Knowledge Organisers
Spring Term – Year 8

Name: _____

Please remember:
- It is to be kept inside your knowledge organiser book
- It is to be brought into school every day

Regular retrieval throughout a scheme of learning (daily, weekly and monthly) has been proven to **reduce the rate of forgetting**, supporting you to **retain more** in long term memory- making assessments/ exams way easier! The challenge for you as a student is to make sure you use your knowledge organiser for each subject properly to help you to know more and remember more over time. We've created this walk through to support you in using your knowledge organiser- for more support speak to your subject teachers.

Using your Knowledge Organiser

1	2	3	4	5
Look	**Cover**	**Write**	**Check**	**Repeat**
Start with a **small section of knowledge** that you want to remember e.g Henry VIII's wives in History. Read through this section of the knowledge organiser (a couple of times if it helps)	Now **cover up this section** of your knowledge organiser with a post it note or scrap paper.	**Self quiz- what can you remember** and rewrite? Make sure you do this without looking back at your knowledge organiser.	**Remove the post it and check for accuracy**- did you get the key terminology? Was it spelt correctly? Was the order correct? If you drew a diagram, how much of this did you get correct? Most importantly- what did you miss out?	After a short break away from your knowledge organiser repeat the look, cover, write, check **until you can recall all of the facts correctly without prompts.** This process can be used for any new knowledge that you want to acquire. It is good idea to do this on a regular basis, once a week.

Strategy 1- Look, cover, write, check – A really simple but effective way to use your knowledge organiser. Focus on a specific area of your knowledge organiser.

1	2	3	4	5
Focus	**Big ideas**	**Explain it**	**Link it**	**Record it**
Make it manageable by selecting an area of your KO <u>where your learning is not secure.</u> Don't waste time going off something you can already do!	Pick out the main points or the **big ideas** in this section.	**Explain what you know** about the main points (this could be written or shared verbally – a friend, a family member.	Now, see **how it links to other areas** within the subject. *E.g Eating meat – causes global warming. Cows produce methane which is a greenhouse gas.*	**Write down as many 'think it, link it' ideas** as you can in your book. See if you can beat others in you class!

Strategy 2- Think it, link it – Great for connecting the big ideas in your subject. How does 'x' relate to 'y'. What are the key factors which make an equation/ experiment/ process work? Challenge yourself to see how many links you can make!

1	2	3	4	5
Select topic	**Prepare quiz**	**Answer it**	**Self check**	**Repeat**
Decide **which area you want to be quizzed** on (this might build up over time)	Get someone else to **prepare 10 random questions** on that topic to challenge you.	**Set a time limit** (depending on the number of questions) and answer the questions without looking at your KO.	Now look at your KO to **self check**- make a note of your score. Celebrate your successes and make a note of anything you missed or got incorrect.	**Return to this section** in 2/3 weeks- see if you can improve your score! Re-do those questions that you missed or got incorrect.

Strategy 3- Knowledge quiz – You might try this after a few weeks of using your knowledge organiser. Get someone to set you 10 questions using your knowledge organiser. These could be spellings, key words, processes, equations etc to see how much you can remember! Record your score and see if you can beat your personal best each half term!22

Contents Page

Mastery Writing Two Rules

¶ Paragraph rules:

- New paragraphs start **two finger spaces** from the margin. All other lines start at the margin.
- This is called **indenting (h)** a paragraph.

Tense rules:

- When you tell what **happened**, you put "ed" on the end of the action.
- When you put actions in the past simple, you say what happened, not what was happening.
- When you start with when it happened, you put a **comma** right after when it happened.
- You don't use a comma if when it happened is at the end.

¶ *As Benedict left his home, he was filled with joy. His mother had let him finally wear his new football boots. That afternoon, he returned home and his boots were ripped.*

Sentence and subject rules:

- If the next sentence uses the same **subject** (n)**(thing or person that the sentence is talking about),** you should use a **pronoun (i)** to replace it.
- You can only use the **pronoun** (i) to replace a subject you have used in the sentence before.
- When you list two things a subject did in one sentence, **you only name the subject (n) onc**e.
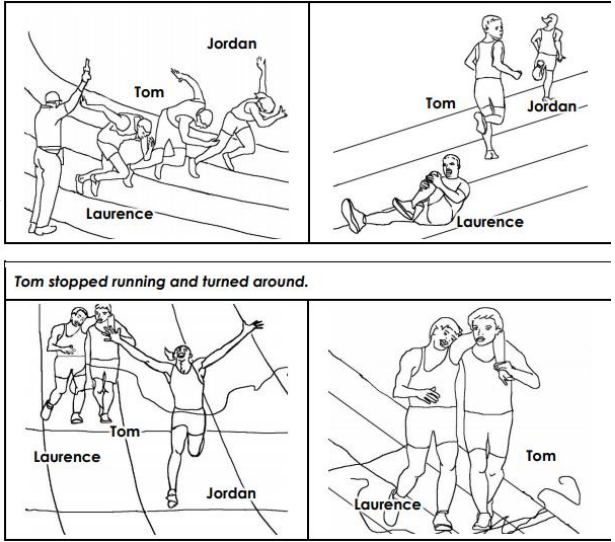- If there are two **objects** in a sentence, you **can't use it** in the next sentence.
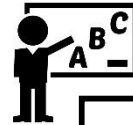
Grammar and punctuation rules:

- If a person said more than one sentence, put everything they said inside the **'inverted commas'** (f).
- If the part that starts with 'although', 'unless' or 'if' is at the start of the sentence, it is followed by a comma
  e.g. Although Cerys did not receive the puppy she wanted for her birthday, she was grateful for all the other gifts she received.

4

English – Year 7 – Mastery Writing 2 – Story Writing Model Example.

ORMISTON SWB ACADEMY

You will receive a set of pictures like these. You will need to **practice your writing working on the rules** you've been doing in **that lesson, and the lessons before**.

You must include all the Mastery Checks.

Jordan
Tom
Laurence

Tom
Jordan
Laurence

Tom stopped running and turned around.

