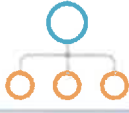


Year 8 Knowledge Organiser Term 1



Choose any of the following activities to complete your homework

	LOOK, COVER, WRITE, CHECK	DEFINITIONS TO KEY WORDS	FLASHCARDS	PICTURES
STAGE 1	Look at & study an area of your knowledge organiser 	Write down the key words & definitions 	Write key words, dates/formulae, equations/quotes on one side & answers on the other 	Draw pictures/diagrams/cartoon strips 
STAGE 2	Cover up your knowledge organiser and write everything you remember 	Cover up the definitions. How many can you remember? Repeat. 	Include pictures or diagrams if it helps. Read through them. 	Label your pictures/diagrams/cartoon strips 
STAGE 3	Check. Correct mistakes in green and add anything you missed. Repeat 	Check. Correct mistakes in green pen. Which ones do you find hard to remember? 	Test yourself and get someone to test you. 	Explain out loud to yourself or family/friend what your images show 
	SELF QUIZZING	MINDMAPS	PAIRED RETRIEVAL	SPEAK, COVER, WRITE, CHECK
STAGE 1	Use your knowledge organiser to create quiz questions. 	Create a mindmap of everything you can remember from your knowledge organiser 	Give a family member/friend the knowledge organiser to hold 	Read out loud the information from the knowledge organiser several times. 
STAGE 2	Write down the answers to your quiz 	Check your knowledge organiser & use a green pen to make any corrections. 	Get them to test you using the knowledge organiser 	Cover up your knowledge organiser and write everything you remember 
STAGE 3	Keep self-quizzing until you get all the answers correct 	Add additional information to your mindmap or make connections to other knowledge 	Write down your answers to their questions 	Check. Correct mistakes in green and add anything you missed. Repeat. 

Dual coding example



LEARN TO STUDY USING...

Dual Coding

COMBINE WORDS AND VISUALS

LEARNINGSIENTISTS.ORG



HOW TO DO IT



Look at your class materials and find visuals. Look over the visuals and compare to the words.



Look at visuals, and explain in your own words what they mean.



Take information that you are trying to learn, and draw visuals to go along with it.

HOLD ON!

Try to come up with different ways to represent the information visually, for example an infographic, a timeline, a cartoon strip, or a diagram of parts that work together.

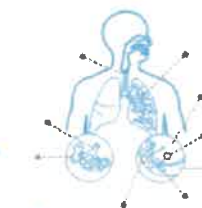
INFOGRAPHIC



CARTOON STRIP



DIAGRAM



GRAPHIC ORGANIZER



TIMELINE



Work your way up to drawing what you know from memory.



RESEARCH

Read more about dual coding as a study strategy

Mayer, R. E., & Anderson, R. B. (1992). The instructive animation: Helping students build connections between words and pictures in multimedia learning. *Journal of Educational Psychology*, 4, 444-452.

Elaboration



LEARNINGSOCIETISTS.ORG

LEARN TO STUDY USING...

Elaboration

EXPLAIN AND DESCRIBE IDEAS WITH MANY DETAILS

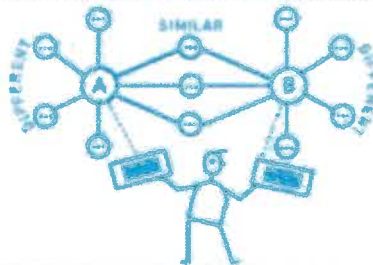


HOW TO DO IT

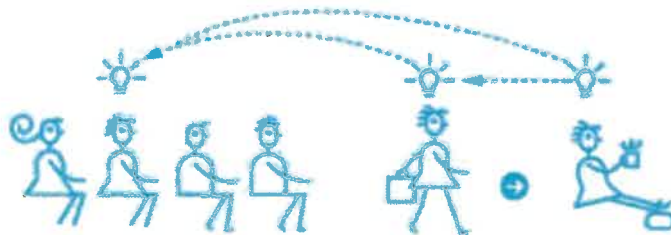
Ask yourself questions while you are studying about how things work and why, and then find the answers in your class materials and discuss them with your classmates.



As you elaborate, make connections between different ideas to explain how they work together. Take two ideas and think of ways they are similar and different.



Describe how the ideas you are studying apply to your own experiences or memories. As you go through your day, make connections to the ideas you are learning in class.



HOLD ON!



Make sure the way you are explaining and describing an idea is accurate. Don't overextend the elaborations, and always check your class materials or ask your teacher.



Work your way up so that you can describe and explain without looking at your class materials.

RESEARCH

Read more about
elaboration
as a study strategy

McDaniel, M. A., & Donnelly, C. M. (1996). Learning with analogy and elaborative interrogation. *Journal of Educational Psychology, 88*, 508-519.

Wong, B. Y. L. (1985). Self-questioning instructional research: A review. *Review of Educational Research, 55*, 227-268.



LEARN TO STUDY USING...

Interleaving

SWITCH BETWEEN IDEAS WHILE YOU STUDY

LEARNHOWSCIENTISTS.ORG



HOW TO DO IT

Switch between ideas during a study session. Don't study one idea for too long.



Go back over the ideas again in different orders to strengthen your understanding.

TOPICS
A B C



STUDY
SESSION
1

TOPICS
C B A



STUDY
SESSION
2

TOPICS
A C B



STUDY
SESSION
3

Make links between different ideas as you switch between them.



HOLD ON!



While it's good to switch between ideas, don't switch too often, or spend too little time on any one idea; you need to make sure you understand them.



Interleaving will feel harder than studying the same thing for a long time. But don't worry - this is actually helpful to your learning!

RESEARCH

Read more about
interleaving
as a study strategy

Rohrer, D. [2012]. Interleaving helps students distinguish among similar concepts. *Educational Psychology Review*, 24, 355-367.

KNOWLEDGE ORGANIZER – YEAR 8 ART

Tropical Landscapes

EXAMPLES OF FINAL OUTCOMES:

YOU WILL LEARN:

skills to produce a tropical landscape painting inspired by Henri Rousseau. You will make use of composition and layering while using paper cutting to develop the foreground.

WHY AM I LEARNING THIS?

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

CONTEXTUAL KNOWLEDGE:

Henri Rousseau

Salvador Dali



Rousseau's favourite subject was the jungle, but he never actually saw a jungle. He based his scenery on the botanical gardens in Paris and the animals were drawn from guide books and zoo pamphlets.

Salvador Dali

Dali was a Spanish surrealist artist known for the striking and bizarre images in his work.



How to create paper leaves:

<https://www.youtube.com/watch?v=8L6Pv4dnyg>

Video animation of Henri Rousseau's artwork:

<https://www.youtube.com/watch?v=6W6b2dK9w>

HOW WELL AM I DOING?

The relationship of one part of a whole to other parts.

The lightness or darkness of something – this could be shade, or how dark or light a colour appears.

The arrangement of elements within a work of art.

A shape is an area enclosed by a line. It is 2 dimensional and can be geometric or organic.

Forms are 3 dimensional shapes. They occupy space, like people!

An art movement producing fantastic imagery or effects by unnatural or irrational combinations.

