of a single unit and then finding the necessary value by multiplying the single unit value.

Example

If 3 ice creams cost £3.75, how much does 1 ice cream cost?

£3.75
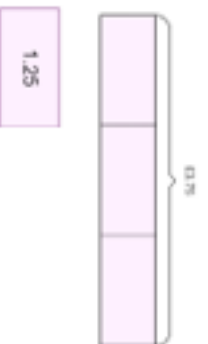
£3.75 ÷ 3 = £1.25.   1 ice cream costs £1.25.

How much do 5 ice creams cost? (use the cost of 1 ice cream to find this)

1.25	1.25	1.25	1.25	1.25

£6.25

£1.25 × 5 = £6.25.   5 ice creams cost £6.25.

Best buys

Find the unit cost by dividing the price by the quantity (unitary method). The lowest number is the best value.

Shop A
4 cans for £1.20
£1.20 ÷ 4
1 can is £0.30
Or 30p

Shop B
3 cans for 93p
£0.93 ÷ 3
1 can is £0.31
Or 31p

Cost per item

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

Shop A is the better value.

You can also compare using multiples. Multiply both amounts until you have the same number of items (12 in this case). Then compare the costs to find the lowest.

Eat Fresh
4 for 46p
46p × 3 = £1.38 for 12

Max-Mart
6 for 75p
75p × 2 = £1.50 for 12

✓ CHEAPEST

43

Exchange rates

$$\times 1.5$$

$$£1 = \$1.50$$

$$\div 1.5$$

For every £1, you can buy $1.50 US dollars. This is the price of one pound, expressed in dollars i.e. the £/$ exchange rate

Examples

Change £200 into US dollars.   £200 × $1.5 = $300

Change $75 into British Pounds $75 ÷ $1.5 = £50

To change an amount of £ into $, multiply by 1.50

To change an amount of $ into £, divide by 1.50

A watch costs £45 in Manchester. The same watch costs $68 in New York. In which place is the watch cheaper?

£45 × $1.5 = $67.50.   (Both in US dollars)

(Both prices need to be in the same currency)

The watch is cheaper in Manchester.

Recipes

Non calculator

A recipe to make **10 cupcakes**:

| 100 g of butter |
| 100 g of sugar |
| 100 g of flour |
| 2 eggs |

How much of each ingredient is needed to make **15 cupcakes**?

To get from 10 to 15, divide by 2 and then multiply by 3

$\div 2$

| 50 g of butter |
| 50 g of sugar |
| 50 g of flour |
| 1 egg |

5 cupcakes:

$\times 3$

| 150 g of butter |
| 150 g of sugar |
| 150 g of flour |
| 3 eggs |

15 cupcakes:

Calculator

A recipe to make **10 cupcakes**:

| 100 g of butter |
| 100 g of sugar |
| 100 g of flour |
| 2 eggs |

How much of each ingredient is needed to make **15 cupcakes**?

Use the unitary method, divide by 10 to find how much 1 cupcake needs and then multiply by 15

1 cupcake:

| 10g of butter |
| 10g of sugar |
| 10g of flour |
| 0.2 of an egg |

15 cupcakes:

| 150 g of butter |
| 150 g of sugar |
| 150 g of flour |
| 3 eggs |

Online clips

M478, M681, U610

Terms and notations of 3D shapes

Key Vocabulary

3 dimensional	Having 3 dimensions such as height, width and depth
Vertices	Where edges meet to form a point
Edge	Where two faces meet
Face	A flat surface
Net	A flat 2D shape which can be folder to create a 3D shape
Prism	A type of 3D shape with two ends that are the same shape and size.

Component Knowledge

- Be able to name 3D shapes
- Identify edges, faces and vertices on 3D shapes
- Recognise nets of 3D shapes

Names of 3D shapes

Sphere

Cone

Cube

Square Based Pyramid

Cuboid

Tetrahedron

Cylinder

Triangular Prism

Hexagonal Prism
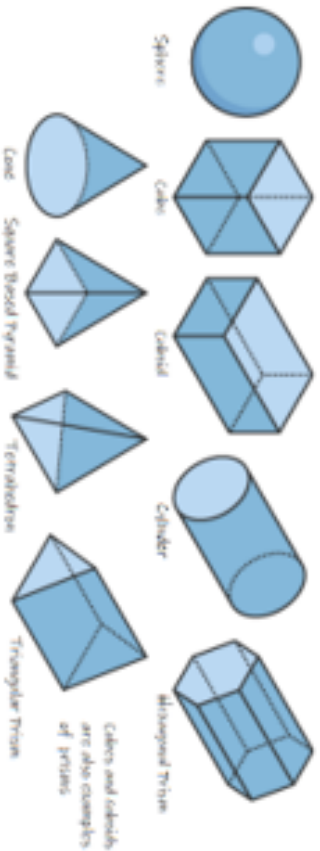
Cubes and cuboids are also examples of prisms
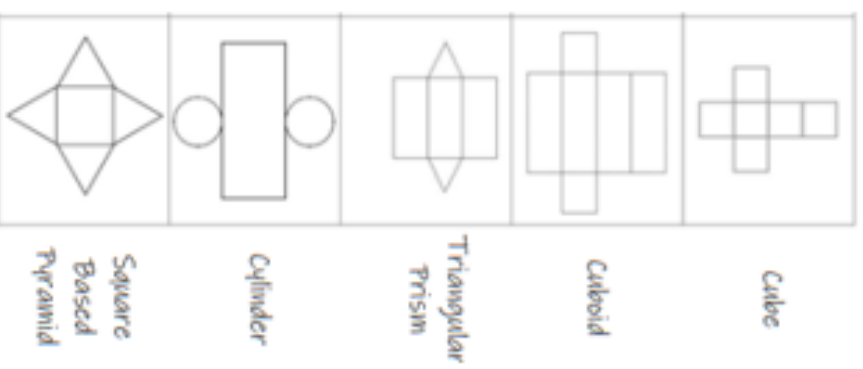
Properties of 3D shapes

Vertex
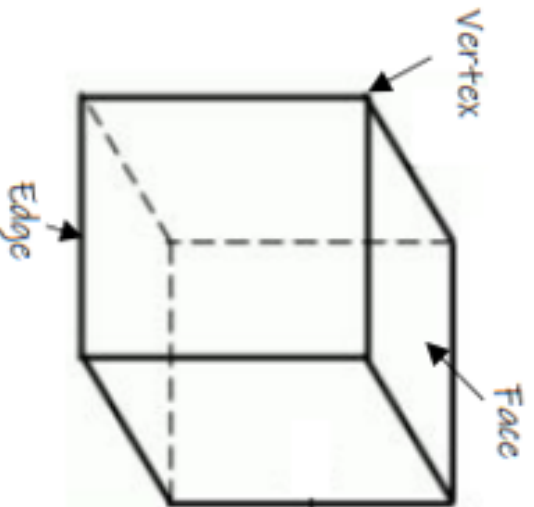
Edge

Face

A cube has 6 faces, 8 vertices and 12 edges.

You may not be able to see all the faces, edges and vertices on a shape but the hidden ones are still counted

Nets of 3D shapes

Square Based Pyramid

Cylinder

Triangular Prism

Cuboid

Cube

A net only works if you have no overlapping pieces once your 3D shape has been formed

Online clips

Q675, Q711, Q971

Volume

Component Knowledge

- To be able to calculate the volume of a prism
- To be able to calculate the volume of a sphere
- To be able to calculate the volume of a cone
- To be able to calculate the volume of a pyramid

Key Vocabulary

Volume	The amount of space that a shape occupies
Prism	A prism is a solid object with identical ends and flat faces. And the same cross section all along its length.
Length	How long a shape is.
Cross-section	A cross section is the shape made by cutting straight across an object
Face	The flat part of a 3D solid.
Pyramid	A 3D shape with a flat base and its sides meet at a single vertex. It's volume is a third of the volume of its prism.

Area – recap

$A = l \times w$

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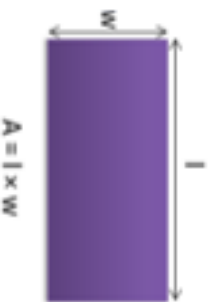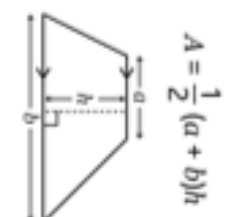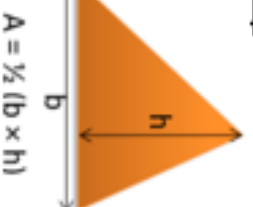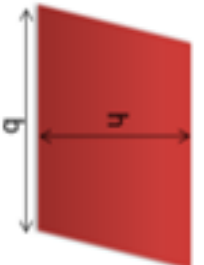
$A = \frac{1}{2}(a+b)h$

Volume of a prism = **Area of the cross section × Length**

length or height
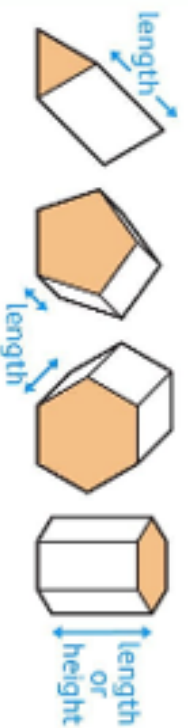
Area of cross-section

Example of volume of a prism

First start by finding the area of the cross section, which in this example is a triangle

Area of triangle $= \frac{1}{2}(b \times h)$

$Area = \frac{1}{2}(4 \times 5) = \frac{1}{2}(20) = 10cm^2$

$volume = area\ of\ cross \times length$

$volume = 10 \times 11 = 110cm^3$

Triangular cross-section

5cm
4cm
11cm

46
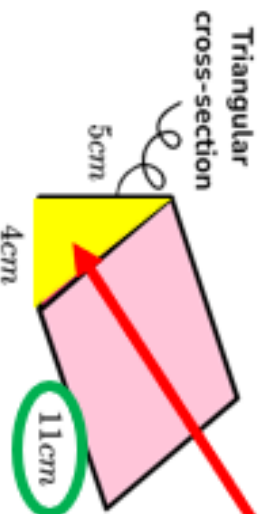
Volume of a sphere

$$Volume = \frac{4}{3}\pi r^3$$
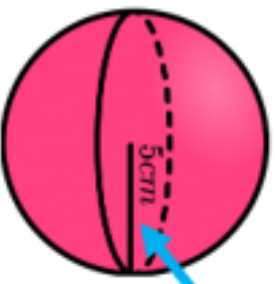
Here the radius is 5cm

$$Volume = \frac{4}{3} \times \pi \times r^3$$
$$Volume = \frac{4}{3} \times \pi \times 5^3$$
$$Volume = \frac{4}{3} \times \pi \times 125$$
$$Volume = 523.6 \ cm^3$$

Volume of a cone

$$Volume = \frac{1}{3}\pi r^2 h$$
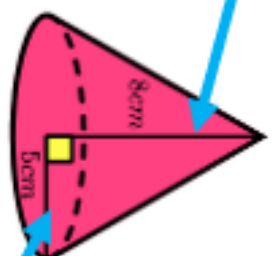
Here the height is 8cm

Here the radius is 5cm

$$Volume = \frac{1}{3} \times \pi \times r^2 \times h$$
$$Volume = \frac{1}{3} \times \pi \times 5^2 \times 8$$
$$Volume = \frac{1}{3} \times \pi \times 25 \times 8$$
$$Volume = 209.4 \ cm^3$$

Volume of a pyramid

$$Volume = \frac{1}{3} \times base\ area \times height$$
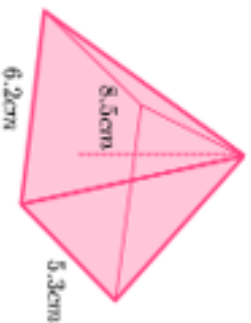
Here the base is a rectangle

8.5cm

6.2cm

5.3cm

$$Base\ area = b \times h = 6.2 \times 5.3 = 32.86 \ cm^2$$
$$Volume = \frac{1}{3} \times 32.86 \times 8.5$$
$$Volume = 93.1 \ cm^3$$
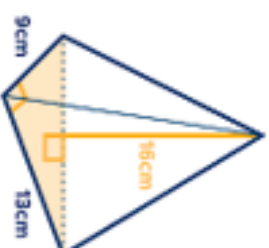
Here the base is a triangle

9cm

13cm

16cm

$$Base\ area = \frac{b \times h}{2} = \frac{13 \times 9}{2} = 58.5 \ cm^2$$
$$Volume = \frac{1}{3} \times 58.5 \times 16$$
$$Volume = 312 \ cm^3$$

Online clips

M765, M722, M697, U484, U116, U617

Surface Area

Component Knowledge

- To be able to calculate the surface area of cuboids, prisms, cones, spheres and composite shapes.