Tom
Laurence
Jordan

Laurence
Tom

I have inferred p) from the four boxes what the most likely set of events are and will write them into a story.

I have written in the **past tense.**

FUTURE
PRESENT
PAST

I have introduced my main subject (n). I have told the audience where they are.

I have structured my story in paragraphs. I have **indented (h) my paragraphs**.

Aa

Tom, Jordan and Laurence had started to race each other. Tom and Jordan had begun to take the lead. Laurence tripped over his laces and fell onto the ground.

¶ Devastated, Laurence held his knee in agony. Just when he thought he was all alone, Tom turned around to help him up. Although Jordan technically won the race, Laurence and Tom finished together and they won each other's friendship.

I have a **complication** (m) in my story.

I have used **verbs** (l) to show how my character is feeling.

I have written in **complete sentences (c).**

I have **solved the problem**.

I have used **complex sentences** (d) throughout my work.

	Key terms	Definition
A	**Adjective**	A word which describes a noun: **Example:** sweet, short, bitter, stinky
B	**Adverb**	Describes a verb or adjective. An adverb answers how, where, when how much, how often. **E.g.: quickly, easy and never.**
C	**Complete Sentences**	A sentence which contains a subject and a verb. **Example:** She went to the shop
D	**Complex Sentences**	A sentence containing a subordinate clause
E	**Conjunctions**	A conjunction is a part of speech that connects words, phrases, or clauses. **Example:** for, and, but.
F	**Inverted commas**	The punctuation which indicates when speech has happened. " and ".
G	**Fused Sentences**	A sentence which has not used punctuation between the next subject. **Example:** She went to the shop she bought some milk.
H	**Indent**	Starting the first line of a paragraph further away from the margin than other paragraphs.
I	**Personal Pronoun**	A first person word which replaces a name, like "we, I" etc.
J	**Simple Sentences**	A sentence with one clause, one subject and one verb. **Example:** Jack likes fishing.
K	**Subordinate Clause**	A clause which does not make sense on its own. (e.g. 'when it rang' in 'she answered the phone when it rang').
L	**Verb**	A word which describes an action **Example:** read, write, drive, walk.
M	**Complication**	Something which causes a difficulty for a character.
N	**Subject**	The person or thing doing the verb in the sentence.
O	**Singular/plural**	Singular means one and plural means more than one.
P	**Infer**	When you work out information from the evidence you have.

Mastery Writing Three Rules

¶ Paragraph rules:

- New paragraphs start **two finger spaces** from the margin. All other lines start at the margin.
- This is called **indenting (h)** a paragraph.
- A new paragraph should start when there is a **change in: time, place topic or a new person/speaker begins to speak. (TiPToPS)**.

Tense rules:

- When you put actions in the past simple, you say what **happened**, not what was happening.
- When writing in the past tense, be careful to choose the **correct verb** to go with the subject. Not all verbs in the past simple end with 'ed'. E.g. The boy got <u>sent</u> home.

While Sally sat and wrote a lengthy letter, an abundance (a) of tears dropped on the page. From her office window, she noticed Travis's dog through a pane of glass although her glossy eyes impaired her vision.

Sentence and subject rules:

- Sentences must either be, or contain, an independent clause.
- An independent clause must have a **subject (m), a verb (l) and expresses a complete idea (c)** for it not to be a fragment (p).
- Phrases beginning with 'although', 'if', 'unless', 'even though', 'because' and 'whenever' are other forms of subordinate clauses (k).
- However, there are other subordinate clauses (k) that do not begin with these words. For example, '<u>Like a bullet</u> speeding through the air, he ran through the door'.
- If the **temporal clause (b)** is at the start of the sentence, a comma should follow. If the temporal clause is at the end of a sentence, no comma should follow.

Punctuation:

- When **two independent clauses** (c) are joined together by a comma (comma splice (g)), you should correct this by changing the comma to a full stop. Alternatively, **change the second independent clause into a subordinate clause (k)** to keep the comma. For example: 'Tom read the novel. His friend saw the movie' and 'Because Tom read the novel, his friend saw the movie.'
- Apostrophes of **omission (j)** replace the letter you have removed. E.g. <u>He's</u> the greatest dancer – <u>He is</u> the greatest dancer. You <u>must not use</u> an apostrophe to show that a noun is plural e.g. "the egg's", or the verb is in the third person e.g. "Barry walk's" – **this is incorrect.**
- If a **singular** (o) noun:
    - doesn't end in s, you add an 's e.g. Kate's cat.
    - ends in s, you still add 's e.g. James's cat, Dickens's writing.
    - ends in ss, you still add 's e.g. The princess's cat.
- If a **plural** (o) noun:
    - ends in s, you add ' e.g. The cats' dinner.
    - does not end in s, you add 's e.g. The people's voice.

6

ORMISTON SWB ACADEMY

You will receive a single picture like this. You will need to **practice your writing working on the rules** you've been doing in **that lesson and the lessons before**. Vocabulary will be provided to guide your narrative.

You must include all the Mastery Checks.

Part 1: Opening	Part 2: Problem		
Part 3: Solution	Part 4: Happy Ending		

Jamila

deafening	emergency	pressure	void
oxygen	mission	terror	perilous

Write an **outline of your story** in the clear, **four-part structure**. You should think carefully about the different sections do what they are for. This narrative structure is for 'problem solved' stories. **Not all stories will follow this structure**.

I have introduced my **main subject (n)**. I have told the audience where they are.

Aa

¶ As Jamila departed the International Space Station, she inhaled. Poised, she cleared her throat and informed her colleagues that she was prepared for the **perilous** task ahead. Jamila trained for years for her **mission** in locating the missing astronaut. She knew that if something went wrong, she had spirit on her side. On the edge of the platform, she looked out at the **void.** The quiet put her at peace. She knew Iris, her daughter, was proud.

I have written in the **past tense throughout.**

I have used **Mastery vocabulary**.