HOMEWORK TASKS:

Tick when complete

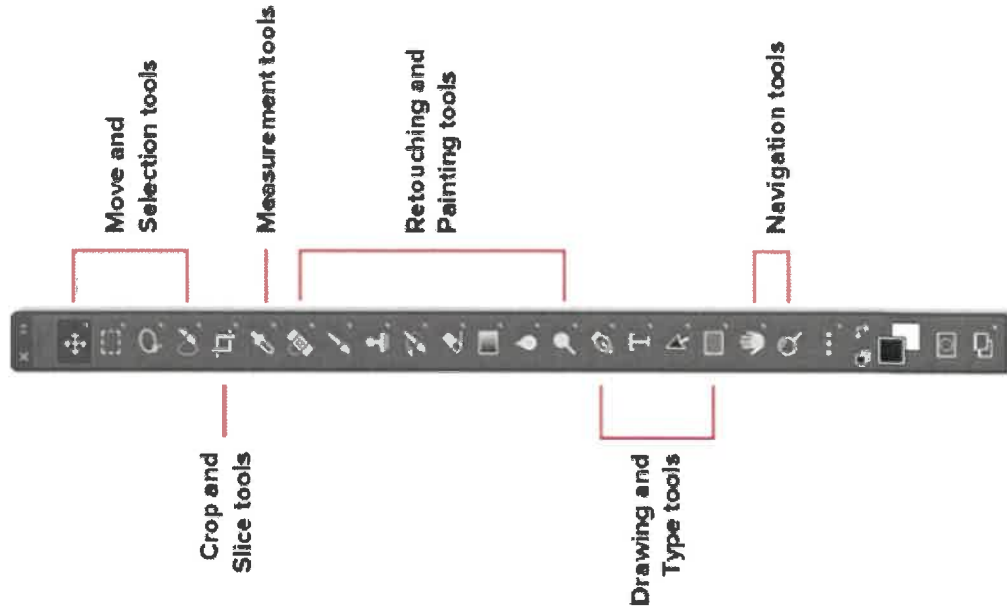
1. Tonal leaf drawing.
2. Draw a tree showing tone and texture.
3. Observational drawing of a plant in a pot.
4. Research Salvador Dali.
5. Research Rene Magritte.
6. Copy a Rousseau animal using oil pastels.

My Progress

Name:	Project: Year 8 Tropical Landscapes	Target grade:
	Targets	Done EG
	Develop accuracy with colour mixing and directional marks for texture	
	Explore the Sgraffito and wax resist techniques to develop the background foliage	
	Create a full-page copy of a Rousseau animal in oil pastel	
	Annotate to evaluate your work and to explain the Rousseau links- use key words	
	Use mixed media in your final outcome showing skilful application of materials and paper folding techniques like origami	
	Develop accuracy for foliage and leaf shapes in the foreground	
	Practice mixing your pigments to create more accurate colours	
	Create a 3 layered composition using paint and mixed media	
	Develop a clear and successful composition plan	
	Present the information on Rousseau on a full page in your book with a title and images	
	End of project grade	

Teacher comments:

Photoshop Tools Layout



Year 8 – Photoshop

Move Tool	used to move items around
Marquee Tool	used to make selections. There are four different types which are: Rectangular - This will make a Rectangular selection Elliptical - This will make a Elliptical selection SingleColumn - This will make a Column selection SingleRow - This will make a Row selection
Lasso	used to make selections. There are three different types which are: Lasso - This can make free hand selection PolygonalLasso - This will make selection with lines MagneticLasso - This will make selection by shaping onto objects.
Quick Selection	used to make selection of objects by painting on them with an adjustable brush.
Crop	used to trim images.
Eraser	used to erase pixels of an image.
Brush Tool	Paints a brush stroke.
Pencil Tool	Paints are hard-edge stroke.
Gradient	This tool can be used to make a straight-line, radial, angle, reflected, and diamond blends between colors.
Paint Bucket	Fills similar coloured areas with the foreground colour
Pen	This tool can be used to create smooth-edged paths. You can use the Freeform Pen to create paths free-handed.
Type Tool	creates a text box which can be used to type text into.
Shape Tools	used to create shapes. There are six different types of shape tools which are: Rectangle Rounded Rectangle Ellipse Polygon Line Custom Shape
Hand	This tool can be used to move an image within the window.
Zoom	Zoom In and out.
Magic Wand tool	Selects the pixels with similar colors in a single click
Spot Healing Brush tool	Removes spots from your photos
Clone Stamp tool	Paints with an image sample, which you can use to duplicate objects, remove image imperfections, or paint over objects in your photo
Dodge tool	Lightens areas of an image. You can use the tool to bring out details in shadows
Burn tool	Darkens areas of the image. You can use the tool to bring out details in highlights
Eye tool	Removes the red eye effect, pet eye effect, and corrects closed eyes in your photos.

Drama – Year 8 Term 1

COMMEDIA DELL ARTE

For GCSE drama, you need to understand and be able to apply techniques from different genres of performance. This genre is COMEDY

Background

Form of theatre that originated in Italy in the 16th Century
Based on improvised scenes of LAZZIS
All characters would “Clock the audience” before their performance started

Most characters wore masks

The same STOCK characters were in each performance
There was lots of audience interaction

The pieces were performed outside, often in busy towns
There were very few props or scenery
There was lots of stage fighting

Sound effects were key

Women could not be in any performances

It is believed to be the origin of COMEDY



How can you create humour without the use of words?

Why was it important that the characters had specific masks?

How would you mark the moment of Arlechinno freezing time?

Characters

ARLECHINNO- Acrobat, servant character, able to stop time. In love with COLUMBINA, Pick Pocket, long – pointy nose mask. Character centre - NOSE



COLUMBINA- Female character, large chest, no mask, flirty, often slapped male characters.
Character centre - CHEST



IL DOTTORE- Drunk, “doctor” character, slurred words together, extremely fat, wore a mask and red cheeks. Character centre - TUMMY



PANTELONE- Master or ARLECHINNO, in love with COLUMBINA, flirty and over friendly, loves money.
Character centre - GROIN



Why were there few props / scenery?

What is a STOCK CHARACTER?

What role do sound effects play in this genre?



KS3 YEAR 8 D&T RESISTANT MATERIALS

Tools and Equipment

Measuring and marking

Steel rule



An accurate tool for measuring and marking out

Try square



A tool used to check right angles on wood or plastic

Template



A template is a tool used to mark out shapes repeatedly

Jig



A tool used to control the location and/or motion of another tool

Shaping and finishing

Metal file



Used to shape or smooth wood, metal or plastic

Glass paper



An abrasive paper used to smooth the surface or edges of wood

Disc sander



A machine used to smooth the edges of materials

Traditional wood joints:

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

Maths in DT:

Multiplication
Divide
Add / Subtract
Measurement conversion
Ratios
Percentages
Surface area

Mechanical Devices

Motion

LINEAR MOTION

ROTARY MOTION

RECIPROCATING MOTION

OSCILLATING MOTION

Linkages

Reverse Motion Linkage

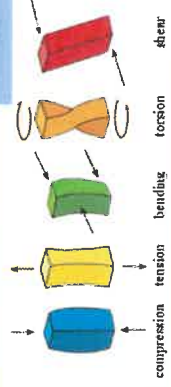
Parallel Motion Linkage

Back Motion Linkage

Gears



Forces

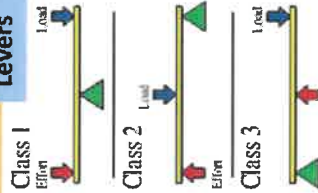


Lever

Class 1

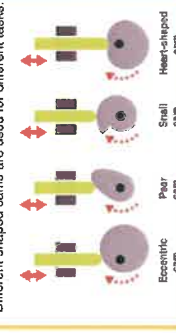
Class 2

Class 3

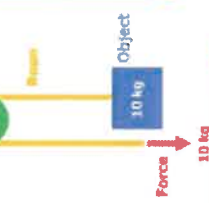


Types of cams

Different shaped cams are used for different tasks:



Cams



2 point perspective

Cutting

Tenon saw



A hand saw with a stiff back used to cut straight lines in wood – back saw action

Coping saw



A hand saw used to cut complex shapes in wood and plastic

Scroll saw



A machine saw used to cut complex shapes in wood and plastic

Bench hook



Held against the front edge of a bench or table to support work

Pillar drill



A machine used to make holes in materials

Chisel



Used for carving or cutting a hard material such as wood, stone, or metal by hand

Laser cutter



CAM: Laser cutting is the use of a high-powered laser to cut, etch and engrave your material

Traditional wood joints:

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

What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Keywords

Research
Design
Evaluation
Wood joint
Mechanical
Pulley
Linkage
Lever
Motion
Force

Health and Safety in DT:

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



KS3 YEAR 8

DT TEXTILES

Tools and Equipment	
Measuring and marking	
Measuring Tape	Fabric tape measure used to measure
Tailor's chalk	A temporary mark on fabric
Template / Pattern	A template / pattern is a tool used to mark out shapes repeatedly
Constructing	
Sewing needle	Helps to sew fabric together
Embroidery needle	A needle with a larger eye to accommodate embroidery thread
Sewing machine	Machine sews fabric together
Pins	A temporary method to hold fabric in place
Tacking stitch	A temporary stitch to hold fabric together

Types of

Seams:

Plain
French
Flat felled
Bound
Lapped

Maths in DT:

Multiplication
Divide
Add / Subtract
Measurement conversion
Ratios
Percentages
Surface area

Textiles Dyes:

Natural Dyes

- Plants
- Food / spices
- Grass / tree bark / leaves
- Onions / beetroot
- Cochineal

Chemical Dyes

Dyes which are man-made using chemicals: consistent and vibrant.