Key Vocabulary

Surface area	The space needed to cover the outside of a 3D shape.
Face	The flat part of a 3D shape.
Cuboid	A 3D object made up of 6 rectangular faces.
Prism	A 3D object in which the two ends are identical.
Cone	A 3D object which tapers from a circular or roughly circular base to a point.
Sphere	A round 3D object.

Prior knowledge required:

A net of a 3D shape is useful in calculating its surface area. The shape can be unfolded to form a net. This helps us identify the lengths of the sides so we can calculate the area of all the faces. Some common nets are shown below.

Cuboid	6 rectangles			Triangular prism	2 triangles 3 rectangles	
Cube	6 squares			Cylinder	1 rectangle 2 circles	

Area formulae which may be useful are shown below

$$A = bh$$

$$A = \pi r^2$$

$$A = \frac{b \times h}{2}$$

Surface Area- cuboids

Find the surface area:

A: b x h
$6 \times 2 = 12\text{cm}^2$

B: b x h
$6 \times 8 = 48\text{cm}^2$

C: b x h
$2 \times 8 = 16\text{cm}^2$
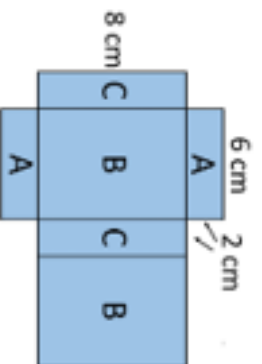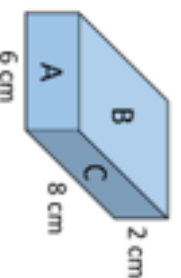
Find the areas of all the faces using the net.

Total surface area
$=12+12+48+48+16+16$
$= 152\text{cm}^2$

Add all the areas to find the total surface area.

Similar shapes

W H S

Component Knowledge

- Identify similar shapes
- Work out missing sides and angles in similar shapes
- Use parallel lines to find missing angles in similar shapes
- Understand similarity & congruence

Key Vocabulary

Enlarge	Make a shape bigger (or smaller) by a given multiplier (scale factor)
Scale factor	The multiplier of enlargement
Similar	When one shape can become another through a reflection, rotation, enlargement of translation
Corresponding	Items that appear in the same place in two similar situations

Identifying similar shapes

Angles in similar shapes do not change.
e.g. if a triangle gets bigger the angles can not go above 180°

Similar shapes

6cm

8cm

12cm
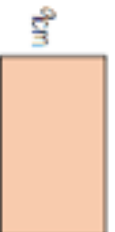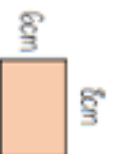
Scale Factor.
Both sides on the bigger shape are 1.5 times bigger

Compare   6 : 9   8 : 12
sides   2 : 3   2 : 3

Both sets of sides are in the same ratio

Similar triangles

Because corresponding angles are equal the highlighted angles are the same size
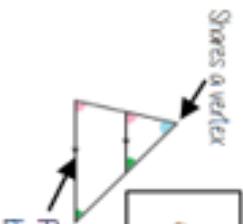
Parallel lines — all angles will be the same in both triangle

As all angles are the same this is similar — if only one pair of sides are needed to show equality
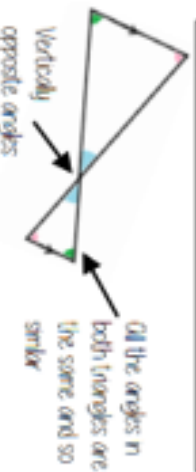
All the angles in both triangles are the same and so similar

Shares a vertex

Vertically opposite angles

Congruence & similarity

Congruent shapes are identical – all corresponding sides and angles are the same size.

A   64°
3.5 cm
B
C   5 cm   76°

K   3.5 cm
40°   5 cm
L   M

Because all the angles are the same and OAC=KM BC=LM triangles ABC and KLM are **congruent**

OĈB = KM̂ L

A   76°
3.5 cm
C   5 cm
B

H   7 cm
40°
I   10 cm
J

Because all angles are the same, but all sides are enlarged by 2 OBC and HIJ are **similar**

Information in similar shapes
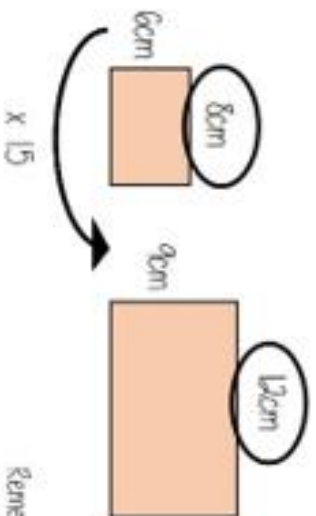
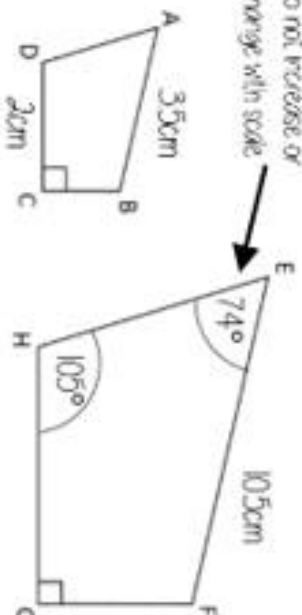Compare the equivalent side on both shapes

6cm · 8cm   × 1.5   9cm · 12cm

Scale Factor is the multiplicative relationship between the two lengths

Remember angles do not increase or change with scale

Shape ABCD and EFGH are similar

AB and EF are corresponding

Notation helps us find the corresponding sides

35cm, D 2cm C, A B (right angle at C)

E 74°, H 105°, G, F 10.5cm

Further example

Don't forget that properties of shapes aren't change with enlargements or in similar shapes

The two trapezium are similar find the missing side and angle

2 cm, 6 cm, 130°

x cm, 12 cm, ?, 60°
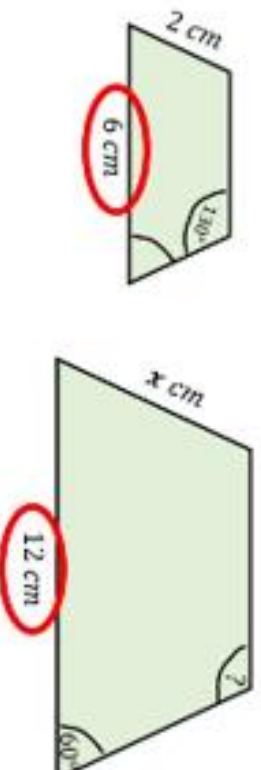
Corresponding sides identify the scale factor

$$\frac{12}{6} = 2 \qquad \text{Scale Factor} = 2$$

Calculate the missing side

Length (corresponding side) × scale factor

2cm×2

$x = 4cm$

Calculate the missing angle

130°

Corresponding angles remain the same

Enlargement does not change angle size

Corresponding angles remain the same

Online clips

M124, M377, M324, M606

50

Enlargement

Component Knowledge

- Enlarge a rectilinear shape by a given positive scale factor
- Enlarge a rectilinear shape, given a positive integer scale factor and a centre
- Enlarge a rectilinear shape, given a positive fractional scale factor and a centre
- Describe an enlargement in terms of scale factor and centre

Key Vocabulary

Enlargement	A transformation of a shape in which all dimensions are multiplied by the same number
Scale factor	The number by which dimensions are multiplied in an enlargement
Centre of enlargement	The point from which distances to the object and the image are measured

Enlarging by a scale factor

In an *enlargement* all dimensions are multiplied by the same number, called the scale factor. In this example shape A has been enlarged by scale factor 2.
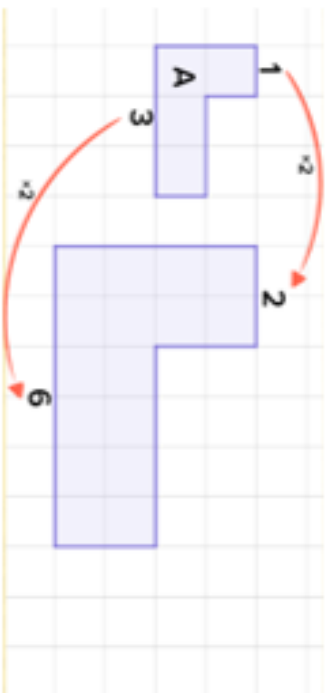
If the scale factor is smaller than 1 the dimensions are in fact reduced (divided), although the transformation is still called an enlargement! (See next page)

Enlarging by a positive *integer* scale factor from a centre
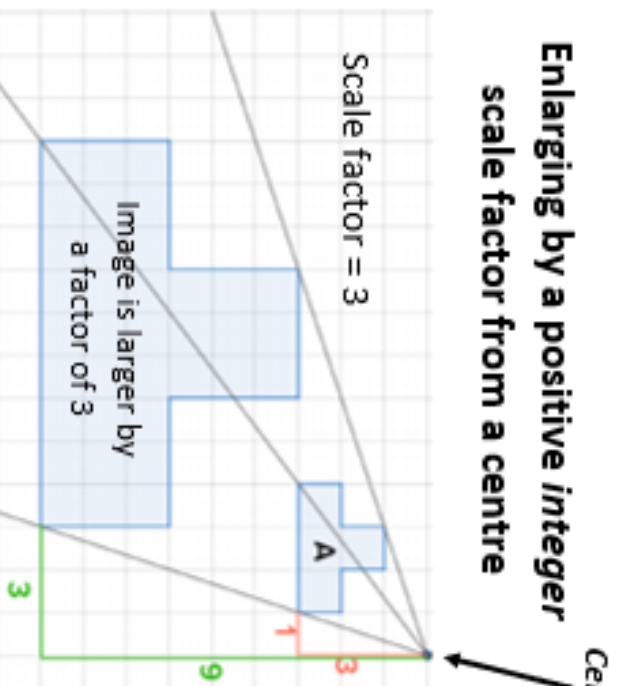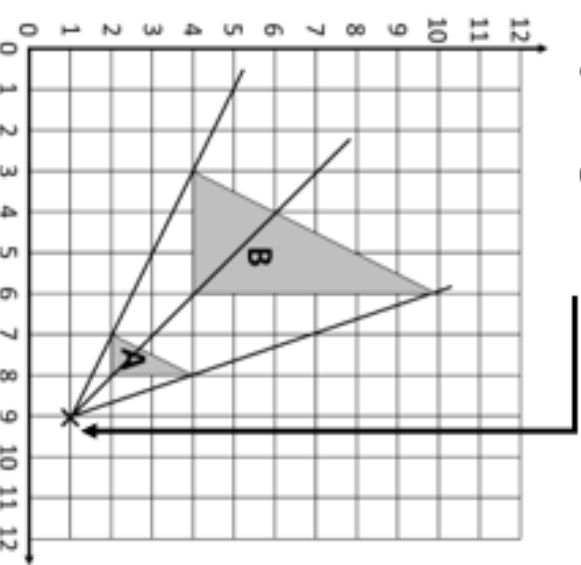
Scale factor = 3

Image is larger by a factor of 3

Centre of enlargement

Measure the distance from the centre of enlargement to each vertex of the object shape A; the corresponding vertex in the *image* is triple that distance in the same direction

If the object shape is drawn on a coordinate grid, the centre may be specified by coordinates (here the centre is (9,1))

Enlarging by a positive *fractional* scale factor from a centre

A positive scale factor that is smaller than 1 reduces the dimensions of the object shape.

Here the distance from the centre of enlargement to each vertex of the object shape A is measured and then divided by 3 to find the corresponding vertex in the image (still in the same direction).