FUTURE / PRESENT / PAST

¶ The **deafening** silence surrounded Jamila. Her only way out was to continue on. In that moment, she was alerted to a hissing sound. To Jamila's horror, she realised she was quickly losing **oxygen**. Wide eyed and overwhelmed by **terror**, she screeched out to her colleagues, "Please help. My **oxygen** tank is faulty!". Jamila closed her eyes and felt the strong rhythm of her heartbeat in her throat. Silence once again surrounded her. Confused and under **pressure** to survive, she noticed the International Space Station in the distance.

I have used **complete sentences (c) throughout.**

I have a **problem** in my story and used **direct speech** to show this using **inverted commas (e)**.

I have followed the writing structure of a **problem solved story.** Each paragraph focuses on an element of the writing structure.

¶

	Key terms	Definition
A	**Abundance**	A very large amount of something.
B	**Temporal clause**	A clause which informs the reader about the time when the action of main verb of the sentence occurred.
C	**Complete Sentences (idea)**	A sentence which contains a subject and a verb. Makes sense alone. **Example:** She went to the shop.
D	**Complex Sentences**	A sentence containing a subordinate clause (k) and a main clause.
E	**Inverted commas**	The punctuation which indicates when speech has happened. " and ".
F	**Fused Sentences**	A sentence which has not used punctuation between the next subject. **Example:** She went to the shop she bought some milk.
G	**Comma splice**	A **comma splice** is when two independent clauses are incorrectly joined by a **comma** to make one sentence.
H	**Indent**	Starting the first line of a paragraph further away from the margin than other paragraphs.
I	**Apostrophe of possession**	A punctuation mark that shows that one thing belongs to another. **"Mark's pen."**
J	**Apostrophe of omission**	A punctuation mark that is used to show two words have been combined into one.
K	**Subordinate Clause**	A clause which does not make sense on its own. (e.g. 'when it rang' in 'she answered the phone when it rang').
L	**Verb**	A word which describes an action **Example:** read, write, drive, walk.
M	**Subject**	The person or thing doing the verb in the sentence.
N	**Singular/plural**	Singular means one and plural means more than one.

ORMISTON SWB ACADEMY

Act 1

1. King Alonso and his friends are caught in a tempest (a) at sea.

2. Prospero informs the islanders that he caused the storm. Then, Prospero tells Miranda about their past memories of her childhood and his betrayal (b).

3. Ariel, Prospero's servant, reports that he has scattered the survivors on various parts of the island. Prospero and Caliban argue.

4. Suddenly, Ferdinand and Miranda instantly fall in love. Prospero demands that Ferdinand completes a set of tasks.

Act 2

1. Ariel puts all the ship's passengers to sleep except Antonio and Sebastian who plot to seize (k) King Alonso's crown.

2. Just as they are about to attack the sleeping King, Ariel wakes the party up who all leave in search of Ferdinand.

3. Trinculo and Stephano meet Caliban and give him wine. Caliban drunkenly worships Stephano.

Act 3

1. Ferdinand and Miranda declare their love and agree to marry although Ferdinand is still enslaved (c) by Prospero.

2. Caliban, Trinculo and Stephano plot to kill Prospero with Caliban promising that Stephano can marry Miranda. Ariel overhears and reports the plan to Prospero.

3. A banquet appears in front of the royal party, but, as they are about to eat, Ariel appears as a harpy(d) and accuses King Alonso, Antonio and Sebastian of being criminals.

Act 4

1. Prospero arranges the marriage of Miranda and Ferdinand, but halts the masque (f) as he remembers Caliban's plan.

2. Prospero tells Ariel to tempt the men with garish (g) clothes and sends spirits after them. Prospero promises to free Ariel soon.

Act 5

1. Prospero promises to give up magic.

2. The group arrive and Prospero forgives them but states Antonio must give up his claims on Prospero's ruling of Milan.

3. Prospero reveals to Alonso that Ferdinand is alive and married to Miranda.

4. The royal party are invited to spend the night while Ariel's final duty is to provide calm seas for them to set sail the next morning.

The Epilogue

Prospero's final speech:

Now my charms are all overthrown,
And what strength I have's mine own,
Which is most faint: now, 'tis true,
I must be here confined by you,

Or sent to Naples. Let me not,
Since I have my dukedom got
And pardon'd the deceiver (o), dwell
In this bare island by your spell;

But release me from my bands
With the help of your good hands:
Gentle breath of yours my sails
Must fill, or else my project fails,
Which was to please. Now I want
Spirits to enforce, art to enchant,
And my ending is despair (p),
Unless I be relieved by prayer,
Which pierces so that it assaults
Mercy itself and frees all faults.
As you from crimes would pardon'd be,
Let your indulgence set me free.

Act 1

"in my false brother/Aw awaked an evil nature."

"abhorred (h) slave… vile race."

"This island's mine, by Sycorax my mother."

Act 2

"My strong imagination sees a crown dropping upon thy head."

"A plague upon the tyrant that I serve!"

"I'll show thee every fertile inch o' th' island; And I will kiss thy foot."

Act 3

"I am your wife, if you will marry me./If not, I'll die your maid."

"Be not afeared, The isle is full of noises, Sounds, and sweet airs."

"You are three men of sin (e), whom Destiny (i) this lower world…"

Act 4

"help to celebrate a contract of true love."

"…my rich gift."

"Shortly shall all my labours end, and thou Shalt have the air at freedom."

Act 5

"I'll break my staff/ I'll drown my book."

"Thy dukedom I resign (j), and do entreat Thou Pardon me my wrongs."

"…your affections would become tender."

The Epilogue

"I must be here confined (l) to you."

"But release me from my bands with the help of your good hands."

8

ORMISTON SWB ACADEMY

Themes

Freedom and Colonialism
Prospero is sent away from Milan and trapped on the island. He then enslaves (c) Caliban and Ariel who are natives (m) to the island. Prospero promises to free Ariel and eventually acts upon this.

Justice and Forgiveness
Prospero attempts to seek justice (e) by regaining his rightful power from his brother Antonio. To conclude the play, Prospero embraces the Christian value of forgiveness before resuming his place as Duke of Milan.