Fibre Categories:

Natural Fibres

Plant based natural fibres:

- Cotton
- Linen
- Flax
- Coir (coconut)

Animal based natural fibres:

- Wool
- Angora
- Silk

Man-made Fibres

- Polyester
- Acrylic
- Nylon

Fabric Construction:

Woven
Knitted
Bonded

Keywords

Islamic
Religion
Design
Product analysis
Research
Evaluation
Stitch
Scissors
Sewing machine
Customer
Environment
Function
Material
Seam allowance
Hem
Tie-Dye
Printing
Tessellate
UCD
Mordant

Cutting	
Fabric shears	Scissors used for cutting fabric
Thread scissors	Scissors used for cutting thread
Stitch ripper	Used for removing sewn stitches from fabric
Pinking shears	Creates a zig zag cut edge for decoration to prevent fraying
Adding Colour	
Tie-dye	A type of resist dye
Batik	A type of resist dye which uses wax
Block Printing	Engraved wooden blocks to produce repeat patterns
Fabric paint / pens	Paint / pens which can be applied to fabrics

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



Health and Safety in DT:

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

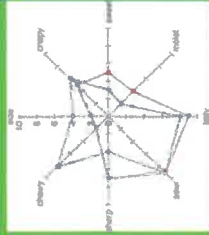
What is good design?

Clear ideas
Annotations
Measurements
Content
Presentation
Balance

Year 8 Food Knowledge Organiser.

Sensory Analysis

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



Discrimination testing These are used to detect differences between two or more products.

Hedonic testing

These are used to see how much we like the products

Health and Safety Rules in our Kitchen

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

Food Hygiene

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



Healthy eating

What happens if we eat too much fat:

- Weight gain, Obesity
- Heart disease
- Type 2 diabetes

What happens if we eat too much sugar:

- Tooth decay
- Weight gain – obesity

What happens if we eat too much salt:

- Raised blood pressure
- Increased risk of heart disease and stroke

What happens if we don't eat enough fibre:

- Helps digestion and prevents constipation
- lower risk of heart disease, stroke, Type 2 diabetes and bowel cancer

Keywords

- Raising agent
- Obesity
- Type 2 diabetes
- Nutrients
- Balanced diet
- Provenance
- Coronary heart disease
- Conduction
- convection
- Hedonic testing

Practical

- Pasta bake
- Turkey burgers
- Chocolate brownies
- Pasta/rice salad
- Pineapple upside down cake
- Pizza
- croissants

Conduction
Energy is transferred by direct contact



Convection
Energy is transferred by the mass motion of molecules



Radiation
Energy is transferred by electromagnetic radiation



Washing Up Routine



Food provenance

Food that is grown, food that is caught, food that is reared.



EatWell Guide

The eatwell guide shows us how much of what we eat should come from each food group. What other information can you see that will help us make healthy choices?



FIGURATIVE LANGUAGE DEFINITIONS

Personification: the attribution of a personal nature or human characteristics to something non-human, or the representation of an abstract quality in human form.

Metaphor: a metaphor is a figure of speech that describes an object or action in a way that isn't literally true, but helps explain an idea or make a comparison.

Simile: a comparison using 'like' or 'as'.

Alliteration: the occurrence of the same letter or sound at the beginning of adjacent or closely connected words.

Onomatopoeia: words that sound like the noise they describe.

Hyperbole: Exaggeration.

FEELINGS AND EMOTIONS



WORD CLASSES – TYPES OF NOUN

Common Nouns refer to people, places, things, or ideas in general terms.

Proper nouns refer to specific people, places or things.

Concrete nouns are nouns that refer to things that exist physically and can be touched, seen, smelled, felt, or tasted.

Abstract nouns refer to concepts or feelings that cannot be experienced concretely or touched physically.

Collective nouns refer to a group.

WORD CLASSES

Nouns are naming words. There are different categories of noun.

A **pronoun** is a word that replaces a name.

A **verb** is a word used to describe an action, state, or occurrence.

An **adverb** is a word or phrase that modifies or qualifies an adjective, verb, or other adverb or a word group, expressing a relation of place, time, circumstance, manner, cause, degree, etc.

An **adjective** is a word that describes a noun or pronoun.

A **conjunction** is a word or phrase whose function is to link other linguistic units.

Prepositions are words that connect people, objects, time and location.

USEFUL DEFINITIONS

Rhythm: the beat and pace of a poem.

Rhyme: the correspondence of two or more words with similar-sounding final syllables placed so as to echo one another.

Form: the overarching structure or pattern of the poem – how it looks on the page.

Structure refers to what the poem is made up of, how it is presented to the reader, and the technical aspects, like line length and rhyme scheme.

Enjambment: the continuation of a sentence without a pause beyond the end of a line, couplet, or stanza.

Stanza: a stanza usually is a group of lines arranged together.

Open form: a structure that doesn't have to follow traditional or specific patterns.

Closed form: poems written in specific patterns

Connotation: the meaning created by association.

Denotation: the literal or primary meaning of a word, in contrast to the feelings or ideas that the word suggests.

Inference: Using observation to reach a conclusion.

Action: the process of doing something.

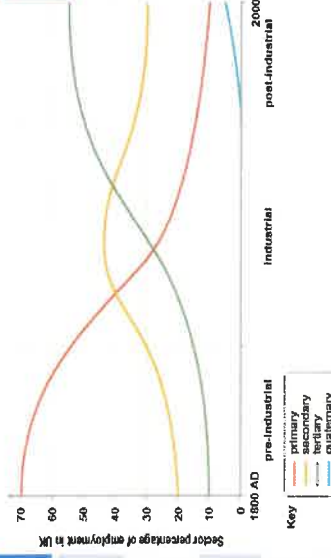
Punctuation: the marks, such as full stop, comma, and brackets, used in writing to separate sentences and their elements and to clarify meaning.

Narrator: A narrator is the person from whose perspective a story is told

Semantic field: words related in meaning.

The 4 types of economic activity

Primary	Taking raw materials from the ground or sea. E.g farmers and fishermen
Secondary	Make products from the raw materials. E.g. Factory workers or construction
Tertiary	Providing a service for other people E.g. Teachers or doctors
Quaternary	High-Tech research and developing new goods E.g. Vaccine creation.



Why jobs change over time

Technology	Inventions in farming and fishing has meant that far fewer people are needed to farm and fish, therefore the primary industry has decreased. Mechanisation and the use of robots in factories has meant that fewer workers are needed in factories therefore can cause a fall in % of secondary workers The internet has transformed the tertiary industry with many new ways of working therefore the % of tertiary jobs is always increasing.
Globalisation	Globalisation means that factories can open in countries far away where workers work for less so secondary jobs can increase in those countries but decrease in rich countries. This is why so many products are "made in China" Huge container ships mean that it is very easy and cheap to transport goods around the world. This helps companies set up factories in Low Income Countries (where the cost of labour is cheaper) instead of High Income Countries.

How types of jobs vary between countries

Low income countries (LIDCs)	As there is still minimal industry and technology in LIDCs, primary jobs such as farming dominate.	
Emerging countries (EDCs)	Industrialisation is significant in these countries, as a result there is an increase in both secondary and tertiary and a decrease in primary	
Advanced countries (ACs)	Commercialisation and technology is dominant in ACs, as a result there are many tertiary jobs and a growth in quaternary jobs	

Year 8 Geography: What job will you do?