Scale factor $= \dfrac{1}{3}$

Image is smaller by a factor of 3
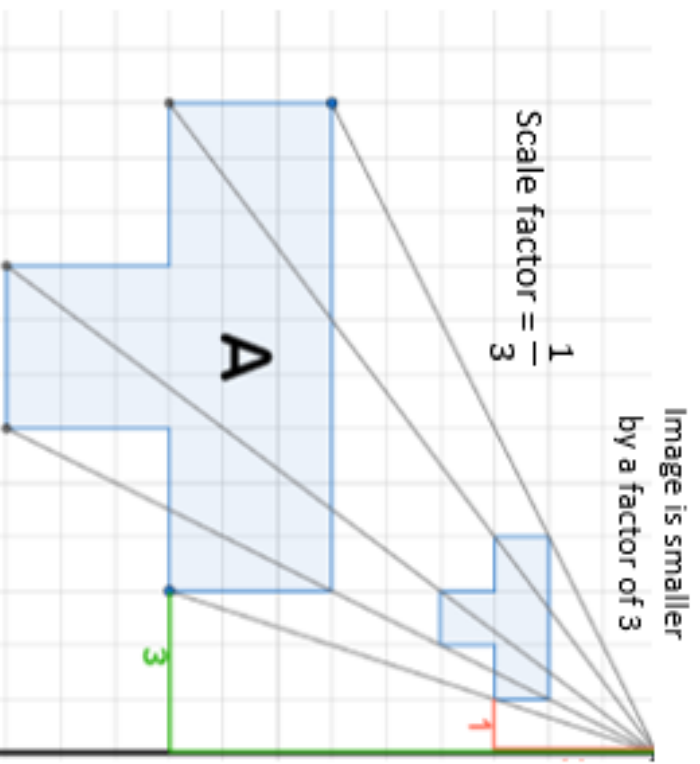
Describing an enlargement

An enlargement is easily identified as such by the change in dimensions.

To determine the scale factor, calculate the ratio of the lengths of corresponding sides in the object and its image.

For the centre, draw lines through two pairs of corresponding vertices and find their point of intersection (thus retracing the steps of the process of enlarging)

The enlargement shown here — from A to B — has scale factor 2 and centre (3,2).
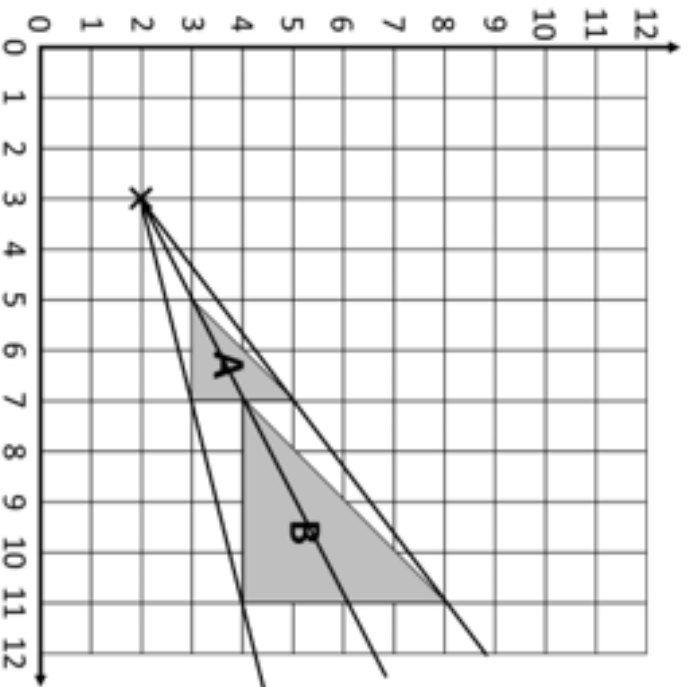
Time and Timetables

Component Knowledge

- Be able to add on times to solve worded problems
- Be able to read and interpret different timetables

Key Vocabulary

Time	The ongoing sequence of events taking place
Timetable	A table of information showing when things will happen
Journey	An act of travelling from one place to another
Hour	A period of time equal to a twenty-fourth of a day (1 hour = 60 mins, 1 day = 24 hours)
Second	The basic unit of time. There are 60 seconds in 1 minute and 3600 seconds in an hour
Minute	A unit of time equal to 60 seconds. There are 60 minutes in an hour

Analogue and Digital Clocks

There are 24 hours in one day, but the day can be measured by splitting it into two halves.

The first 12 hours of the day – from midnight to midday – are called **AM**, and the next 12 hours are called **PM**.

Each hour has 60 minutes; each minute has 60 seconds.

We use analogue and digital clocks to tell the time.

Analogue clocks show time passing by moving hands. Digital clocks show the time numerically.

twelve o'clock
12:00

half past twelve
12:30
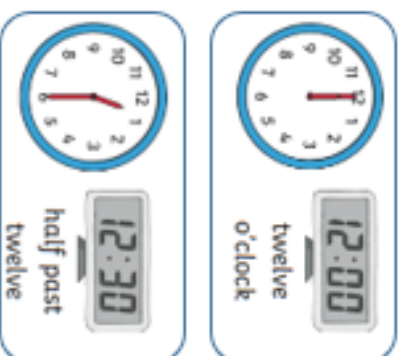
Timetables

An important life skill is that we know how to read and understand information offered to us in a variety of different formats and styles eg train and bus timetables.

Bus Timetable

Thornton Interchange	06:00	06:15	06:30	06:45	07:00
Main Road	06:10	06:25	06:40	07:00	07:10
Crossley Street	06:18	06:33	06:48	07:08	07:18
Western Road	06:25	06:40	06:57	07:12	07:25
Thornton Drive	06:32	06:47	07:04	07:19	07:32
Saltwell Common	06:40	06:55	07:12	07:27	07:40
Legrams Lane	06:48	07:03	07:20	07:35	07:48
Thornton Interchange	07:05	07:20	07:28	07:48	08:05

Example

Josh wants to travel from Newcastle to Edinburgh. He wants to leave close to 1pm. Which train will he catch and how long will the journey take?

Josh will catch the 12:54 train from Newcastle which arrives at 14:21

The journey will take 1 hour and 27 minutes

Some train times between Newcastle and Edinburgh	
Leaves Newcastle	**Arrives Edinburgh**
12:39	14:13
12:54	14:21
13:35	15:09
13:45	15:16
13:52	15:19
14:21	15:47
14:43	16:15
14:55	16:22

Online clips

Q283, Q547, Q291, Q760, Q303, Q493

Similar shapes – area & volume

Component Knowledge

- Understand the relationship between linear scale factor, area scale factor and volume scale factor
- Be able to determine similar areas & volumes given corresponding linear quantities

Key Vocabulary

Similar	When one shape can become another through an enlargement
Enlarge	Make a shape bigger (or smaller) by a given multiplier (scale factor)
Scale factor	The ratio by which a length or other measurement is increased or decreased
Ratio	Shows the relative sizes of 2 or more values
Area	2D space within a shapes boundary
Volume	3D space within a 3D shape, also known as capacity
Corresponding	Items that appear in the same place in two similar situations

Scale factors

Measure	Multiplier or Divider
Length	Scale factor
Area	(Scale factor)^2
Volume	(Scale factor)^3

$$\sqrt{\frac{Area}{scale\ factor}}$$

$$\sqrt[3]{\frac{Vol}{scale\ factor}}$$

Linear scale factor
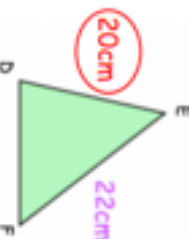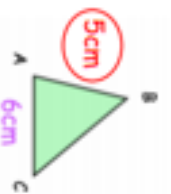
In order to find length DF
Write two of the corresponding sides as a ratio = AB : DE

With a scale factor of 4

Simplify →
5 : 20
1 : 4   This is the scale factor

To find DF- look at the corresponding length AC = 6cm
6 x 4 = **24cm**

Simplify in the form 1: n

B
A 5cm C
6cm

D
20cm E
22cm F

Area scale factor

The 2 supermarket tickets are mathematically similar

2 cm

6 cm

The area of the smaller ticket is 7cm². Calculate the area of the larger tickets.

Corresponding lengths written as a ratio = 2 : 6
Linear Scale factor = 3
Area Scale factor = 3² = 9

Area of small ticket x area scale factor =
7 x 9 = **63cm²**

Volume scale factor

A child's rugby ball is 10cm long and has a volume of 200cm3. It it is similar in shape to a full size rugby ball. A full size rugby ball is 22cm long. Find the volume of the full size rugby ball.

10cm

22cm

Corresponding lengths = 10 : 22

1 : 2.2

Volume Scale factor = 2.2³

Volume of real rugby ball = 200 x 2.2³ = 2129.6cm³

Problem solving with area & volume

A 20 Euro note is a rectangle 133mm long and 72mm wide.

A 50 Euro note is a rectangle 165mm long and 82mm wide.

Show that the two rectangles are not mathematically similar.

The rectangles will be mathematically similar if the scale factors for the lengths and widths are equal. You need to show that they are different.

Lengths	Widths
133 : 165	72 : 82
1 : 1.240606	1 : 1.1388...

The scale factors are different therefore the rectangles are not mathematically similar.

Mark has made a clay model. He will now make a clay statue that is mathematically similar to the clay model.

The model has a base area of 6cm². The statue will have a base area of 253.5cm²

Clay is sold in **10kg** bags.

Mark has to buy all the clay he needs to make the statue.

How many bags of clay will Mark need to buy?

Area scale factor = 253.5 ÷ 6 =42.25

Linear scale factor = √42.25 = 6.5

Volume scale factor = 6.5³ = 274.625

Use the area scale factor to calculate linear scale factor, then the volume scale factor.

274.625 x 2 =549.25kg of clay needed

549.25 ÷ 10 = 54.925kg clay needed

= **55 bags**

The model has made a clay model. He will now make a clay statue that is mathematically similar to the clay model.

Mark used **2kg** of clay to make the model.

Enlargement

Component Knowledge

- Enlarge a rectilinear shape by a given positive scale factor
- Enlarge a rectilinear shape, given a positive integer scale factor and a centre
- Enlarge a rectilinear shape, given a positive fractional scale factor and a centre
- Enlarge a rectilinear shape, given a positive fractional scale factor and a centre
- Enlarge a rectilinear shape, given a negative scale factor and a centre

Key Vocabulary

Enlargement	A transformation of a shape in which all dimensions are multiplied by the same number
Scale factor	The number by which dimensions are multiplied in an enlargement
Centre of enlargement	The point from which distances to the *object/original shape*) and the *image (new shape)* of an enlargement are measured

Enlarging by a positive *integer* scale factor from a centre
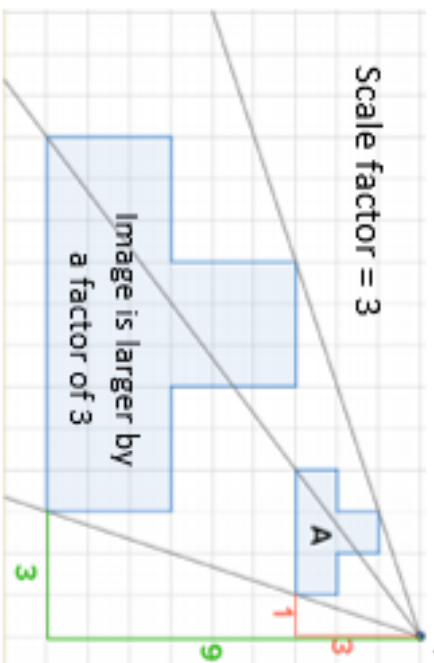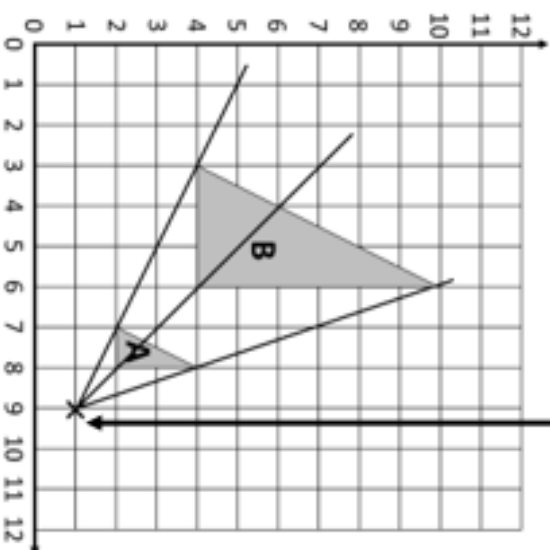
Scale factor = 3

Image is larger by a factor of 3

A

3
3
9

Centre of enlargement

Measure the distance from the centre of enlargement to each vertex of the *object* shape A; the corresponding vertex in the *image* is triple that distance in the same direction

If the object shape is drawn on a coordinate grid, the centre may be specified by coordinates (here the centre is (9,1))

B

A

Describing an enlargement

To determine the scale factor, calculate the ratio of the lengths of corresponding sides in the object and its image.