Love
Miranda and Ferdinand fall in love at first sight and arrange to marry. Prospero, out of love for his daughter, makes Ferdinand prove his love. Family love is displayed through the concern parents have for their children.

The Supernatural
Prospero's thirst for knowledge about magic is what lost him his position as Duke of Milan. His cloak, books and staff symbolise his knowledge and power which is destroyed in Act 5. Prospero uses magic to control Ariel to commit a number of magical acts in the name of justice (e).

Characters

Caliban
Native (m) of the island. Enslaved (c) by Prospero.

Ariel
Native (m) of the island. Enslaved (c) by Prospero.

On island

Prospero's family

Gonzalo
Counsellor to Alonso. Provided aid to Prospero.

Prospero
The rightful Duke of Milan

hates →

Antonio
Brother of Prospero.

helps →

Miranda
Daughter of Prospero

Ferdinand
Son of Alonso.

Shipwrecked party

Alonso — **Sebastian**

Alonso
King of Naples.

Sebastian
Alonso's brother who plots to murder the king.

Ferdinand
Son of Alonso.

A jester and a butler who serve

plot to kill

Stephano — **Trinculo**
Minor members of the shipwrecked party.

Context

A patriarchal society Society throughout the Middle Ages and at Shakespeare's time was patriarchal - women were considered to be below men. Women belonged to their fathers (or brothers if their fathers had died) and then their husbands.

The Colonial Era At the time the play was written, Shakespearean audiences would have been interested in the efforts of English (and other European) settlers to colonialise (n) distant lands around the world. These ideas are common in the play, as almost every man who sets foot on the island dreams of ruling it. Prospero's cruel treatment towards Caliban is similar to the behaviour of settlers to natives (m).

	Key terms	Definition
A	Tempest	A violent windy storm.
B	Betrayal	The act of deliberately being untrustworthy.
C	Enslaved	Causing someone to lose their freedom..
D	Harpy	A monster described as having a woman's head and a bird's body.
E	Justice	The act of gaining fair treatment.
F	Masque	Formal entertainment of the 16th and 17th century.
G	Garish	Colourful, detailed, patterned clothing.
H	Abhorred	To consider with disgust or hatred.
I	Destiny	The events that will happen to a particular person or thing in the future.
J	Resign	Leave something without force.
K	Seize	Take hold of something with force and suddenly.
L	Confined	Limited space or area.
M	Native	A person born on the land they currently live.
N	Colonialise	Establish political control over a place.
O	Deceive	Make someone believe something untrue.
P	Despair	Having no hope.
Q	Indulgence	To enjoy something you have desired.

9
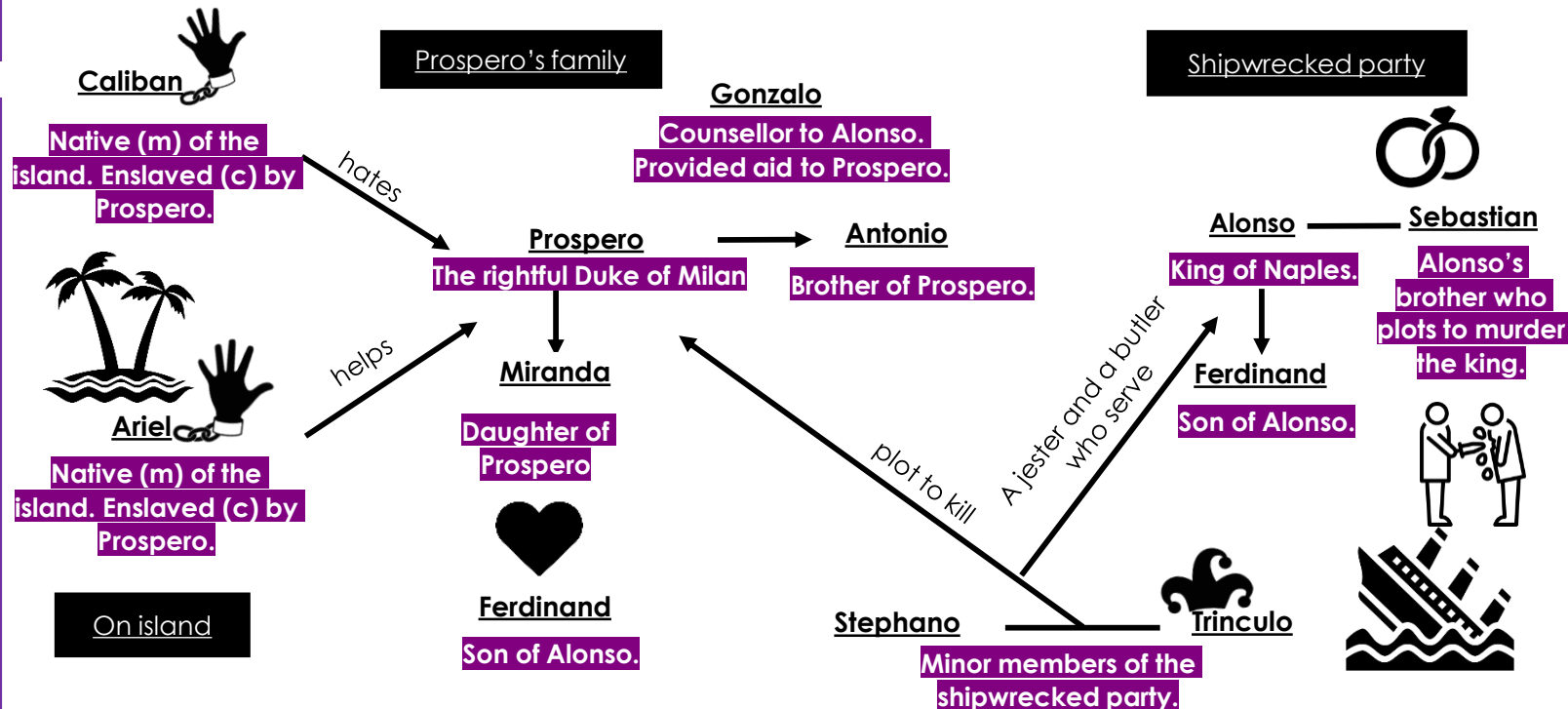
Measuring Turn

One way that we can interpret an angle is as a measure of **turn**. How many degrees has the line segment turned through in each case?
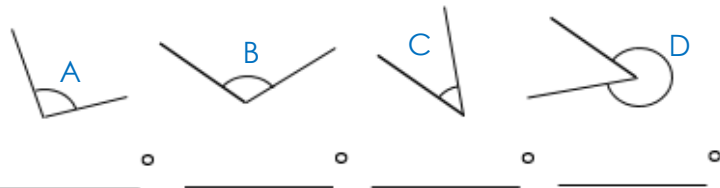
360°
(a full turn anticlockwise)