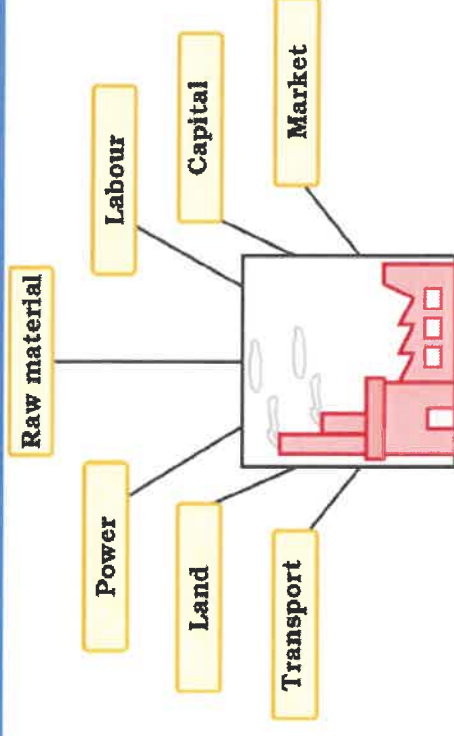
Jobs in the future?

You may find yourself in the "**Gig Economy**". This is **where** you use an online platform to find short jobs rather than longer ones. Each job is a **gig**.

Jobs associated with **climate change** are predicted to grow as more jobs will be created by manufacturing "greener products".

Technology will ensure that you might apply for jobs that don't exist yet. A professional "Youtuber" didn't exist 10 years ago.

What do you think about when locating an industry?



Locational factors for industries

How globalisation affects jobs: What is a TNC

A TNC is a transnational company that sells or makes its products in more than one country. Most products you now buy are made or sold by TNCs. At some point in your life, you are likely to work for a TNC.



How globalisation affects jobs

Losers	Winners
People lose jobs because UK factories close down. People lose jobs as their companies can't keep up with foreign imports. Countries can become reliant on imports.	Holiday destinations are cheaper and more exciting. More jobs are available as TNCs create more jobs. You can purchase goods significantly cheaper

Enquiry: What was the impact of the slave trade?

Outline: Between the 16th and 19th centuries , European merchants transported an estimated 12.5 million Africans across the Atlantic to work in slavery in the Americas. Unknown millions died as a result.

Date	Event	Description
1562	Start of the slave trade	Sir John Hawkins was given permission by Elizabeth I to begin transporting captured Africans to America. There they were sold
1781	Zong massacre	The killing of 133 African enslaved people by the crew of the British slave ship Zong. They were thrown overboard so that the ship owner could claim compensation from his insurance.
1804	Haitian revolution	Haiti was named by enslaved people who rebelled against their masters led by Toussaint Louverture.
1807	UK abolished the slave trade	After a long campaign by many different people, the British parliament voted to end Britain's active participation in the slave trade.
1833	Slavery abolished in the British Empire	Britain stopped slavery in the lands under their control around the world. Compensation was agreed for slave owners for their loss of income.
1865	End of slavery in the USA	President Lincoln freed all enslaved people in the USA after the end of the American Civil War where the North had won.

Furthering learning
Want to find out more about the slave trade?



Historical skill focus: using evidence

Does the source match our own knowledge?
How USEFUL are the sources?
What is the purpose?

History – Year 8 Knowledge Organiser Topic 1

Key individuals



Olaudah Equiano bought his freedom and then campaigned to end slavery for others.



Harriet Tubman. Escaped from slavery and then risked her life to free 300 other enslaved people on the Underground Railroad



Toussaint Louverture. Led a successful rebellion of enslaved people in Haiti.



Abraham Lincoln. US president who freed enslaved people after the American Civil War.

Prior learning?

Y7: colonisation unit on the start of the British Empire

Key vocabulary:

Abolition: the ending of the slave trade when it was abolished.

Abolitionist: someone who campaigned to end slavery.

Auction: a market to sell goods to the highest bidder.

Branding: to mark a person or animal with a hot iron to show ownership.

Cargo: goods that are being transported to be traded.

Dehumanise: the process where people are treated as though they are less than human, for example taking away their names and splitting up families.

Middle Passage: the crossing over the Atlantic that enslaved people took from Africa to America.

Plantation: a farm where enslaved people worked to grow crops like sugar or coffee.

Shackles: iron chains used to control enslaved people and make it more difficult to run away

Triangular trade: A three part trading journey. 1. European ships took cloth, guns, iron pots, swords to Africa and exchanged them for people. 2. Ships loaded with people crossed the Atlantic to America where they were sold. 3. Ships loaded with sugar, cotton, tobacco returned to Europe.

Underground railroad: a secret organisation that helped enslaved people to escape from the South to the North in the USA.

TRIANGULAR TRADE



Year 8 - Proportional reasoning...

Ratio and Scale

What do I need to be able to do?

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

- Simplify any given ratio
- Share an amount in a given ratio
- Solve ratio problems given a part

Solutions should be modelled, explained and solved

Keywords

Ratio: a statement of how two numbers compare

Equal Parts: all parts in the same proportion, or a whole shared equally

Proportion: a statement that links two ratios

Order: to place a number in a determined sequence

Part: a section of a whole

Equivalent: of equal value

Factors: integers that multiply together to get the original value

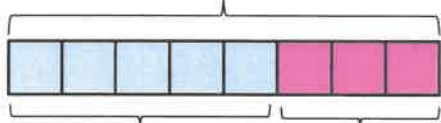
Scale: the comparison of something drawn to its actual size.



Representing a ratio

"For every 5 boys there are 3 girls"

This is the "whole" — boys and girls together



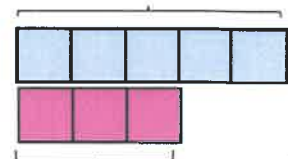
This represents the 5 boys

This represents the 3 girls

5:3

This represents the 5 boys

Double Number Line



This is the "whole" — boys and girls together

This represents the 3 girls

Order is Important

"For every dog there are 2 cats"



Dogs: Cats



1:2

The ratio has to be written in the same order as the information is given.

e.g. 2:1 would represent 2 dogs for every 1 cat. ✗

Simplifying a ratio

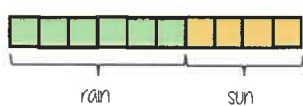
Cancel down the ratio to its lowest form

"For every 6 days of rain there are 4 days of sun"

6:4

+ by 2

3:2



rain

sun

Find the biggest common factor that goes into all parts of the ratio

For 6 and 4 the biggest factor (number that multiplies into them is 2)

"For every 3 days of rain there are 2 days of sun" — when this happens twice the ratio becomes 6:4

Ratio In (or n:1)

This is asking you to cancel down until the part indicated represents 1

Show the ratio 4:20 in the ratio of 1:n

The question states that this part has to be 1 unit. Therefore Divide by 4

4:20
1:5

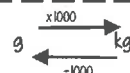
This side has to be divided by 4 too — to keep in proportion

*If the n part does not have to be an integer for this type of question

Units are important:

When using a ratio — all parts should be in the same units

Useful Conversions



Sharing a whole into a given ratio

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

Model the Question

James: Lucy

3:4

James



Lucy



£350

£350 ÷ 7 = £50

□ = one part = £50

Find the value of one part

Whole: £350

7 parts to share between (3 James, 4 Lucy)

Put back into the question

James: Lucy

(x50 3:4 x50)
£150:£200

James = 3 x £50 = £150



£350

Lucy = 4 x £50 = £200

Finding a value given In (or n:1)

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

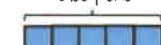
Model the Question

Blue: Red

5:1

□ = one part = 10 pens

Blue pens



Red pens

One unit = 10 pens

Put back into the question

Blue: Red

(x10 5:1 x10)
50:10

Blue pens = 5 x 10 = 50 pens



Red pens = 1 x 10 = 10 pens

There are 50 Blue Pens

Ratio as a fraction



Trees: Flowers

3:7

Trees



Ratio

Flowers

There are 3 parts for trees

Fraction of trees

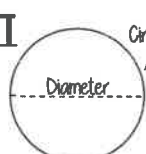
Number of parts of in group
Total number of parts

3
10

Fraction

Tree parts 3 + Flower parts 7 = 10

PI II



Circumference

The ratio of a circles circumference to its diameter

Year 8 - Proportional reasoning...