For the centre, draw lines through two pairs of corresponding vertices and find their point of intersection

The enlargement shown here — from A to B — has scale factor 2 and centre (3,2)

A

B

Enlarging by a positive *fractional* scale factor from a centre

A positive scale factor that is smaller than 1 reduces the dimensions of the object shape.

Here the distance from the centre of enlargement to each vertex of the object shape A is measured and then multiplied by $\frac{1}{3}$ (divided by 3) to find the corresponding vertex in the image (still in the same direction)
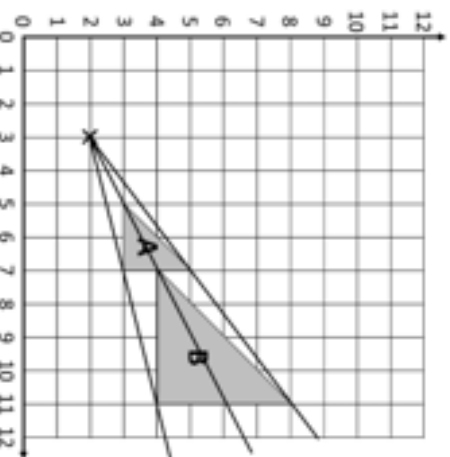
Image lengths are a third of the length of the object's (shape has got smaller)
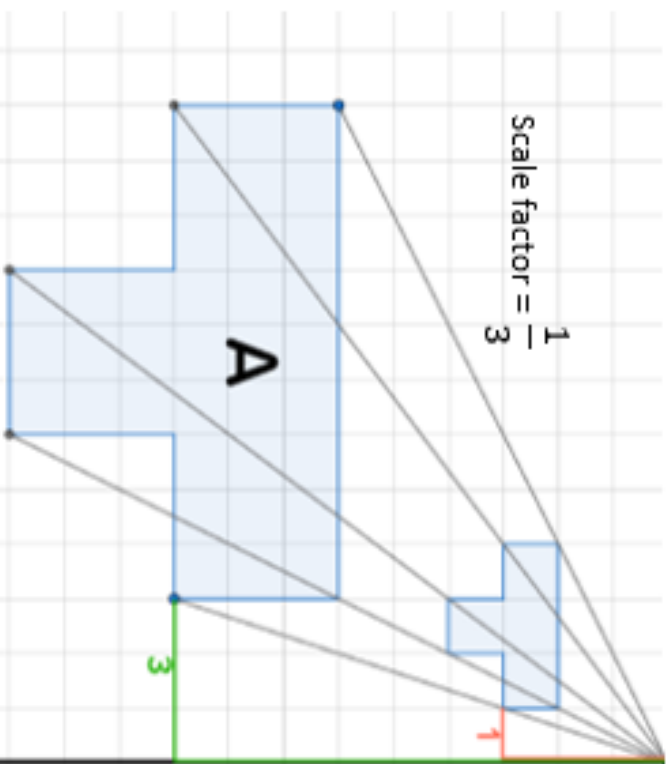
Scale factor = $\frac{1}{3}$

Enlarging by a *negative* scale factor from a centre

In enlargement by a *negative* scale factor, the object and its image are at opposite directions *from the centre.*

Here the distance from the centre of enlargement (5, 8) to each vertex of the object shape A is measured and then multiplied by 2 to find the distance to the corresponding vertex in the image B, but in the opposite direction.

Note that in this case the image is inverted as well as enlarged.

Scale factor = −2

57

Exchange rates

W H S

Key Vocabulary

Currency	Money, such as coins or banknotes, used as a medium of exchange
Exchange Rate	The rate at which the money of one country can be exchanged for the money of another country
British Pounds	The currency used in the United Kingdom
US Dollar	The currency used in The United States of America
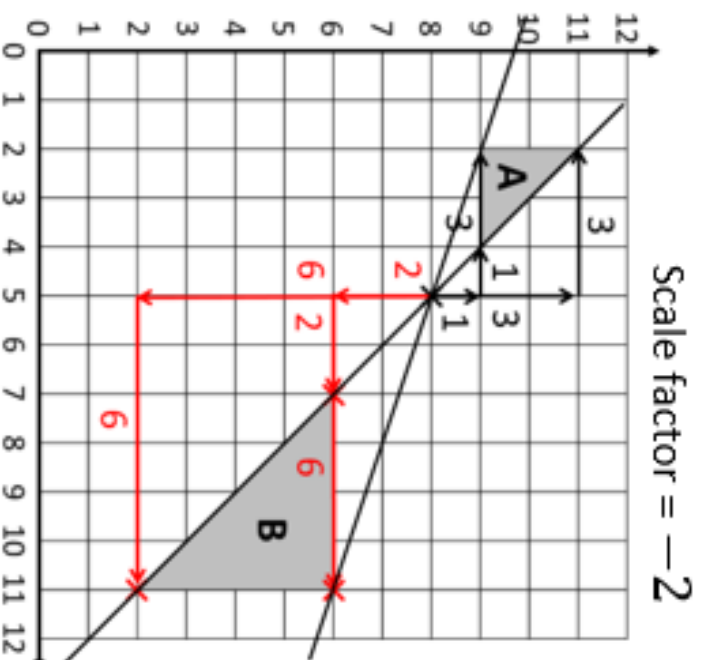
Component Knowledge

- Convert other currencies into pounds and vice versa
- Be able to compare costs in different currencies

How to work out exchange rates

1) Write down the exchange rate and the other information given
2) Highlight the rate
3) Decide whether to multiply or divide by the rate
   a. If you are going **FROM** the "1" to the other currency, then **multiply**
   b. If you are going **TO** the "1" from the other currency, then **divide**
4) Multiply or divide the given currency by the exchange rate
5) State your final answer with the correct currency symbol

Example

Given that £1 = $1.87, convert £70 to dollars.

1) £1 = $1.87
2) £1 = **$1.87** This tells us that every £1 is equal to $1.87
3) We are going from the "1" to the other currency so we multiply
4) £70 x $1.87
5) = $130.90

Comparing Currencies

Example

A coat in London costs £60. The same coat in Dublin costs €74.88 The exchange rate is £1 = €1.17.

In which city is the coat cheaper and by how much?

1) We can choose to compare in £ or €. I have chosen £.
2) Cost of coat in Dublin in £ = 74.88 ÷ 1.17 = £64.
3) This means it is cheaper to buy the coat in London as it is £4 cheaper (£64-£60=£4).

You may be given a conversion graph instead of an exchange rate

You can use the graph to find the exchange rate.
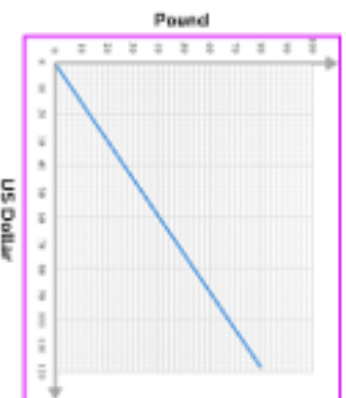
Online clip   U610

Pressure

W H S

Component Knowledge

- Calculate the pressure exerted on an object using the formula.
- Calculate the force exerted by an object using pressure and area.
- Calculate the area using pressure and force.

Key Vocabulary

Pressure	The effect of a force over an area.
Force	Force is push or pull. Measures in Newtons (N).
Area	The amount of space taken up on a flat surface.
Gravity	The force that attracts a body towards any other physical body that has mass.
Measure	To find a number that shows the size or amount of something.

Key Concepts

Whenever an object rests on a solid surface, the surface pushes back against the object, balancing the weight.

The effect that the force of gravity has on the surface depends on the size of the force and the area it is acting over. This effect is called pressure.

Pressure can be increased by increasing the size of the force or decreasing the area.

Examples

A tracked excavator has a weight of 210,000N. The area in contact with the ground is 4m².

$$Pressure = \frac{Force}{Area} = \frac{210,000N}{4m^2} = 52,500 \ N/m^2$$

A man weighs 880N and his shoes have an area of 500cm². What pressure does he put on the floor?

$$Pressure = \frac{Force}{Area} = \frac{800N}{500cm^2} = 1.6 \ N/cm^2$$

Formulae

$$Pressure = \frac{Force}{Area}$$

$$Area = \frac{Force}{Pressure}$$

$$Force = Pressure \times Area$$

Units

Force is typically measures in Newton's (N)

Sometimes pressure is measures in Pascals (Pa)

- 1 Pa is the same as 1 N/m²
- 1000 Pa equals 1 Kilopascal (kPa)

Visual Representation
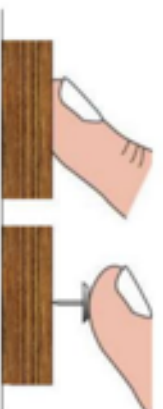
The drawing pin will sink into the wood as it has a small surface area which **concentrates** the force.

The finder won't sink in as it has a large surface area which **spreads out** the force.

Online clips

U527, U842

59

Conversion graphs

Component Knowledge

- Plot a conversion graph
- Interpret a conversion graph

Key Vocabulary

Conversion graph	Straight line graphs that show a relationship between two units and can be used to convert from one to another.
Convert	Change a value or expression from one form to another.
Axes	A fixed reference line on a grid to help show the position of coordinates.

Using conversion graphs

Litres

50
45
40
35
30
25
20
15
10
5
0

0 1 2 3 4 5 6 7 8 9 10
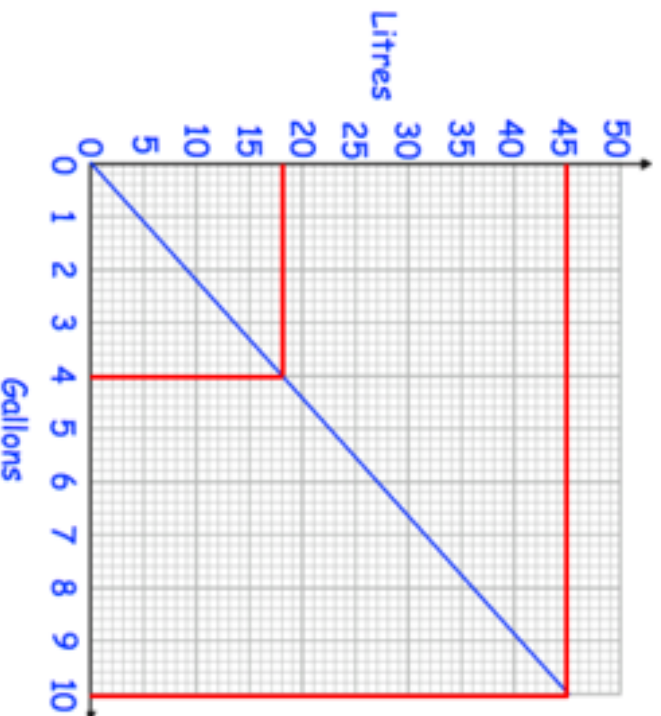
Gallons

Example 1- Use the graph to convert 45 litres to gallons.

Draw a line to the right from 45 litres until it meets the diagonal line.

Then draw from the diagonal line, down until it reaches the gallons on the x axis.

Now read the number from the axis. In this example 45 litres = 10 gallons.

Example 2- Use the graph to convert 4 gallons to litres.

Draw a line up from 4 gallons until it meets the diagonal line.

Then draw from the diagonal line to the left until it reaches the litres on the y axis.

Now read the number from the axis. In this example 4 gallons = 18 litres.

Example 3- Use the graph to convert 60 gallons to litres.

The graph does not go up to 60 gallons but you can use a value from the graph and then multiply to answer this question.

In this example the graph shows that 10 gallons is equal to 45 litres.

If you multiply 10 gallons by 6 you would get 60 gallons.

Do the same to the litres (45 × 6) and you will work out the answer.

In this example the answer is 270 litres.