90°
(A quarter turn anti-clockwise)

180°
a half turn clockwise

270°
clockwise
(Three quarters of a turn clockwise)
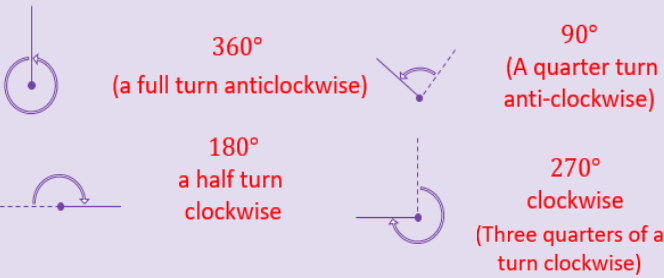
incorrectly estimated?

Which of these angles have been incorrectly estimated?

a.	b.	c.	d.
251°	44°	200°	151°
e.	f.	g.	h.
215°	87°	84°	191°
i.	j.	k.	l.
193°	360°	27°	85°
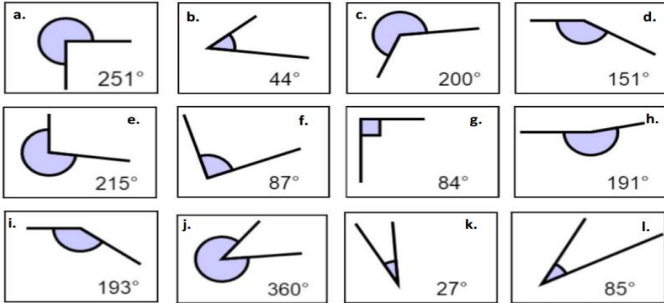
Write the incorrect estimations here:

Comparing Angles

A   B   C   D

Estimate the size of each angle.
What type of angle is each?
Which is the smallest angle?
Place them in order of size.

Measurement Mistakes

Take care when measuring angles with a **protractor** - make sure you read the scale starting at zero.

I think the angle is 115°

115° is the size of this obtuse angle. You can add an additional **180°**. The correct answer is **295°**.

65° is the size of this acute angle. You can subtract **65°** from 360°. The correct answer is **295°**.
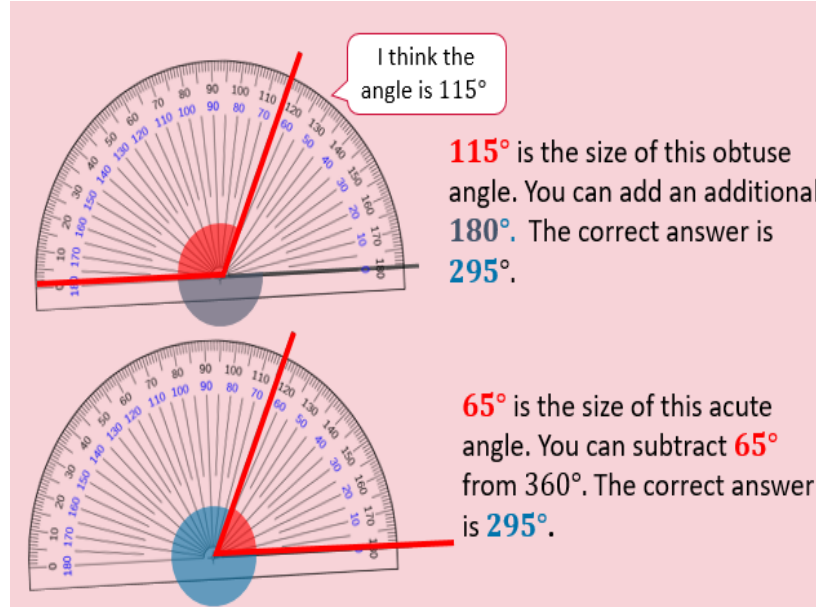
Types of Angles

Deciding which type of angle you have helps when estimating its size and also helps you make sure you measured it correctly.

Less than 90°

Between 90° and 180°

Between 180° and 360°

Exactly 90°

Acute   Obtuse   Reflex   Right Angle

Partitioning known angles
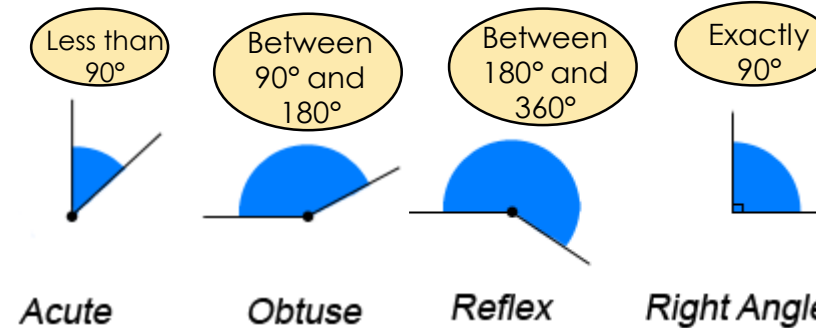
Connect each equation to the bar model and image.