Multiplicative Change

What do I need to be able to do?

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

- Solve problems and explain direct proportion
- Use conversion graphs to make statements, comparisons and form conclusions
- Understand and use scale factors for length

Keywords

Proportion: a statement that links two ratios

Variable: a part that the value can be changed

Axes: horizontal and vertical lines that a graph is plotted around

Approximation: an estimate for a value

Scale Factor: the multiple that increases/ decreases a shape in size

Currency: the system of money used in a particular country

Conversion: the process of changing one variable to another

Scale: the comparison of something drawn to its actual size.

Direct Proportion

As one variable changes the other changes at the same rate



4 cans of pop = £2.40

$\times 0.5$
4 cans of pop = £2.40
 $\times 0.5$
2 cans of pop = £1.20

This is a multiplicative change

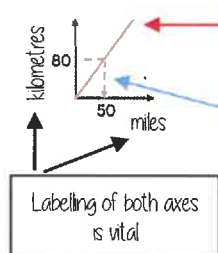
4 cans of pop = £2.40
 $\times 3$
12 cans of pop = £7.20

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

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

Conversion Graphs

Compare two variables



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

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

Conversion between currencies

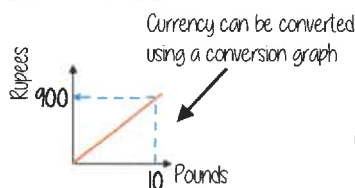


£1 = 90 Rupees

Currency is directly proportional

For every £1 I have 90 Rupees

£1 = 90 Rupees
 $\times 10$
£10 = 900 Rupees



Currency can be converted using a conversion graph

Convert 630 Rupees into Pounds

£1 = 90 Rupees
 $\times 7$
£7 = 630 Rupees
 $630 \div 90 = 7$

Ratio between similar shapes



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

The two rectangles are similar.

3 m 8 m

4.5 m ? m

Corresponding sides

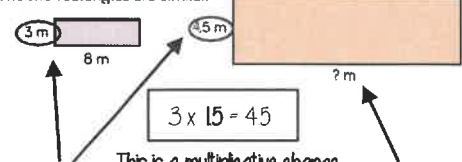
$\frac{3\text{m}}{1\text{m}} = \frac{4.5\text{m}}{1.5\text{m}}$

$\frac{8\text{m}}{1\text{m}} = \frac{12\text{m}}{1.5\text{m}}$

Note
Simplify to the same ratio

Understand Scale Factor

The two rectangles are similar.

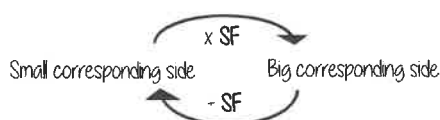


This is a multiplicative change

Use corresponding sides to calculate a scale factor

Scale factor can also be calculated by

Bigger corresponding side
Smaller corresponding side



Draw and interpret scale diagrams

A picture of a car is drawn with a scale of 1:30

For every 1cm on my image is 30cm in real life

The car image is 10cm

Image Real life
1cm 30cm
 $\times 10$
10cm 300cm

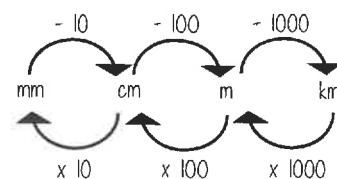


The car in real life is 210cm

Image Real life
1cm 30cm
 $\times 7$
7cm 210cm



Interpret maps with scale factors



1 cm : 250 m

Ratios need to be in the same units

1 cm : 250m

1 cm : 25000cm

$250 \times 100 = 25000$

For every 1cm on my map is 25000cm in real life



Year 8 - Proportional reasoning...

Multiplying and Dividing Fractions

What do I need to be able to do?

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

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

Keywords

Numerator: the number above the line on a fraction. The top number. Represents how many parts are taken

Denominator: the number below the line on a fraction. The number represents the total number of parts.

Whole: a positive number including zero without any decimal or fractional parts.

Commutative: an operation is commutative if changing the order does not change the result.

Unit Fraction: a fraction where the numerator is one and denominator a positive integer.

Non-unit Fraction: a fraction where the numerator is larger than one.

Dividend: the amount you want to divide up.

Divisor: the number that divides another number.

Quotient: the answer after we divide one number by another e.g. dividend ÷ divisor = quotient

Reciprocal: a pair of numbers that multiply together to give 1.



Representing a fraction

Numerator

Denominator

Number of parts represented

Numerator

$$\frac{3}{5}$$

Number of parts to make up the whole
Denominator

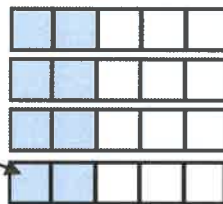
ALL PARTS of a fraction are of equal size

Repeated addition = multiplication by an integer

$$4 \times \frac{2}{5} \rightarrow \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5}$$

Integer
(Whole number)

Each part
represents $\frac{1}{5}$

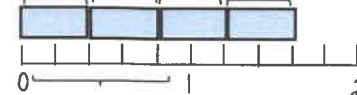


How many parts are shaded?

What each part represents

$$= \frac{8}{5} \leftarrow \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5}$$

$$= 1 \frac{3}{5}$$



Each whole is split into the same number of parts as the denominator

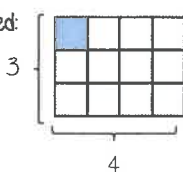
Revisit
When adding fractions with the same denominator = add the numerators

Multiplying unit fractions

$$\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$$

Parts shaded

Modelled:



Total number of
parts in the diagram

Multiplying non-unit fractions

Shade in 3
parts

Repeat it
on this
many rows

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

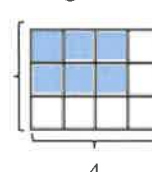
This many columns

This many rows

$$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$$

Parts shaded

Modelled:



Total number of
parts in the diagram

Quick Multiplying and Cancelling down

$$\frac{1}{3} \times \frac{4}{9} = \frac{4}{27}$$

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

Quick Solving

Multiply the numerators
Multiply the denominators

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

The reciprocal

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

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

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

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

Reciprocals for division

$$\begin{aligned} \text{e.g. } 5 \div \frac{1}{4} &= 20 \\ 5 \times 4 &= 20 \end{aligned}$$

Multiplying by a reciprocal gives the same outcome

Dividing an integer by a unit fraction



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

How many quarters are in 1?

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

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

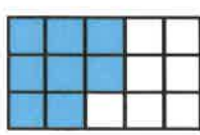
Dividing any fractions

Remember to use reciprocals

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

Multiplying by a reciprocal gives the same outcome

Represented



$$= \frac{8}{15}$$

Les vacances en famille • Family holidays

Tous les ans ...	Every year ...
Normalement ...	Normally ...
nous allons ...	we go ...
en France	to France
en Espagne	to Spain
en Grèce	to Greece
en Italie	to Italy
aux États-Unis	to the USA
au Portugal	to Portugal
à la mer	to the seaside
à la montagne	to the mountains
à la campagne	to the countryside
Nous allons au restaurant.	We go to a restaurant.
Nous visitons des monuments.	We visit monuments.
Nous faisons du camping.	We go camping.
Nous faisons de la randonnée.	We go hiking.
Nous faisons de la natation.	We go swimming.
Nous faisons des activités sportives.	We do sports activities.
Nous restons en France.	We stay in France.

Je me prépare • I get myself ready

Je me douche.	I have a shower.
Je me fais une crête.	I make my hair spiky.
Je me parfume.	I put on perfume/ aftershave.
Je m'habille.	I get dressed.
Je me brosse les cheveux.	I brush my hair.
Je me lave les dents.	I clean my teeth.
Je me regarde dans la glace.	I look in the mirror.
Je me rase.	I shave.
Je me maquille.	I put on make-up.