Plotting conversion graphs

Use the fact 5 miles = 8 kilometres to draw a conversion graph on the grid.
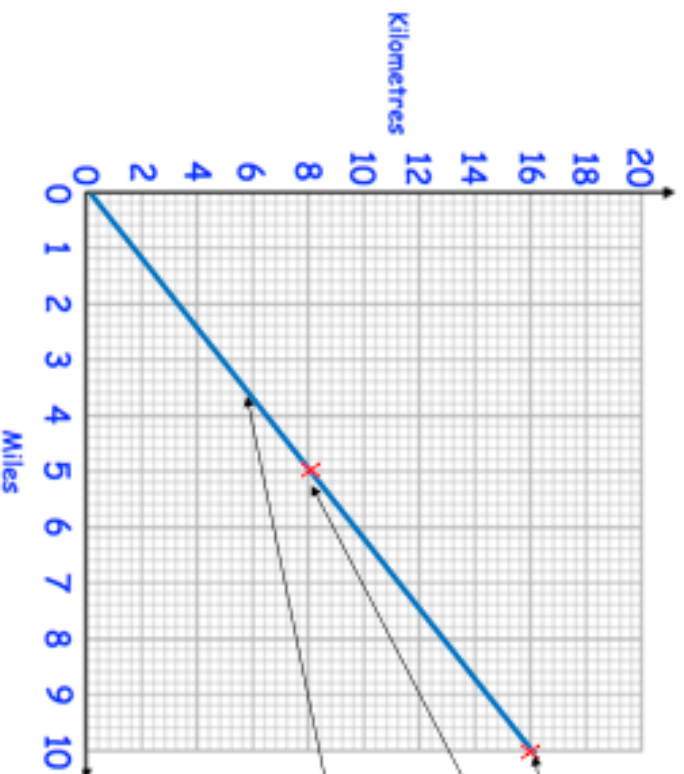
Mark a cross at 5 miles and 8 kilometres and then another one at 10 miles and 6 kilometres

Join these points up from (0,0).
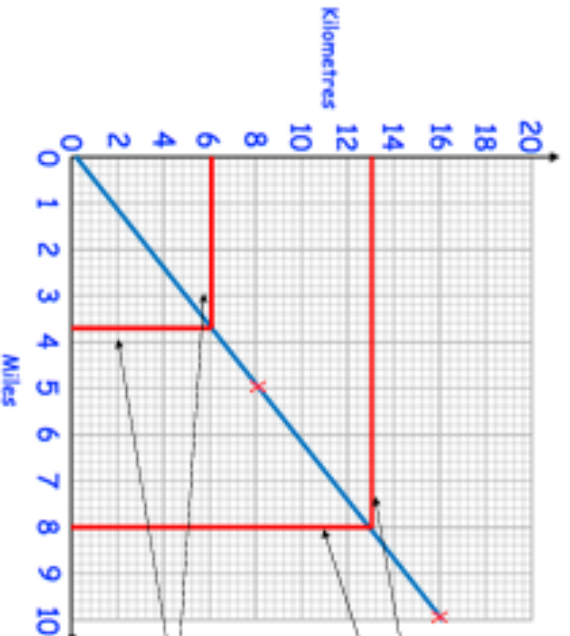
Use your graph to convert 8 miles to kilometres

Draw a line up from 8 miles until it meets the the diagonal line. Then draw from the diagonal line to the left until it reaches kilometres on the y axis. Then read the number from the axis. In this example 8 miles is 12.8 kilometres.

Use your graph to convert 6 kilometres to miles

Draw a line to the right from 6 kilometres until it meets the diagonal line. Then draw from the diagonal line, down until it reaches miles on the x axis. Then read the number from the axis. In this example 6 kilometres is 3.8 miles.

Online clip

U610

61

EXPLORING FILM MUSIC

A. The Purpose of Music in Film

Film Music is a type of **DESCRIPTIVE MUSIC** that represents a **MOOD, STORY, SCENE** or **CHARACTER** through music, it is designed to **SUPPORT THE ACTION AND EMOTIONS OF THE FILM ON SCREEN**. Film Music can be used to:

- Create or enhance a mood (though the **ELEMENTS OF MUSIC**) ⟶
- Function as a **LEITMOTIF** (see D)
- To emphasise a gesture (**MICKEY-MOUSING** – when the music fits precisely with a specific part of the action in a film e.g. cartoons)
- Provide unexpected juxtaposition/irony (using music the listener wouldn't expect to hear giving a sense of uneasiness or humour!)
- Link one scene to another providing continuity
- Influence the pacing of a scene making it appear faster/slower
- Give added commercial impetus (released as a **SOUNDTRACK**) – sometimes a song, usually a pop song is used as a **THEME SONG** for a film.
- Illustrate the geographic location (using instruments associated with a particular country) or historical period (using music 'of the time').

D. Leitmotifs

LEITMOTIF – A frequently recurring short melodic or harmonic idea which is associated with a character, event, concept, idea, object or situation.
Leitmotifs can be developed throughout the film or may be heard in the background giving a "subtle hint" to the listener e.g. the "Jaws" Leitmotif

B. How the Elements of Music are used in Film Music

PITCH AND MELODY – **RISING MELODIES** are often used for increasing tension, **FALLING MELODIES** for defeat.

DYNAMICS – **FORTE (LOUD)** dynamics to represent power; **PIANO (SOFT)** dynamics to represent weakness/calm/resolve. **CRESCENDOS** used for increasing threat or proximity and **DECRESCENDOS** are used for things going away into the distance. Horror Film soundtracks often use **EXTREME** or **SUDDEN DYNAMIC CHANGES** to 'shock the listener'.

HARMONY – **MAJOR CHORDS** are used for optimistic or heroic themes; **MINOR CHORDS** for sad or sorrowful scenes.. **DISSONANT** chords create a clash for a sinister effect.

DURATION – **LONG** notes are often used in Westerns to describe vast open spaces and in Sci-Fi soundtracks to depict outer space; **SHORT** notes can depict busy, chaotic or hectic scenes. **PEDAL NOTES** – long held notes in the **BASS LINE** used to create tension and suspense.

TEXTURE – **THIN/SPARSE** textures used for bleak or lonely scenes; **THICK/FULL** textures used for active scenes or battles.

ARTICULATION – **LEGATO** (smooth) for flowing or happy scenes, **STACCATO** (short) for 'frozen' or 'icy' wintery scenes. **ACCENTS (>)** for violence or shock.

TEMPO – sets the pace for a fast chase, intense battle or a slow moving emotional scene. **IRREGULAR TIME SIGNATURES** or **OSTINATO** (repeated) rhythms can create tension or excitement.
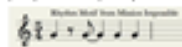
C. Film Music Key Words

SOUNDTRACK – The music and sound recorded on a motion-picture film. Can also mean a commercial recording of a collection of music from a film sold individually.

STORYBOARD – A graphic organiser in the form of illustrations and images displayed in sequence to help the composer plan their soundtrack.

CUESHEET – A detailed listing of **MUSICAL CUES** matching the visual action of a film so that composers can time their music accurately.

DIEGETIC FILM MUSIC – Music within the film for both the characters and audience to hear e.g. a car radio, a band in a nightclub or sound effects.

NON-DIEGETIC FILM MUSIC – also known as **UNDERSCORE, BACKGROUND** or **INCIDENTAL MUSIC** which only the audience can hear.

E. History of Film Music

Early films had no soundtrack (**"SILENT CINEMA"**) and music was provided live, usually **IMPROVISED** by a pianist or organist.

Today, film music often blends **POPULAR, ELECTRONIC** and **CLASSICAL** music together in a flexible way that suits the needs of a particular film.

F. Film Music Composers and their Soundtracks

Jerry Goldsmith
Planet of the Apes
Star Trek: The Motion Picture
The Omen
Alien

John Williams
Star Wars
Jaws
Harry Potter
Indiana Jones
Superman, E.T.

James Horner
Titanic
Apollo 13
Braveheart
Star Trek II
Aliens

Ennio Morricone
The Good, The Bad and The Ugly
For a Few Dollars More
The Mission

Danny Elfman
Mission Impossible
Batman Returns
Men in Black
Spider Man

Hans Zimmer
The Lion King
Gladiator
Dunkirk
Blade Runner 2049
No Time to Die

Bernard Hermann
Psycho
Vertigo
Taxi Driver

WESTHOGHTON HIGH SCHOOL -ORIENTEERING

Skills and Techniques:

➔ **Directions:** 4 key compass directions: North, South, East, West
More complex compass directions: North East, North West, South East and South West

➔ **Map Reading:** Recognise symbols on a map. Understand that maps and aerial view pictures are not the same. Recognise these features on aerial photographs

➔ **Human features:** Know that a human feature, is influenced by man (Road, cities, churches). Recognise these on a map

➔ **Physical Features:** Know that a physical feature, is natural (Forest, rivers, beaches, hills) Recognise these on a map

➔ **Directional language:** To describe the physical and human features in a location or a route.

Diagrams and Symbols:

Map Symbols:

- Open Grass
- Rough Open
- Grass Garden
- Undergrowth
- Sandpit
- Tarmac
- Buildin
- g
- All weather pitch
- Canopy
- Steep Bank
- Lamp
- Post Flag
- Pole Tree
- Goal Post
- Netball Post
- Orienteering
- Point Outer

Positions:

➔ The main aim of orienteering is to complete the set course by finding control markers in the correct order in the shortest time.

➔ Although it Is based on accurate map reading it is also a test of physical fitness.

➔ You must find all the controls you are told to visit and record them on your score sheet.

➔ You have to consider the terrain you are moving over ensuring your safety and the safety of any team members at all times, taking into account the varying fitness level of all your team members.

➔ In order to be given a finish time for finding controls the whole team has to finish together

Key Features:

➔ Orienteering control

➔ Orienteering Map

Key Words:
Location, Speed
Cardiovascular Fitness
Setting a Map
Navigation
Adventurous
Diverse Direction
Key
Catchment features
Terrain
Map
Compass
Control point
Thumbing
Attack points
Pacing

Key components:

➔ **Map**
A diagrammatic representation of an area showing physical features

➔ **Key**
Explains the meanings of symbols

➔ **Route**
A way from getting from a starting point to a destination

➔ **Location**
The place where something is

➔ **Orienteer**
To find your way across areas using a map.

➔ **Grid reference**
map reference indicating a location in terms of a series of vertical and horizontal grid lines

➔ **Latitude**
Imaginary lines north and south of the equator

➔ **Longitude**
Imaginary lines from East to West around the globe

Westhoughton High School – ACTIVITY: RUGBY

Passing:

- Hold the ball in two hands with your fingers spread across the seam, with your chest facing forward.
- Draw the ball back across one hip, keeping your elbows slightly bent, as you turn your chest away from the target.
- Sweep the ball off your hip as you swing your hands through an arc, keeping your elbows close to your body.
- Release the ball with a flick of the wrists and fingers.
- Follow through with your fingers pointing to the target - chest high in front of the receiver.

Passing the ball
- Keep the ball off the chest
- Look at the target
- Push the ball towards the catcher
- Turn shoulders towards the catcher
- Follow through with the hands towards the catcher

Catching

- **Call for the ball**
- **Keep eyes on the ball**
- **Hands up and make W shape**
- **Reach over the side of the body**
- **Catch with ten points of contact (both hands)**
- **Continue running with ball in both hands**

Tackling

- Position your body to the opponent's right-hand side (safe side).
- Position your left foot forward into a slight opposition.
- Make contact by putting your right shoulder into the opponent's mid-right thigh.
- Make sure your head is on the other side of the ball carrier so their body is between your shoulder and head.
- Bring your arms up and wrap them around the ball carrier, just above their knees (
- Squeeze your arms and pull the ball carrier into your body.
- Push your shoulder into the ball carrier, as though you are trying to push him away with your head.
- Continue pushing until both you and the ball carrier fall to the ground.

Playing the Ball (Rugby League)

- After the tackle, lift the ball clear of the ground, face their opponent's goal line and roll it under their foot to the player behind them, the acting half back.
- The ball has to always travel backwards.
- A player can play the ball to themselves by heeling it backwards, stepping over the ball and then picking it up to run with it or to pass to another player.

Presenting the ball (Rugby Union)

- 'Eyes up' to keep head and neck inline
- Enter the ruck from behind the player (through the gate)
- Keep head and shoulders above hips at all times
- Make contact by binding on a player using the whole arm

Rugby League

Rules

➔ Game starts and restarts with a kick off.

➔ Three officials- Referee and two touch judges.

➔ Passing from the hand must travel level or backwards to the receiver.