$$c + d = 360$$

90

$$90 - c = d$$

180

$$180 = c + d$$

360
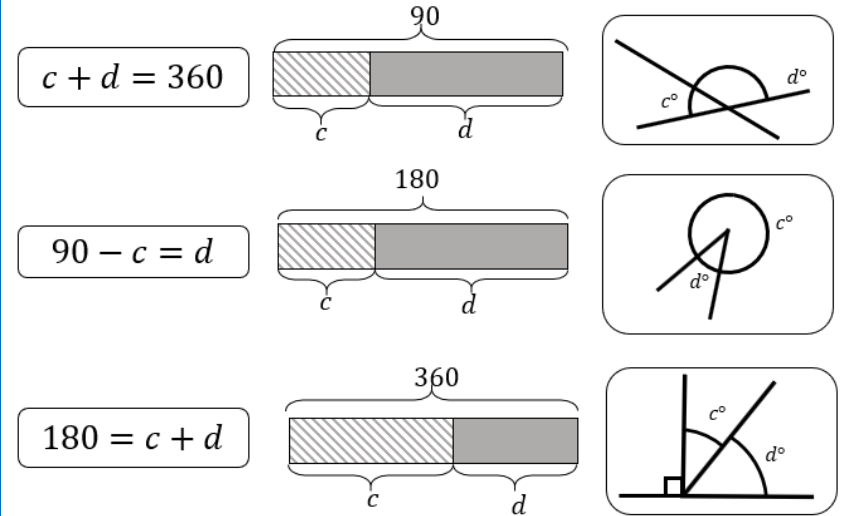
You need to know that:
Angles that meet on a straight line sum to 180 °
Angles that meet at a point sum to 360 °

Making connections

90

a   45   a

360

a   a   a   a

180

a   150

150°
a°
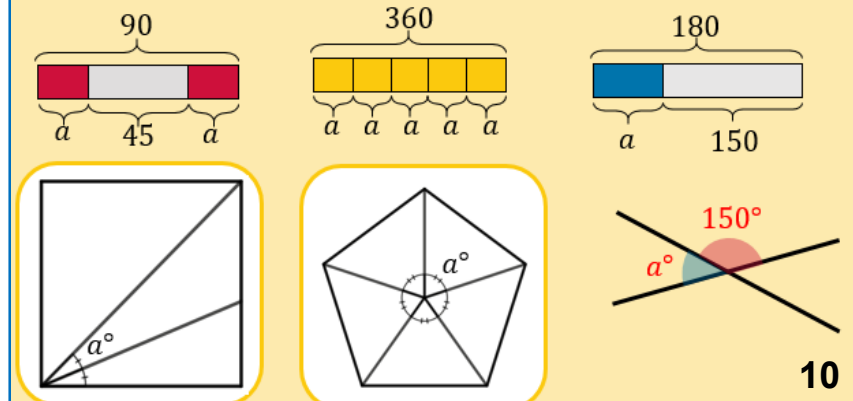
parallel lines

- lines that are always an equal distance apart.
  - coplanar lines that do not intersect.

EXAMPLES:

parallel lines

Parallel lines are equidistant, always the same distance apart
… never touching

angles created by a transversal intersecting parallel lines

transversal

a b
c d
e f
g h

Corresponding angles are equal

Pairs of corresponding angles are shown in the same colour.
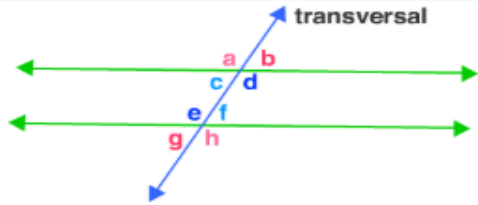
Intersection Points

Alternate angles are equal
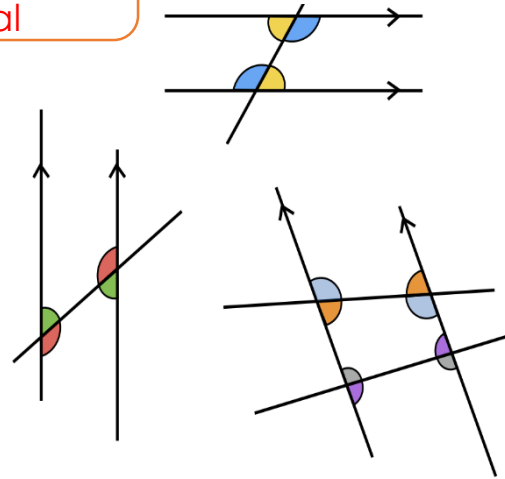
Pairs of alternate angles are shown in the same colour.

Vertically Opposite Angles
When two straight lines intersect, two pairs of vertically opposite angles are formed.

a
d b
c

$a = c$ and $b = d$

Vertically opposite angles are equal.
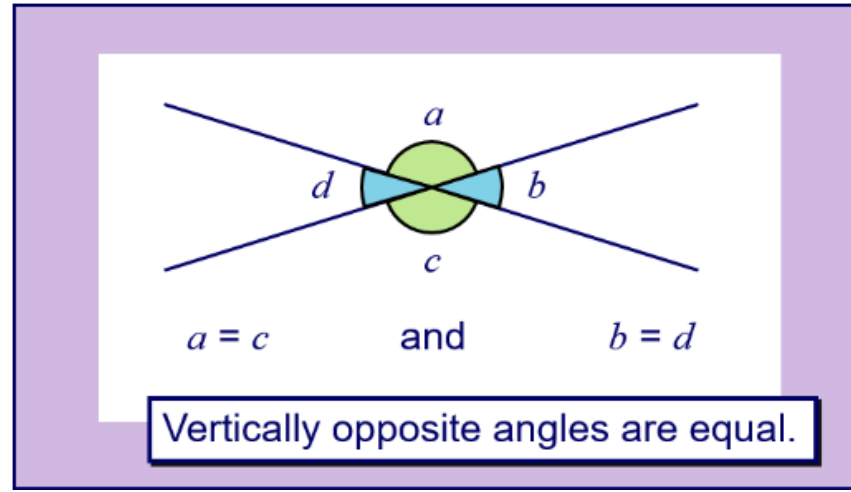
Keyword/Skill	Definition/Tips
Angle	The amount of turn between two rays called arms meeting at a common point called vertex.
Vertically opposite	Pair of angles directly opposite to each other, formed by intersection of straight lines.
Reflex	Any angle that measures more than 180 degrees but less than 360 degrees.
Parallel	Equidistant lines, that is, exactly the same distance apart and never touching.
Partitioning	A strategy that splits numbers into smaller addends, factors or place value to make calculation easier.
Perpendicular	Meeting or crossing at a right angle.
Protractor	An instrument used to measure angles in degrees.
Adjacent Angles	Angles immediately next to each other.
Degrees	The unit of measuring the size of an angle.
Acute	Any angle that measures less than 90 degrees.
Obtuse	Any angle that measures between 90 degrees and 180 degrees.
Right angle	Any angle that measures exactly 90 degrees.