Les nombres et l'argent • Numbers and money

quarante	40
quarante-cinq	45
cinquante	50
cinquante-cinq	55
soixante	60
soixante-cinq	65
soixante-dix	70
soixante-quinze	75
quatre-vingts	80
quatre-vingt-cinq	85
quatre-vingt-dix	90
quatre-vingt-quinze	95
Tu as combien d'argent?	How much money have you got?
J'ai dix euros cinquante.	I've got ten euros fifty (cents).

Au café • At the café

J'ai faim/ j'ai soif.	I'm hungry and I'm thirsty.
Vous désirez?	What would you like?
Je voudrais ...	I'd like ...
un café	a black coffee
un café-crème	a white coffee
un thé (au lait/au citron)	a tea (with milk/lemon)
un chocolat chaud	a hot chocolate
un coca	a cola
un jus d'orange	an orange juice
un Orangina	an Orangina
une limonade	a lemonade
un sandwich au fromage	a cheese sandwich
un sandwich au jambon	a ham sandwich
un croque-monsieur	a toasted cheese and ham sandwich
une crêpe	a pancake
une glace (à la vanille/ à la fraise/au chocolat)	a (vanilla/strawberry/ chocolate) ice-cream

Qu'est-ce que tu vas faire? • What are you going to do?

Pendant les vacances ...	During the holidays ...
je vais ...	I'm going to ...
aller à la pêche	go fishing
danser	dance
faire de l'accrobranche	do treetop adventures
faire du karaoké	do karaoke
faire de la voile	go sailing
faire de la planche à voile	go windsurfing
nager dans la mer	swim in the sea
rester au lit	stay in bed
retrouver mes copains/ copines	get together with my mates

Quels sont tes rêves? • What are your dreams?

Je voudrais aller ...	I'd like to go ...
à Paris	to Paris
en Australie	to Australia
au Canada	to Canada
aux États-Unis	to the USA
Je voudrais ...	I'd like ...
être footballeur professionnel	to be a professional football player (masculine)
être danseuse professionnelle	to be a professional dancer (feminine)
habiter dans une grande maison	to live in a big house
avoir une voiture très cool	to have a really cool car
faire le tour du monde	to travel around the world
rencontrer mon acteur/ mon actrice préféré(e)	to meet my favourite actor/actress

Les mots essentiels • High-frequency words

pendant	during
combien (de)?	how much?/how many?
à	to/in (+ town)
en	to/in (+ feminine country)
au	to/in (+ masculine country)
aux	to/in (+ plural country)
d'abord	first
ensuite	next
puis	then
finalement	finally
quelquefois	sometimes



Stratégie 5

Letter and sound patterns

Just as in English, many French words contain the same letter patterns. Recognising these patterns will help you to spell and say more words correctly. You have practised some of these throughout Studio. One way of remembering these is to write lists of words with identical letter patterns. Add to them as you come across more. Here are some from Module 5 to start you off:

montagne
campagne
soif
voile
footballeur
danseur

Learning methods: Choose from below or use your own ideas. Show your teacher what you have done.

1. Create a collage of 10 vocab items and meanings
3. Design 'memes' for at least 10 of the vocab items
4. Produce flashcards for at least 10 items of vocab
5. Write a quiz of at least 15 questions where the answers are vocab items

Regular -er verbs in the present tense

rester	je reste	I stay
tu restes	you stay (singular, informal)	
il/elle/on reste	he/she stays/we stay	
nous restons	we stay	
vous restez	you stay (plural/formal)	
ils/elles restent	they stay	

- 1 Find all the parts of *jouer* (to play) and match them with the English.
Example: 1 je joue

je joue
tu joues
il/elle/on joue
nous jouons
vous jouez
ils/elles jouent

- 2 Complete each sentence by selecting the correct form of the verb.
- 1 Il **mange**/manger un sandwich.
 - 2 J'**écoute**/écoute de la musique.
 - 3 Vous **désirez**/désirez?
 - 4 Tu **restes**/restent au lit.
 - 5 Elles **dansent**/dansent.
 - 6 Elle **aime**/aimez les vacances.
 - 7 Nous **jouons**/jouent au volley.
 - 8 On **adore**/adore le reggae.

- 1 I play
- 2 you play (informal)
- 3 he plays
- 4 she plays
- 5 we play (x 2)
- 6 you play (formal)
- 7 they play (masc)
- 8 they play (fem)

Using nous in the present tense

For -er verbs, the ending for **nous** is -ons.

Irregular verbs: **nous allons** we go **nous faisons** we do

- 3 Replace the verbs in brackets with the correct form.

allons

Normalement, nous 1 (**aller**) en Italie. Nous 2 (**aller**) à la campagne.

Nous 3 (**aimer**) pique-niquer, mais quelquefois, nous 4 (**aller**) au restaurant.

Nous 5 (**visiter**) des monuments et nous 6 (**faire**) des activités sportives.

J'adore l'Italie. C'est cool

Reflexive verbs

Reflexive verbs are used for actions you do to yourself. They include a reflexive pronoun before the verb. The reflexive pronouns **me, te, se** shorten to **m', t', s'** before a vowel sound. The infinitive of a reflexive verb has the pronoun **se**.

- 4 Translate into French (*se réveiller* - to wake up).

Example: 1 Il se réveille

- 1 he wakes up
- 2 you wake up
- 3 she wakes up
- 4 I wake up
- 5 we wake up

- 5 Describe these morning routines.

Example:

Rémy se réveille. Il se

Mia Elle

Je voudrais + infinitive

You can use *Je voudrais* (I would like) to refer to your hopes and dreams for the future.

Je voudrais aller en Australie. I would like to go to Australia.

Je voudrais visiter la tour Eiffel. I would like to visit the Eiffel Tower.

- 6 Translate the sentences into French.

- 1 I would like to visit France.
- 2 I would like to go to the USA.
- 3 I would like to play tennis.
- 4 I would like to swim in the sea.
- 5 I would like to go round the world.
- 6 I would like to meet Johnny Depp.

The near future tense

Use **aller + the infinitive** to say what you're going to do.

je vais	regarde	I'm going to watch
tu vas	jouer	you're going to play (singular, informal)
il/elle/on va	danser	he's/she's going to dance/we're going to dance
nous allons	nager	we're going to swim
vous allez	sortir	you're going to go out (plural/formal)
ils vont	manger	they're going to eat
elles vont	dormir	they're going to sleep

- 7 Copy and complete the text using the correct forms of the near future tense.

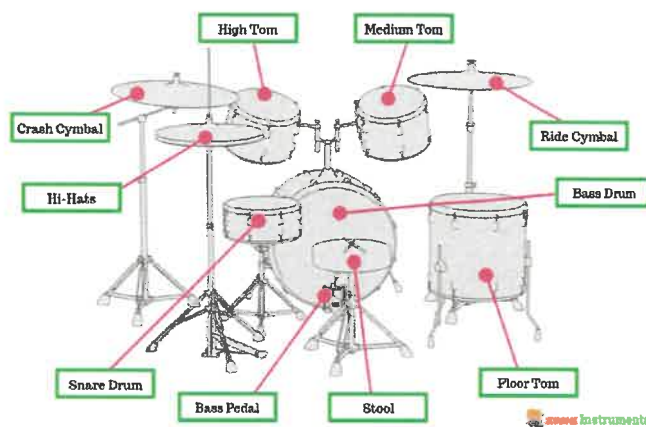
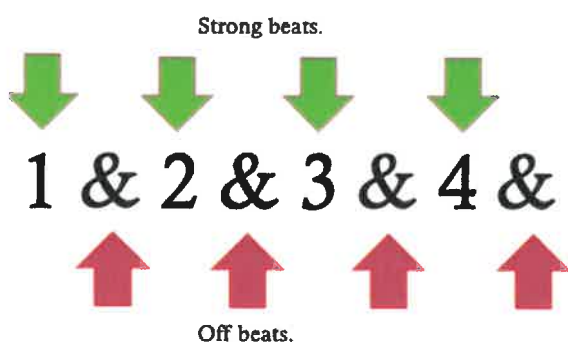
C'est bientôt les vacances et je suis impatient! Je 1 dans la mer et je 2 . Le soir, nous 3 et nous 4 . Mes copains vont aller à la montagne. Ils 5 et ils 6 . Ma sœur va partir en colo. Elle 7 . Qu'est-ce que tu 8 (faire)?