➔ Tackling must be below shoulder

➔ If a player knocks on (drops the ball forward) the opposing side will gain possession via a scrum.

➔ When referee calls that the tackle is complete you must stand up and play ball between your legs to a player behind

➔ You must be behind the kicker when the ball is kicked to be onside

Positions

- 1 Full back
- 2 Right wing
- 3 Right centre
- 4 Left centre
- 5 Left wing
- 6 Stand-off half
- 7 Half-back
- 8 Prop
- 9 Hooker
- 10 Prop
- 11 Second Row
- 12 Second Row
- 13 Loose Forward

Points System:

4 points = TRY
2 Points = Penalty/Conversion
1 Point = Drop goal

Tactics in possession:

- 6 tackles (or chances to score), kick on 5th.
- If the ball goes out of play after such a kick, play restarts with a six-player scrum.

Rugby Union

Positions

- 1 Loosehead Prop
- 2 Hooker
- 3 Tighthead Prop
- 4 Second Row
- 5 Second Row
- 6 Blindside Flanker
- 7 Openside Flanker
- 8 Number 8
- 9 Scrum Half
- 10 Fly Half
- 11 Left Wing
- 12 Inside Centre
- 13 Outside Centre
- 14 Right Wing
- 15 Fullback

Points System:

5 points = TRY
3 Points = Penalty and Drop goal
2 Point = Conversion

Tactics in possession:

- Unlimited tackles
- Attacking side continue until they lose ball or concede penalty
- If the ball is kicked out of play restarted with a lineout Scrum used for knock-ons, forward pass restarts

Rules

➔ Game starts and restarts with a kick off.

➔ Three officials- Referee and two touch judges.

➔ Passing from the hand must travel level or backwards to the receiver.

➔ Tackling must be below waist (sternum)

➔ If a player knocks on (drops the ball forward) the opposing side will gain possession via a scrum.

➔ You may not tackle a player in the air. You must enter a ruck from the back foot of your side of the ruck.

➔ Any player in front of a player kicking must wait for the kicker to pass or they will be offside.

Key Words:

Pass
Run
Tackle
Ruck
Maul
Scrum
Penalty
Free-kick
Knock-on
Forward pass
High tackle
Defensive line
Scissor
Loop

Skills and Techniques: Back Crawl

→ **Body position**
Horizontal
Streamlined
Head still
Eyes looking upward
Hips close to surface

→ **Leg Action**
Continuous up and down motion
Legs close together
Relaxed ankles

→ **Arm Action**
Thumbs leave the water first
Little finger entry

Skills and Techniques: Front Crawl

→ **Body position**
Flat and streamlined
Eyes looking forwards and downwards

→ **Leg Action**
Continuous and alternating
Starts from the hip
Ankles relaxed

→ **Arm Action**
Thumb enter the water first
Enter between the head line and shoulder line
Elbow exits first

→ **Breathing**
Head rolls to the side to breath
Bilateral breathing

Skills and Techniques: Breaststroke

→ **Body position**
As horizontal as possible Shoulders horizontal

→ **Leg Action**
Starts in glide position
Heels drawn towards the seat
Feet turned out Kick backwards with a circular whipping action

→ **Arm Action**
From glide position, hands turn outwards
Pull downwards and outwards to inline with shoulders
Arms meet in the centre of the body and drive out to glide position

Skills and Techniques: Butterfly

→ **Body position**
Horizontal, with a wave like movement from head to toe Shoulders kept level

→ **Leg Action**
Legs close together
Ankles relaxed toes pointed
Action starts from the hips
Kick up and down with a bend at the knee

→ **Arm Action**
Thumb first entry
Entry shoulder width apart
Pull downwards, with bent elbows
Hands leave the water little finger first
Arms clear the water just above the surface

→ **Breathing**
Lift head and push chin forwards
Head lowered quickly but smoothly

Back Crawl

→ Start -Back

→ Turn –Tumble

Front Crawl

→ Start -Racing Dive
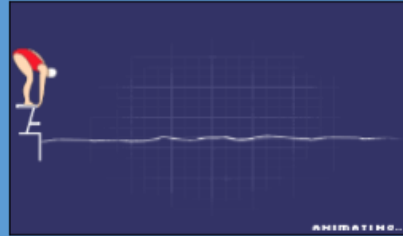
→ Turn-Tumble
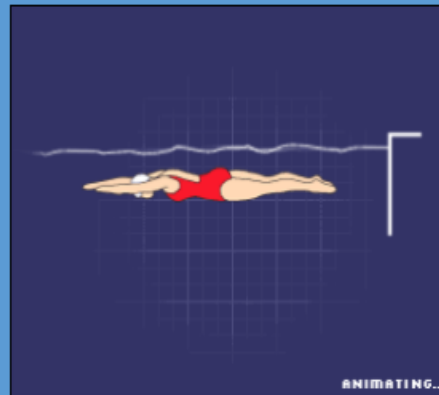
Breaststroke and Butterfly
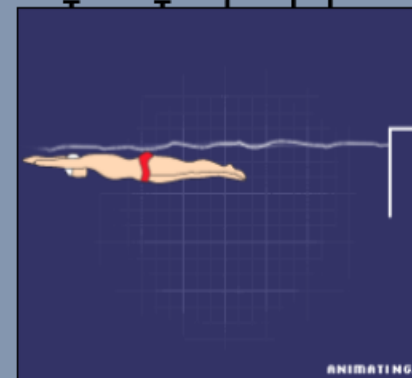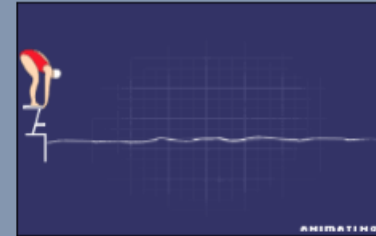
Tumble turns

Stage one

- Swim toward the turning wall.
- Ensure you breathe on the last stroke before turning.
- On the last stroke, bring both arms down and next to the hips.
- Keeping the body straight, hold feet approximately 20 cm under the water surface.

Stage two

- Bring the arms up and swing over the head whilst brushing the upper arms against the ears.
- Tuck chin into chest and begin rotating body forward.
- On complete rotation, push against the wall with the balls of the feet and kick a minimum of four times to generate pace.
- Complete one full stroke before returning to breathing pattern.

Racing start-Front crawl, breaststroke and butterfly

1: Chin and chest
2: Arm above head, squeeze ears
3: Tip forward
4: Hips high
5: Stretch out

Key words

Splits, Pacing, Negative spilt, positive split, Even split, False start, Technical official,

Scoring

Success in swimming is judged on times and places.

Start of the race

Races are started with electronic pistols and are only sounded again if an athlete makes a false start.

Finish the race

In all races swimmers must strike a pressure pad at the end of their lane to stop the clock.

Officials

Starter

Clerk of course - these people line up competitors in correct order, ready for starting.

Timekeepers, Inspectors of turns ,Judges of stroke ,Finish judges

Disqualifications are also a result of technical rules violations. These include:

- **freestyle** - stepping or walking on the bottom of the pool, pulling on the lane rope, not touching the wall on a turn, or not completing the distance
- **backstroke** - not remaining on the back throughout the swim except when turning, pulling or kicking into the wall once turning past the vertical onto the breast, turning onto the breast before touching the wall with the hand at the finish of the race
- **breaststroke** - not swimming on the breast, an illegal kick such as flutter, dolphin, or scissors, non-simultaneous movements of the arms, taking two arm strokes or two leg kicks while the head is underwater, or touching with only one hand at the turns or finish instead of two
- **butterfly** - non-simultaneous movements of the arms or legs, pushing the arms forward under the water instead of over the water surface, using a breaststroke-style kick, or touching with only one hand at the turns or at the finish instead of two

WESTHOUGHTON HIGH SCHOOL KS3 PE KNOWLEDGE ORGANISER – ACTIVITY: TABLE TENNIS

Serve:

➔**Serve:** The first shot to begin a rally. The serve is alternated between the two players, after two serves the service goes to the opposite player regardless of the winning shot.

➔There are different types of serving.

➔Forehand and Backhand serves

➔Short and Long serves.

➔Topspin and Backspin serves

➔When serving in Table Tennis, if the ball hits the net but still bounces on the opponents side of the table, the point is a let (which means it needs to be replayed).

Backhand Push:

➔**Backhand push:** The ball is played on the backhand side, with a flat bat face to push the ball over the net.

➔The Backhand push shot is a controlled shot.

➔Step into the shot with your strongest foot with the paddle facing towards where you want to ball to be placed.

Forehand Push:

➔**Forehand push:** The ball is played on the forehand side, with a flat bat face to push the ball over the net.

➔The Forehand push shot is a controlled shot.

➔Step into the shot with your weakest foot with the paddle facing towards where you want to ball to be placed.

➔Make sure our body is opened to make the shot.

Forehand and Backhand Chop:

- Start the paddle from the top of your body and move across your body to get that chopping position.
- Forehand, move from right to left, in an upwards and downwards movement.
- Backhand chop, move from left to right, in an upwards and downloads movement.

Forehand and Backhand Drive:

➔**Forehand/Backhand drive:** A shot played on the forehand side, contact cuts on an angle (closed bat position) to the ball to make it move differently,

Key Words:

Table
Ball
Bat
Open/Closed/ Neutral Grip
Position
Service
Drives
Push
Smash
Lob
Block
Net

WESTHOUGHTON HIGH SCHOOL KS3 PE KNOWLEDGE ORGANISER – ACTIVITY: TABLE TENNIS

Tactics:

➔ Play on your opponent's weaknesses.
➔ Play consistently and don't make unforced errors.
➔ Move your opponent around the table.
➔ Vary your strokes.
➔ Vary the speed, spin and direction of your strokes.

Rules:

➔ A serve MUST bounce on both sides of the table.
➔ Players cannot volley the ball, it must always bounce first.
➔ A player can serve in any direction, it does not have to be diagonal.
➔ You cannot touch the table with any part of your body during a point,
Service rules:
➔ Must serve behind the white line.
➔ The ball must be presented to your opponent.
➔ you must toss the ball up 6 inches and hit the ball on the way back down.

Positions:

Ready Position

The ready position is a key starting point when fielding. It provides you with the best opportunity to catch and/or stop the ball and allows you to move into position quickly. This is done by being on your toes with your body weight slightly towards where the ball is coming from with hands ready.

Forehand Drive

Hip to lip (start and finish points for the bat)

Finish with your index finger pointing towards the target (like a gun)

Backhand Push

Making an L shape with your elbow on the backswing and push your arm forwards to an I on the swing

Finish with your index finger pointing towards the target

Scoring System:

- **Scoring system to 21.**
- **Two serves each**
- **You score a point by your opponent not returning the shot or your opponent not being able to return the shot correctly.**
- **You need to beat your opponent by two clear points.**

Key Words:

Table Ball
Bat
Open/Closed/Neutral grip position
Service
Drives
Push
Smash
Lob
Block
Net

USER GROUPS in Sport/Fitness

- Young children
- Teenagers
- People with disabilities
- Parents (singles or couples)
- People who work
- Unemployed/economically disadvantaged people

- Gender
- People from different ethnic groups
- Retired people/people over 60
- Families with children
- Carers
- People with family commitments

Barriers faced by user groups

□ Employment and unemployment
□ Family commitments
□ Lack of disposable income
□ Lack of transport
□ Lack of positive sporting role models
□ Lack of positive family role models or family support
□ Lack of appropriate activity provision
□ Lack of awareness of appropriate activity provision
□ The lack of equal coverage in media in terms of gender and ethnicity by the media

SOLUTIONS TO BARRIERS

•Appropriate programmes
•Specific sessions
•Suitable activities
•Appropriate timings
•Targeted promotions
•Use of role models
•Access to facilities
•Appropriate pricing
•Access to transport
•Initiatives

Key Vocabulary: Veins Arteries Circuit Plyometric Interval Continuous Weight Fartlek Water Safety User Groups

BALANCED DIET/NUTRITION

A balanced diet is essential for maintaining overall health and providing your body with the nutrients it needs to function effectively. Here's a breakdown of the key components:

1. Macronutrients

•**Carbohydrates)**: The body's main source of energy. Focus on complex carbohydrates like whole grains, fruits, and vegetables. Limit refined sugars and highly processed carbs.

•**Proteins:** Essential for building and repairing tissues. Include lean meats, fish, eggs, legumes, nuts, and dairy products.