11

Alternate Angles

You need to know that alternate angles are equal.
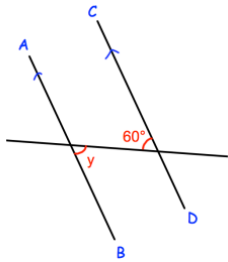
Example

AB is parallel to CD
Q-work out angle y
A- 60°
Q-Give a reason for your answer.
A- Alternate angles are equal.

Corresponding Angles

You need to know that corresponding angles are equal.
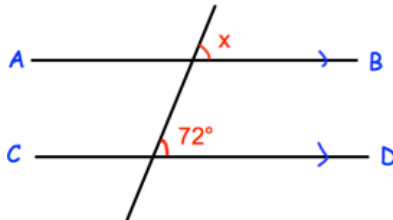
Example

AB is parallel to CD
Q-work out angle x
A- 72°
Q-Give a reason for your answer.
A- Corresponding angles are equal.

Co-Interior Angles

Co-interior angles add up to 180°

Q-Work out x
A- 180- 105 = 75°
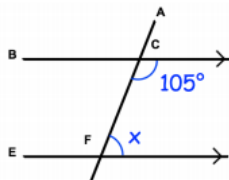
Applying other known angle facts

You need to be able to apply a range of angle facts to more complex angle questions

Example

CE and FI are parallel lines.
Angle EDH = 50°
Angle DGF = 100°
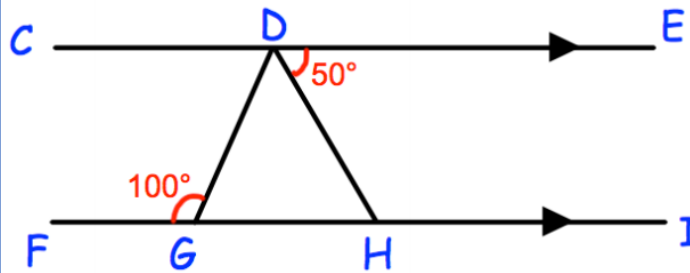
Show, giving reasons that triangle DGH is isosceles.

Angle facts to use

DHG = 50° –alternate angles are equal.
DGH = 80° –angles on a straight line = 180°
GDH = 180-80-50 = 50° - angles in a triangle sum to 180°
Triangle DGH is isosceles as it has 2 equal angles of 50°.
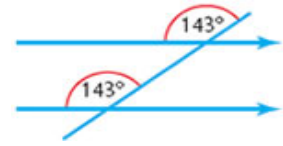
Exams!
- Use a highlighter or a different colour to highlight angle facts on any diagram given.
- Always show your method and give reasons.

Keyword/Skill	Definition/tip
Angle	The amount of turning between two lines meeting at a point.
Alternate angles	Two angles that are formed when a line (transversal) crosses a pair of parallel lines. These angles are equal.
Corresponding angles	Angles that share the same relative position when a transversal crosses a pair of parallel lines. These angles are equal.
Parallel Lines	Lines that are always the same distance apart. (Like train tracks)
Transversal	A line that crosses two other lines. (Red)

Other topics/Units this could appear in:
- Trigonometry
- Vectors
- Bearings
- Coordinate geometry

12

Bearings are used to specify direction and are used to navigate ships and aeroplanes.
The key point to remember are:
1. Bearings are measured starting from North.
2. Bearings are always measured in a clockwise direction.
3. Bearings are always written in 3 figures (45° becomes 045°).

Compass Points

000°	N
338° NNW	023° NNE
315° NW	045° NE
293° WNW	068° ENE
270° W	090° E
248° WSW	113° ESE
225° SW	135° SE
203° SSW	158° SSE
180° S	
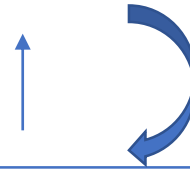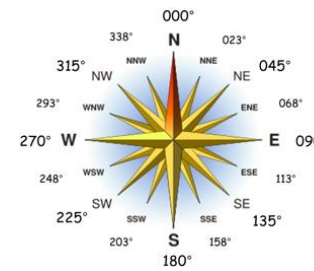
Keyword/Skill	Definition/Tips
Bearing	The angle measured in degrees clockwise from North.
Degree	A measure for angles. There are 360 in a full turn.
Perpendicular	A line that is at a right angle, 90°, from another line
North line	A line facing North that all bearings are measured from.
Clockwise	Moving in the direction of the hands of a clock.
Angle	The amount of turn between two lines about their common point.
Bisect	To divide something into two equal parts.
Protractor	An instrument used to draw or measure angles.

Measuring Bearings

Find the bearing of A from B.
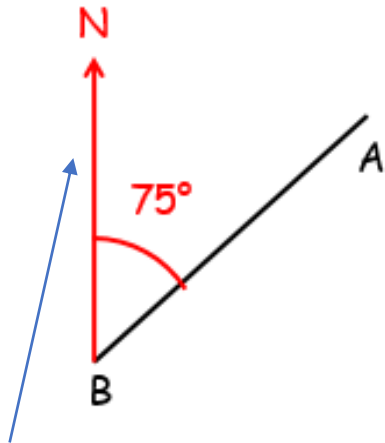
Mark the North line at B. (You can draw this in if there isn't one).

Measure the angle, clockwise from the North line to A.

Give the answer as a three figure bearing.