- 8 Translate the text in exercise 7 into English.

Music

Year 8 term one knowledge organiser

	Key term	Definition
1	Ensemble	A group of musicians who perform music live together
2	Syncopation	Accenting (playing with emphasis) the weaker beats in the bar
3	Tempo	The speed of the beat of a piece of music
4	Hook	A short repeated melodic idea
5	Timbre	The unique quality of the sound of an instrument
6	Bass line	The low pitch rhythmic part played by the bass guitar



Deeper reggae listening		
Artist	Song	Hyperlink
Lee scratch perry	Disco devil	https://www.youtube.com/watch?v=rbb192bVGAU
Bob Marley	Is this love	https://www.youtube.com/watch?v=CHekNnySAfM
Ini Kamoze	Here comes the Hot stepper	https://www.youtube.com/watch?v=OdmDp8_l-3c
The blood sisters	Ring my bell	https://www.youtube.com/watch?v=LiAaDN2bsA
Bob Marley	No woman no cry	https://www.youtube.com/watch?v=pHISE9j5FGY

Key Terms

Ageism, – discrimination on the grounds of being old, middle age or young

Discrimination – putting prejudiced thoughts into action

Equality – where everyone has the same value and importance

Harmony – to live peacefully with understanding and respect

Homophobia – discrimination on the grounds of sexuality (gay and lesbian people)

Justice – to treat people fairly according to the law

Positive discrimination – benefits given to those who usually face negative discrimination in order to make up for it, i.e. all women shortlists for gov't

Prejudice – pre judging someone, (usually negatively) without evidence

Racism – Discrimination on the grounds of skin colour (race)

Religious prejudice – Prejudice on the grounds of faith or belief which can lead to discrimination.

Choose from the following options:

- Easy – **Green**
- Medium - **Green & Orange**
- Difficult - **Green & Orange & Purple**



Develop	Extend	Challenge
Prejudice	Stereotype	Human rights
Discrimination	Justice	Pacifism
Racism	Tolerance	Segregation
Sexism	Harmony	The value of the individual
Ageism	Equality	Liberalism

SANCTITY OF LIFE - All life is sacred and special to God, (but human's more special as made in IMAGE of God) therefore **WE ARE ALL EQUAL**.

Christians should **actively fight** against discrimination e.g. Dr Martin Luther King, a black Christian minister who fought in a non-violent way against racism in America.

Traditionally, women were seen as **EQUAL but DIFFERENT ROLES**. **Roman Catholics** and others don't allow women to be priests as they are representing Jesus (a man). **Others** see all as having equal opportunity as all the **SAME in God's eyes**.

There are a **range of views on homosexuality** in Christianity but most would **not agree with persecuting them** or making them suffer.

"There is neither Jew nor Gentile, slave or free man, male or female. We are all one in Christ" (NT)

Jesus also said **'Love your neighbour as yourself'**



you love



Difference is **Allah's design** as so—A **GOOD THING!**

The **Muslim Declaration of human rights** states that all are equal
Muhammed allowed a **black man** to perform the **call to prayer**
On **Hajj** (pilgrimage, of the 5 pillars of Islam) everyone is **equal in dress** and action.

Ummah means 'brotherhood' and Islam teaches that you should respect and take care of each other no matter what your nationality etc.

During prayer Muslims **stand side by side** to demonstrate **unity** and brotherhood, but men and women pray separately to avoid distractions.

Women are **EQUAL** but have **DIFFERENT ROLES** to focus on, (bringing up children in the faith) and so cannot be an IMAM.

Muslims think **homosexuality is against God's** (Allah's) will but most would focus on **guiding people rather than persecuting** them. In **some** Muslims it is **illegal** though.



- 1.Can you explain what MLK did? [3]
- 2.What did they give up because of their beliefs? [4]
- 3.What would of happened if they hadn't given these things up (level 5)
- 4.What does they all have in common with the others (Level 6)
- 5.Who do you think gave up the most for their beliefs? Why? (Level 7)
6. Would you be prepared to do the same? (level 8)
7. What changes would you make in society (law/ education/families/media) to end prejudice?



P2 Chapter 1: Forces

Knowledge organiser

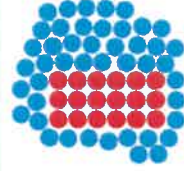
Activate
Question • Progress • Succeed

Friction and drag

- **Friction** is a force which will slow down a moving object due to two surfaces rubbing on one another
- The greater the friction, the faster an object will slow down, or the greater the force it will need to overcome the force of friction. For example, it is easier to push a block on ice than on concrete, as the ice is smoother and causes less friction
- When an object is moving through a fluid, either liquid or gas, the force which slows it down is known as **drag**
- The fluid particles will collide with the moving object and slow it down, meaning that more force is needed to overcome this
- Both drag and friction are **contact forces** as the two surfaces in friction, and the object and fluid particles in drag, come into contact with one another
- Both drag and friction are forces so they are measured in **Newtons (N)**



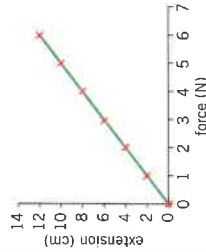
A solid moves through a gas.



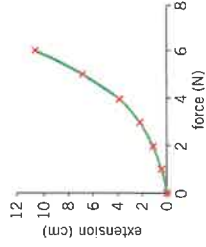
A solid moves through a liquid.

Hooke's law

- Some objects, like springs, can be stretched, the amount that they stretch is known as their **extension**
- A force needs to be applied to the spring for it to be stretched, we can achieve this by adding masses which exert the force weight
- A spring will continue to stretch until it passes its **elastic limit**
- If an object obeys **Hooke's law** it will have a **linear relationship**: if the force applied to the spring is doubled, the extension will double too
- If an object does not obey Hooke's law, it will not have a linear relationship



This graph shows how the extension of a spring changes as you pull it



This graph shows the relationship between force and extension

Key terms

Make sure you can write definitions for these key terms.

air resistance atmospheric pressure contact force linear relationship

drag elastic limit equilibrium pivot pressure resultant force

gas pressure Hooke's law incompressible

Turning forces

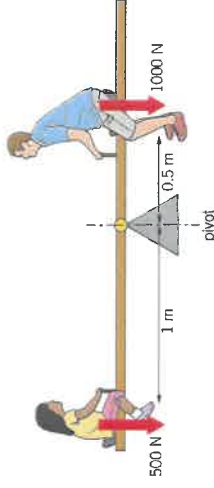
- A **moment** is the turning effect of a force, it is measured in Newton meters
- We can calculate a moment with the equation:

$$\text{moment (Nm)} = \text{force (N)} \times \text{distance from the pivot (m)}$$

- The size of the moment will increase as the distance from the **pivot** or the size of the force increases

- When an object, such as a seesaw, is balanced, the clockwise and the anticlockwise moments will be equal and opposite, which is known as **equilibrium**

- When forces are equal and opposite to each other, there is no **resultant force**



$$\text{clockwise moment} = \text{force} \times \text{distance on the right}$$

$$= 1000 \text{ N} \times 0.5 \text{ m}$$

$$= 500 \text{ Nm}$$

$$\text{anticlockwise moment} = \text{force} \times \text{distance on the left}$$

$$= 500 \text{ N} \times 1 \text{ m}$$

$$= 500 \text{ Nm}$$

Gas pressure

- **Gas pressure** is caused by the particles of a gas colliding with the wall of the container which they are in
- The more often that the particles collide with the wall of the container, the higher the pressure of the gas will be
- Gas pressure can be increased by:
 - Heating the gas so the particles move more quickly and collide with the container with a higher energy
 - Compressing the gas so there are the same amount of particles within a smaller volume meaning that there are more collisions
 - Increasing the amount of particles within the same volume so there are more collisions

- **Atmospheric pressure** is the pressure which the air exerts on you all of the time, nearer the ground there are more particles weighing down on you so the pressure is greater