•**Fats)**: Necessary for hormone production, nutrient absorption, and brain health. Prioritize healthy fats from sources like avocados, nuts, seeds, and olive oil while limiting saturated and trans fats.

2. Micronutrients

These are vitamins and minerals needed in smaller amounts but are crucial for various bodily functions.

•**Vitamins**:: B vitamins (like B12 and folate) and vitamin C, Vitamins A, D, E, and K.

•**Minerals**: Key minerals include calcium, potassium, iron, magnesium, and zinc.

•**Fibre:** Fibre is important for digestive health and helps regulate blood sugar levels. Aim for whole grains, fruits, vegetables, and legumes to increase fibre intake.

WATER SAFETY

1.Floating: The ability to float on your back helps conserve energy and breathe more easily while waiting for rescue.

2.Treading Water: This skill involves moving your arms and legs to keep your head above water, allowing you to stay in one place without sinking.

3.Swimming for Distance: Knowing how to swim at least 25 meters can help you reach safety or a shore if needed.

4.Controlled Breathing: Practicing proper breath control allows you to stay calm, conserve energy, and avoid panic in emergency situations.

Year 9
Term 2: Health
Knowledge Organiser

Swimming rules
- No running:
- Supervise children:
- No diving in shallow water:
- Shower before entering:

Hydration

Hydration is essential in a balanced diet because water supports nearly every bodily function, including digestion, nutrient absorption, temperature regulation, and waste elimination. Staying properly hydrated helps maintain energy levels, promotes healthy skin, lubricates joints, and ensures that cells function optimally.

Key Vocabulary: Veins Arteries   Circuit   Plyometric Interval Continuous   Weight   Fartlek   Water Safety   User Groups

KS3 Knowledge Organiser – Relationships and Sex Education

Healthy Relationships

Key words:

1. **Platonic relationship -** A friendship or relationship where there is no romantic, intimate or sexual feelings. E.g. friends and colleagues.
2. **Intimate relationship –** A relationship which can include a sexual attraction and sexual activity. E.g. boyfriend, girlfriend, married couples.
3. **Familial relationship -** A relationships with someone who has a blood or legal tie to you. E.g. parents, siblings, cousins, grandparents, uncles, aunts, etc.
4. **Toxic relationship -** A relationship that has a negative impact on your mental health and self-esteem.

Good Relationship	Toxic Relationship
• They make you feel good. • They listen. • They support you. • They are trustworthy. • They handle conflict respectfully and respect boundaries. • Friends not followers.	• Might say "brutally honest" things to you which are hurtful. • Put pressure on you to do things you don't want to do. • Be manipulative. • Put your down. • Laugh at you or encourage others to laugh at you. • Talk about you behind your back. • Deliberately exclude you. • Take the 'banter' too far. • Share things about you online.

Types of Abuse

Physical Abuse: Hitting slapping, shoving, grabbing, pinching, biting, hair pulling, etc. are types of physical abuse. This type of abuse also includes denying a partner medical care or forcing alcohol and/or drugs upon them.

Sexual Abuse: Coercing or attempting to coerce any sexual contact or behaviour without consent. Sexual abuse includes, but is certainly not limited to rape, rape, non-consensual touching of sexual parts of the body, treating one in a sexually demeaning manner.

Emotional Abuse: Undermining an individual's sense of self-worth and/or self-esteem is abusive. This may include, but is not limited to constant criticism, diminishing one's abilities, name-calling, or damaging one's relationships with others (e.g. friends, family)

Psychological Abuse: Elements of psychological abuse include - but are not limited to - causing fear by intimidation; threatening physical harm to self, partner, children, or partner's family or friends; destruction of pets and property; and forcing isolation from family, friends, or school and/or work.

Economic Abuse: is defined as making or attempting to make an individual financially dependent by maintaining total control over financial resources, withholding one's access to money, or forbidding one's attendance at school or employment.

Where to get more help and support:
- Parents and trusted family School Staff and Wellbeing Team
- NSPCC - Helpline: 0808 800 5000 (24 hours, every day), www.nspcc.org.uk
- Childline - Helpline: 0800 1111(24 hours, every day) www.childline.org.uk
- Women's Aid - Helpline: 0808 2000 247 24hr www.womensaid.org.uk
- Men's Advice Line - Helpline: 0808 801 0327 Mon- Fri 9-5 www.mensadviceline.org.uk
- National Bullying - Helpline www.nationalbullyinghelpline.co.uk

Consent

Key words:

1. **Sexual consent:** the giving of permission by a person to engage in any form of sexual activity including penetrative and oral sex.
2. **Affirmative consent:** Consent is only given when a person agrees verbally to engage in
3. sexual activities including penetrative and oral sex.
4. **Coercion:** The action or practice of persuading someone to do something they wouldn't normally do or something they don't want to do by using force or threats.
5. **Minor:** A person who is under the age of 18 and legally considered a child.

Consent is...	Consent cannot be given if...
• **Freely given.** It's not okay to pressure, trick, or threaten someone into saying yes. • **Reversible.** It's okay to say yes and then change your mind — at any time! • **Informed.** You can only consent to something if you have all the facts. • **Enthusiastic.** You should do stuff you WANT to do, not things people expect you to do. If someone doesn't seem enthusiastic stop and check in. • **Specific.** Saying yes to one thing (going to the bedroom to make out) doesn't mean you're saying yes to other things (having sex).	• **When a person is drunk or high,** to the point that they are unable to speak or look after themselves. • **Asleep or Passed Out** – if they are not conscious they are unable to agree to any sexual activity. If someone passes out whilst engaging in sexual activity –STOP! • **They are Underage** – Legally a person under the age of 16 cannot give consent to any sexual activity. • **Mental disability or learning difficulties** which mean they are unable to fully understand what they are consenting to.

Act	Definition	Legal Consequences
Rape	A rape is when a person uses their penis without consent to penetrate the vagina, mouth, or anus of another person.	Maximum of fifteen years in prison. Aggravated Rape is punished by a maximum of twenty years in prison. Both offences would result in placement on the sex offenders register.
Sexual assault	When a person is coerced or forced to engage against their will, or when a person, touches another person sexually without their consent. Touching can be done with any part of the body or with an object.	Up to 10 years in prison and placement on the sex offenders register.
Sex between minors	When both parties involved the sexual activity are under 16 but have consented to the activity.	If two 13 – 15 year olds engage in consensual sexual activity and both know that the other is under 16, they could both be found guilty of an offence with a penalty of up to 5 year's imprisonment. If one party is under 13 and the other under 18 it is statutory rape punishable by up to life imprisonment.

- Rape Crisis Helpline: 0808 802 9999 (12-2:30 and 7-9:30) www.rapecrisis.org.uk
- Survivors UK – Male Rape and Sexual Abuse Support www.survivorsuk.org
- RASAC (Rape and Sexual Abuse Support Centre) National Helpline: 0808 802 9999 (12-2.30 & 7-9.30) www.rasasc.org.uk

KS3 Knowledge Organiser – Relationships and Sex Education

Online Safety

Strategies for staying safe online:

1. **Don't post any personal information online** e.g. address, phone number, email address.
2. **Think carefully before you post** – once you post it you lose control of it.
3. **Keep your privacy settings as high as possible.**
4. **Never give out passwords.**
5. **Not everyone is who they say they are online.** Don't befriend people you don't know in real life. Don't meet up with people you've met online. Tell a parent/carer if someone you've met online is pressuring you to meet.
6. **Respect** other people's views, even if you don't agree with it. There is never a reason to be rude.
7. **If you see something that makes you uncomfortable or unsafe** tell a trusted adult immediately.

Appropriate online behaviour:

A person's digital footprint cannot be deleted and can be accessed at any time by others. To promote a positive digital footprint there are **5 simple rules:**

1. **Would you want your grandmother to see it?** Is that photo/video/comment appropriate for the wider public audience? Would you want a future partner or employer to see it? Once something is online it stays forever.
2. **Do you really think that is private?** Just because your privacy settings are high doesn't mean that someone else can't repost or screenshot what you have posted.
3. **Would you say it to someone's face?** If you wouldn't say it to someone face, don't say it online. Portray yourself in a positive way as this may be seen by future friends, partners or employers.
4. **Is this your work to publish/use?** Reposting or using someone else's work if fine if you credit the original owner creator. If you don't it is plagiarism.
5. **Would you want someone to do it to you?** How would you feel if someone posted a picture of you or made a comments about you that you didn't like or want online?

Taking, sending, and receiving sexual images…

- **It is a criminal offence to create or share explicit images of a child**, even if the person doing it is a child. The law applies to anyone under the age of 18.
- **'Cyberflashing' is where someone sends sexual image or pornography to an unsuspecting person.** It became a criminal offence in 2022. People convicted of 'cyberflashing' could face up to two years in prison.
- **Sextortion:** when a victim is blackmailed after sending explicit images of themselves. 2 in 3 sextortion victims are girls below the age of 16.

Ways in which pornography can distort views of relationships and sex

- Sex ends when a man ejaculates
- Women orgasm every time they have sex
- Everyone wants to have sex all the time
- Sex is an aggressive act of dominance
- People want to have sex with more than one person at a time.
- Sex is loud.
- External ejaculation is expected and common.
- Anal sex is common amongst heterosexual couples.
- Sex is good every time.
- Penises are large (over 6inches)
- Women are expected to dress up and wear make up for sex.

Where to get more help and support:
- Parents and trusted family member, school staff and wellbeing team
- Childline - Helpline: 0800 1111(24 hours) www.childline.org.uk
- CEOPS - www.ceop.police.uk/safety-centre

Contraception

Things to remember
- Contraception refers to the methods that are used to prevent pregnancy from occurring during sexual activity.
- Contraception is a personal choice.
- You may need to try more than one to find out what works best for you.
- You will need to consult your Doctor for most contraceptive methods.
- Contraception is the responsibility of both parties!

METHOD	What is the risk for pregnancy?*	How do you use this method?	How often is this used?	What are menstrual side effects?	Other possible side effects?	Other things to consider?
FEMALE STERILIZATION	.5 out of 100	Surgical procedure	Once	No menstrual side effects	Pain, bleeding, risk of infection	Permanent
MALE STERILIZATION	.15 out of 100					
LNG IUD	.2 out of 100	Placed inside uterus	Up to 8 years	Spotting, lighter or no periods	Some discomfort with placement	No estrogen. May reduce cramps
COPPER IUD	.8 out of 100		Up to 10 years	May cause heavier, longer periods		No hormones. May cause cramps
IMPLANT	.05 out of 100	Placed in upper arm	Up to 3 years	Spotting, lighter or no periods		No estrogen. May reduce cramps
INJECTABLES	4 out of 100	Shot in arm, hip, or under the skin	Every 3 months	Spotting, lighter or no periods	May cause weight gain	No estrogen. May reduce cramps
PILL	8 out of 100	Take by mouth	Every day at the same time	Can cause spotting for the first few months. Periods may become lighter	Nausea, breast tenderness. Risk for blood clots	May improve acne. May reduce menstrual cramps. Lowers ovarian and uterine cancer risk
PATCH	9 out of 100	Put on skin	Weekly			
RING	9 out of 100	Put in vagina	Monthly			
DIAPHRAGM	12 out of 100	Put in vagina with spermicide	Every time you have sex	No menstrual side effects	Allergic reaction, irritation	No hormones
EXTERNAL CONDOM	13 out of 100	Put over penis			Allergic reaction, irritation	No hormones. No prescription
VAGINAL GEL	14 out of 100	Put in vagina			Allergic reaction, irritation	No hormones
WITHDRAWAL	20 out of 100	Pull penis out of vagina before ejaculation	Every time you have sex	No menstrual side effects	No side effects	No hormones. Nothing to buy
INTERNAL CONDOM	21 out of 100	Put in vagina			Allergic reaction, irritation	No hormones. No prescription
SPONGE	24 out of 100	Put in vagina				
FERTILITY AWARENESS-BASED METHODS	24 out of 100	Monitor fertility signs and abstain or use condoms on fertile days	Every day		No side effects	No hormones. Increased awareness of fertility signs
SPERMICIDES	28 out of 100	Put in vagina	Every time you have sex		Allergic reaction, irritation	No hormones. No prescription

MOST EFFECTIVE → MODERATELY EFFECTIVE → LEAST EFFECTIVE

Where to get more help and support:
- Your Doctor, community nurse, or school nurse,
- NHS Online
- www.helathforteensco.uk
- www.brook.co.uk

# Y9 Atomic Structure and the Periodic Table

An **atom** is the smallest part of an element that cannot be broken down chemically.