- The higher you go, the smaller the atmospheric pressure, this is because there will be less particles weighing down on you

Pressure in solids

- The pressure which is exerted on a solid is known as **stress**
- The greater the area over which the force is exerted over, the lower the pressure, this is why snowshoes have a large area to prevent you sinking into the snow
- **Pressure** can be calculated using the following equation:

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Pressure in liquids

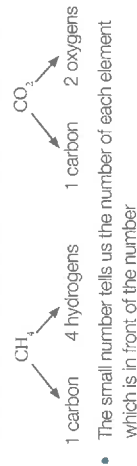
- Liquids are **incompressible**
- The particles in a liquid are already touching, meaning that there is little space between them to compress
- Liquids will transfer the pressure applied to them, this is seen in hydraulic machines
- As the ocean gets deeper, the pressure will increase, this is because the pressure depends on the weight of the water above
- The greater the number of water molecules above, the higher the pressure will be

Elements and atoms

- An **element** is a substance that only contains one type of atom, it is found on the **Periodic Table**
- Each element has its own unique chemical symbol which is the same in every language, these are also found on the Periodic Table
- An **atom** is the smallest part of which an element can be broken down into
- As there are around 100 types of elements that can occur naturally, there are around 100 different atoms

Compounds

- **Compounds** are formed when two or more different elements chemically bond together
- The compound will have different **physical properties** to the elements which make up the compound, for example water is a liquid, but it made from oxygen and hydrogen which are both gases
- Compounds are hard to separate and need a chemical reaction to do this
- When naming a compound, we always mention the metal first and the non metal second
- The name of the metal will not change but the name of the non metal will, for example oxygen can change to oxide
- Chemical formulae tell us how many atoms of each element are in the compound in relation to each other



Polymers

- **Polymers** are long chains of groups of atoms which are repeated many times
- Natural polymers are not man-made and include wool, cotton, starch and rubber
- Synthetic polymers are man-made and include polythene, polystyrene and nylon

Key terms

Make sure you can write definitions for these key terms.

atom alkali metals

compound noble gas

displacement reaction Periodic Table

element physical properties

Group 1 polymer trend

Group 7 halogen

Groups and periods

- **Groups** are the columns in the Periodic Table, they go downwards
- **Periods** are the rows in the Periodic Table, they go sideways
- Elements in the same group normally follow the same trends in properties such as melting point, boiling point and reactivity
- By placing these elements into these groups, scientists can make predictions about their properties

group number	1	2	3	4	5	6	7	0
1	H							
2	Li	Be						
3	Na	Mg						
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru
6	Cs	Ba	La	Hf	Ta	W	Re	Os
7	Fr	Ra						
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								

Group 0

- **Group 0** elements are known as the **noble gases**
- They are all non metals with low melting and boiling points, meaning all are gases at room temperature
- The boiling point decreases going down the group
- All of the group 0 elements are unreactive
- When electricity is passed through the gas, they emit a brightly coloured light, this can be seen in neon signs

Halogens

fluorine chlorine bromine iodine

most reactive ← least reactive

Group 1

- **Group 1** elements are also known as the **alkali metals**
- They share similar properties with other metals such as:
 - Being shiny when freshly cut
 - Being good conductors of electricity and heat
- Group 1 metals are much softer than other metals and also have much lower melting and boiling points
- Group 1 elements react with water to form alkali solutions
 - lithium + water → lithium hydroxide + hydrogen
 - metal + water → metal hydroxide + hydrogen
- The further down the group that the metal is, the more vigorous the reaction will be. This is called a **trend**
- Another trend seen in Group 1 is with the boiling and melting points: the further down the group, the lower the boiling and melting points are

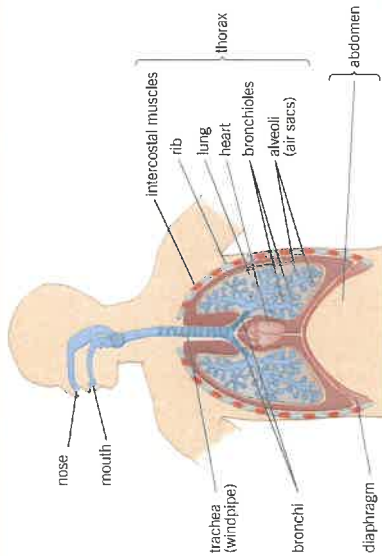
Group 7

- **Group 7** elements are also known as the **halogens**
- They share similar properties with other non metals such as:
 - Having low melting and boiling points
 - Not conducting electricity
- Moving down the groups the elements have an increased melting and boiling point
- The halogens also react in a similar way to one another, for example with iron:
 - iron + chlorine → iron chloride
 - iron + bromine → iron bromide
- Halogens can undergo **displacement reactions**, this is where a more reactive halogen will take the place of a less reactive halogen
- The most reactive halogens are at the top of the group, and the least reactive halogens are at the bottom of the group
- If the most reactive halogen is on its own, it will take the place of the less reactive halogen in a compound



Gas exchange and breathing

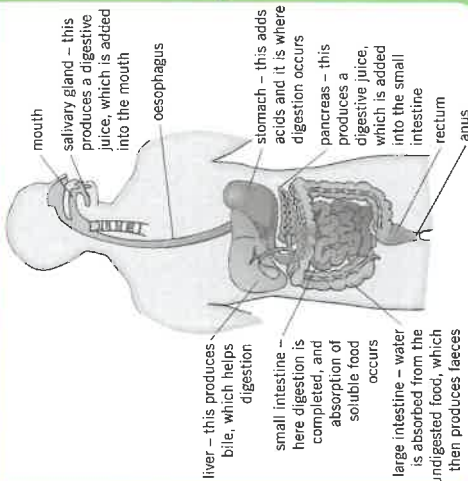
- Gas exchange is the process of taking in oxygen and giving out carbon dioxide
- This occurs in the **respiratory system**
- The proportions of gases in the air we **inhale** and **exhale** changes due to using oxygen in **respiration** and producing carbon dioxide



What happens when you breathe in and out

when you breathe in (inhale)	when you breathe out (exhale)
- muscles between the ribs contract - ribs are pulled up and out - diaphragm contracts and flattens - volume of the chest increases - pressure inside the chest decreases - air rushes into the lungs	- muscles between ribs relax - ribs are pulled in and down - diaphragm relaxes and moves up - volume in the chest decreases - pressure inside the chest increases - air is forced out of the lungs

The digestive system



Enzymes

- Enzymes** are biological **catalysts**, they speed up the digestion of **nutrients**
- Each enzyme is specific to each nutrient
- The way the enzyme and nutrient bind with each other is called a lock and key model
- Carbohydrases** break **carbohydrates** down into simple sugars
- Proteases** break **proteins** down into amino acids
- Lipase** breaks **lipids** (fats) down into fatty acids and glycerol



Nutrients

- A **balanced diet** involves eating the right amount of nutrients for your body to function
- Not eating enough of a nutrient means you have an unbalanced diet, and this can lead to a **deficiency**

Nutrient	Role in your body
carbohydrates	main source of energy
lipids	fats and oils provide energy
proteins	growth and repair of cells and tissues
vitamins and minerals	essential in small amounts to keep you healthy
water	needed in all cells and body fluids
fibre	provides bulk to food to keep it moving through the gut

Drugs

- Drugs** are chemicals that affect the way that our body works
- Medicinal drugs** are used in medicine, they benefit health
- If medicinal drugs are not taken in the correct way they can harm health
- Examples include antibiotics and pain killers
- Recreational drugs** are taken by people for enjoyment
- Recreational drugs normally have no health benefits and can be harmful for health
- Examples include alcohol and tobacco
- Drug **addiction** is when your body gets so used to a drug, it feels it cannot cope without it
- If someone who has an addiction stops taking the drug, they will experience **withdrawal symptoms**

Key terms

Make sure you can write definitions for these key terms.

addiction balanced diet mineral medicinal drug nutrient carbohydrate protease protein catalyst deficiency drug enzyme exhaled fibre gas exchange inhale lipid withdrawal symptoms