An **element** is made up of one type of atom and is found in the Periodic Table.

A **compound** consists of 2 or more different types of atoms chemically joined together and are difficult to separate.

A **mixture** is made up of two or more elements **NOT** chemically joined together. They can be separated easily.
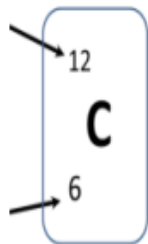
Protons and neutrons are found in the nucleus
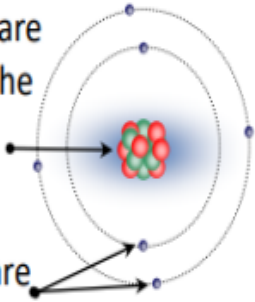
Electrons are found in shells

Particle	Mass	Charge
proton	1	+1
neutron	1	0
electron	almost 0	-1

Properties of metals and non-metals

Metals

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

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**

Diamond   Oxygen   Carbon   silicon   boron

The **relative atomic mass** of an element is an average value that takes account of the abundance of the isotopes of the element.

The **number of electron** is always equal to the **number of protons** for a given element. Atoms have no overall charge.

Atoms are very small. Their radius is 1×10^{-10} m.
The radius of the nucleus is 1/10 000 the size of an atom.

Mass number = Number of protons + neutrons

12

C

6

Atomic number or proton number = Number of protons

Isotopes

Electron shell

Hydrogen-1
mass number: 1

Hydrogen-2, deuterium
mass number: 2

Hydrogen-3, tritium
mass number: 3

Isotopes are different forms of elements that have the **same** number of protons, but **different** number of neutrons.

Keywords

- Periodic Table
- Element
- Groups
- Periods
- Alkali Metals
- Transition Metals
- Halogens
- Noble Gases
- Atoms
- Electrons
- Protons
- Neutrons
- Nucleus
- Electron Shells
- Properties

Y9 Atomic Structure and The Periodic Table

Atomic Model Development

- New experimental evidence and technology may lead to scientific models being changed.
- Before the electron was discovered, atoms were thought to be tiny solid spheres that could not be divided.
- When JJ Thomson discovered the electron, he modified the atomic model to the Plum Pudding Model.
- The Plum Pudding model suggested the atom to be a solid positive sphere with negative electrons embedded throughout it.

Electrons.

Positive material

- Rutherford's Alpha Scattering Experiment led to the conclusion that the mass of an atom is concentrated at the centre (nucleus) and that the nucleus was positively charged.
- The Nuclear Atomic model replaced the Plum Pudding Model.
- Neils Bohr adapted the nuclear model to suggest that electrons were held at specific distances from the nucleus, creating the Planetoid Model.

Electron
Proton
Neutron

- Further experiments identified neutrons as a particle found within the nucleus.
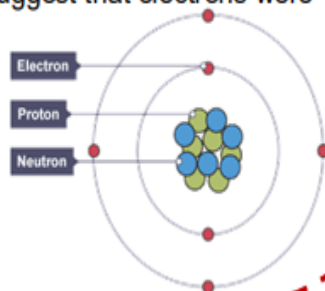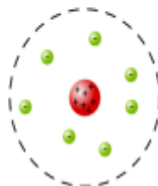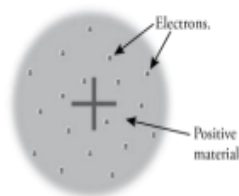
Electron Structure

- Electrons in an atom occupy the lowest available energy level (shell).
- The electronic structure of an atom can be represented by numbers or by a diagram, as shown on the right (Sodium).
- This shows that 2 electrons fill the lowest energy level 8 the second, and one in the third energy level.
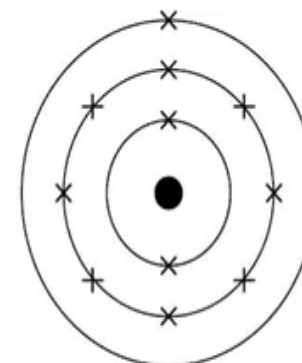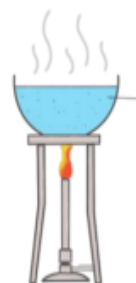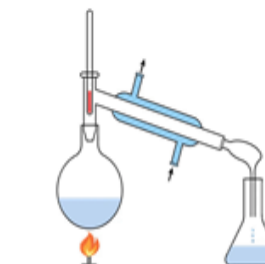
2, 8, 1

Separating Techniques

Mixtures are easily separated by the following physical processes which do not involve chemical reactions, and no new substance is made.
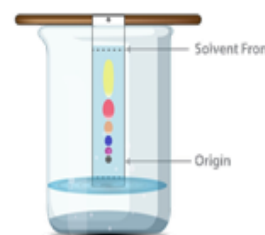
Filter paper
Solid and liquid
Filter funnel
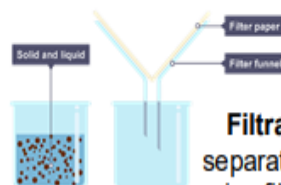
Filtration – separating solid using filter paper

Distillation – separating liquids from liquids based on different boiling points. This can be simple distillation (ink and water) or fractional distillation (crude oil)

Crystallisation – liquid is evaporated leaving a solid crystal

Solvent Front
Origin

Chromatography – separating coloured substances (e.g. food colourings) based on molecular size.

Y9 Atomic Structure and The Periodic Table

The Periodic Table

* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted.

Relative atomic masses for **Cu** and **Cl** have not been rounded to the nearest whole number.

The **Periodic Table** consists of every known element.

- The modern periodic table is arranged according to increasing **atomic number**.
- It is called Periodic Table because similar properties occur at regular intervals (periodically).
- Columns of elements are called **groups** and have the same number of electrons on their outer shell.
- Groups of elements have similar properties.
- Rows of elements are called **periods** and have the same number of electron shells.

Development of the Periodic Table

- Before protons, electrons, and neutrons were discovered, scientists tried to organize the known elements.
- In the early Periodic Tables elements were largely arranged in atomic weight but the tables were largely incomplete (many elements were still undiscovered).
- Some elements were placed in the wrong groups.
- Dimitri Mendeleev overcame some of the problems by leaving gaps where he though undiscovered elements might lay. He also changed the order of some of the elements.

- Elements that Mendeleev predicted were discovered and filled the gaps.
- When isotopes were discovered, they explained why the order of elements was not strictly according to atomic weight but atomic mass.

Y9 Atomic Structure and The Periodic Table

The Periodic Table Properties

Li	Lithium
Na	Sodium
K	Potassium
Rb	Rubidium
Cs	Cesium
Fr	Francium

- **GROUP 1** elements are the **Alkali Metals**
- They have 1 electron on the outer shell, making them all highly reactive.
- Reactivity increases going down the group.

- **GROUP 7** elements are called the **Halogens** and are non-metals.
- They have seven electrons on their outer shell.
- Reactivity decreases going down the group.
- Relative molecular mass, melting and boiling points increase going the group.
- A more reactive halogen can displace a less reactive halogen from an aqueous solution of its salt.

F	Fluorine
Cl	Chlorine
Br	Bromine
I	Iodine
At	Astatine

He	
Ne	
Ar	
Kr	
Xe	
Rn	

- **GROUP 0** are called the **Noble Gases** and a full outer electron shell.
- They are largely unreactive and do not easily form molecules.
- They have 8 electrons on their outer shell, except Helium that has 2.
- The boiling points increase with increasing relative atomic mass (going down the group).

Transition Metals

- The transition metals are the central block of metals on the Period Table, and all have similar properties, which are different to Group 1 metals.
- They do not show group trends like other groups.

Physical Properties

- Good conductors of heat and electricity
- Malleable (can be hammered) and ductile (can be deformed without losing their toughness)
- Very high melting points (except Mercury)
- Usually hard and tough
- High densities

Chemical Properties

- Less reactive than Alkali metals.
- Form coloured ions of different charges.
- Can be very unreactive (e.g. silver, gold, and platinum).
- Many can be used as catalysts.

Y9 Energy Resources

8 Energy Stores

Chemical

Elastic

Gravitational potential

Nuclear

Kinetic

Magnetic

Thermal

Electrostatic

Energies that are always transferred:
Light and Sound

Conservation of Energy

Energy cannot be created or destroyed. Energy can only be **stored**, usefully **transferred**, or **dissipated**.

The total energy before and after a change in a **system** is constant.

A **system** is an object or group of objects where the net energy change is 0J.

Keywords

○ Energy store
○ Transfer
○ System
○ Dissipation
○ Efficiency
○ Biomass
○ Geothermal
○ Energy
○ Insulation
○ Fossil Fuel
○ Renewable
○ Non-renewable
○ Power
○ Work done
○ Temperature
○ Thermometer

Energy Transfers

Energy is transferred when it moves from one store to another. For example, when a ball rolls down a hill, gravitational potential energy transfers to the kinetic energy store.

Reducing unwanted transfers

- Energy that is transferred to the surroundings has been dissipated.
- Insulation, lubrication, sound proofing can all reduce energy dissipation.

SOURCES OF ENERGY

RENEWABLE SOURCES: Biomass energy, Geothermal energy, Wind energy, Hydropower, Solar energy

NON-RENEWABLE SOURCES: Nuclear power, Coal, Natural gas, Fossil fuel oils

Renewable: replenished as quickly as they are used

Non-renewable: Finite resources, will eventually run out.

Y9 Energy Resources

Required Practical 2:

Insulation Material Thickness method:

1: Wrap 2 layers of newspaper around small beaker and use a rubber band to keep it in place. **Do not** cover the bottom.

2: Boil 80cm^3 of water and place into the beaker.

3: Add cardboard lid with hole for thermometer and record starting temperature.

4: Start the timer.

5: Record temperature every 3 minutes for 15 minutes.

6: Repeat steps 2-6 adding 2 layers of newspaper each time to a maximum of 8 layers.

7: Plot graph Temperature (°C) against time (mins).
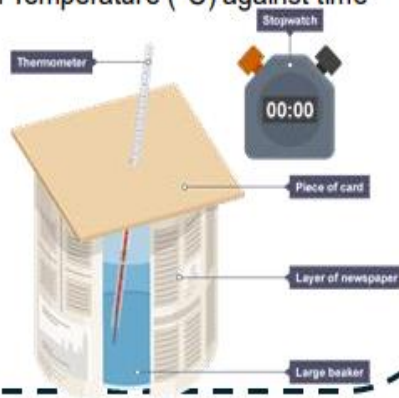
Power

Power is the rate energy is transferred. It is measured in WATTS (W).

$$Power\ (W) = \frac{Energy\ transferred\ (J)}{time\ (s)}$$

$$Power\ (W) = \frac{Work\ done\ (J)}{time\ (s)}$$

Efficiency

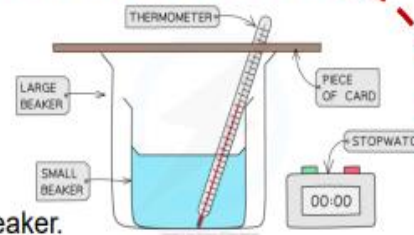The ratio of the useful energy (or power) output from a system to its total energy (or power) input.

$$efficiency = \frac{useful\ energy\ output}{total\ energy\ input}$$

$$efficiency = \frac{useful\ power\ output}{total\ power\ input}$$

Renewable energy resources

Advantages:

- Renewable
- No CO_2 gas released
- Not reliant upon Earth's natural resources

Disadvantages:

- Destroy habitats
- Many are weather dependent (wind, solar)
- Expensive to build and run

Required Practical 1

Insulation Material method:

1: Put small beaker in a large beaker.

2: Boil 80cm^3 water and place in small beaker.

3: Use a cardboard lid with a hole for the thermometer and record the starting temperature.

4: Start the timer.

5: Record temperature every 3 minutes for 15 minutes.

6: Repeat steps 2-6, placing different insulation materials between beakers.

7: Plot graph Temperature (°C) against time (mins).

Non-renewable energy resources

Advantages:

- High energy stored
- Readily available

Disadvantages:

- Releases greenhouse gases (fossil fuels only)
- Finite (will run out)
- Makes Radioactive waste (nuclear only)