075°

Drawing Bearings

B is on a bearing of 120° from A and a distance of 4cm.
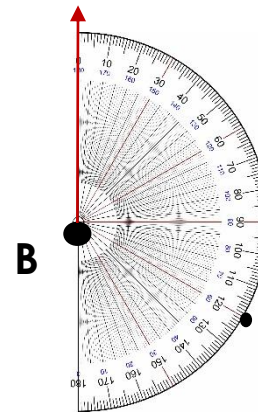
From point B, measure an angle of 120°. Label it so you don't forget where it is.
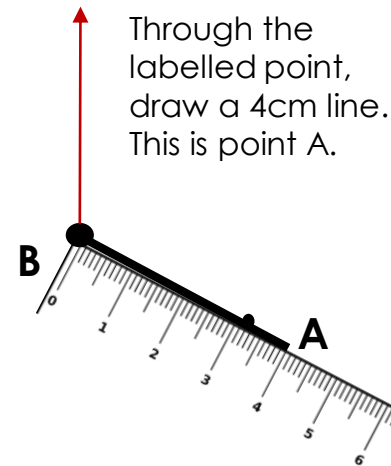
Through the labelled point, draw a 4cm line. This is point A.

Calculating Bearings

Find the bearing of A from B.
You need to remember some angle facts to calculate these without a protractor!

Corresponding angles
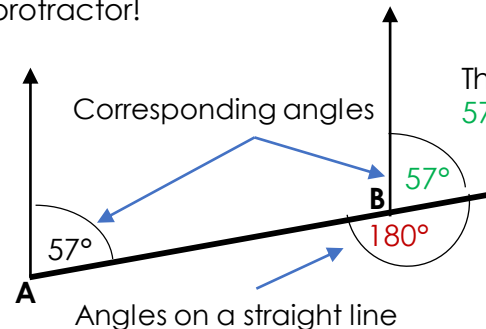
Therefore, the bearing of A from B is:
57° + 180° = 237°

57°

180°

57°

Angles on a straight line

Look at **Crossover U36 - Alternate and Corresponding Angles/Angle Facts** if you need help with the angle facts used here.

Other Topics/Units this could appear in:
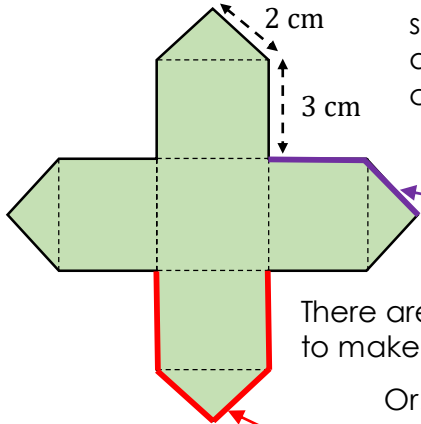
- Properties of Shapes
- Angle Facts
- Mensuration

Perimeter

Perimeter is the **distance** all the way around the **edge** of a shape.

By **counting edges** of **squares** along the **sides** of a shape on a grid, we can work out the perimeter of that shape.
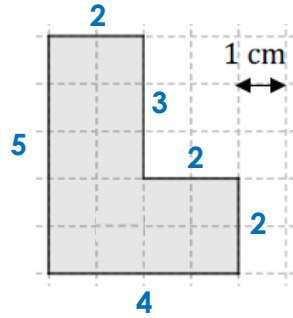
The perimeter of this L shape is 2 + 3 + 2 + 2 + 4 + 5 = 18 cm

For more complicated shapes, we can use different strategies to calculate the perimeter.

$8 \times (2 + 3)$ **cm**

There are 8 lots of 2cm + 3cm to make the whole perimeter.

Or…

$4 \times (2 + 2 + 3 + 3)$ **cm**

There are 4 lots of 2cm + 2cm + 3cm + 3cm to make the whole perimeter.

Area

Area is the amount of **space** inside a shape.

Area – counting squares

By **counting squares inside** a shape on a grid, we can work out the **area** of that shape.

For part squares, we can put these together to create whole squares. The purple triangle can be counted with the red trapezium to form a whole square.
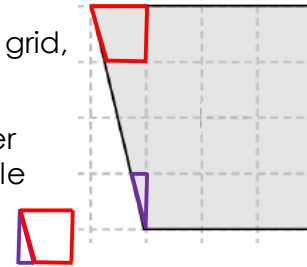
Area of a rectangle

We can calculate the area of a rectangle by multiplying:
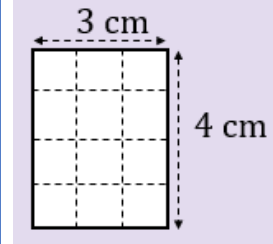
There are four rows, with three squares in each row. 4 × 3 = 12 so the area is 12 cm²

There are four rows, with seven squares in each row. 4 × 7 = 28 so the area is 28 cm²
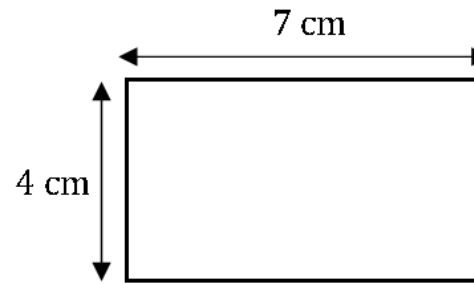
Compound Shapes

By splitting compound shapes into simple shapes, we can find the total area by adding the areas of the simple shapes.

There are two rectangles: 8 x 1 and 2 x 6, so the total area is 8 + 12 = 20 cm²

Keyword/Skill	Definition/Tips
Perimeter	Distance around the edge of a shape. Start and finish at the same point.
Area	The amount of space inside a shape. Measured in square units, such as cm², mm², m² …
Compound	Where more than one shape have been stuck together to form a new shape.
Centimetre	Metric unit of measurement for lengths.
Millimetre	Smaller unit of measurement than centimetres. 1cm = 10mm
Metre	Larger unit of measurement than centimetres. A door is about 2m tall. 100cm = 1m
Kilometre	Larger unit of measurement, usually used for distances between towns and cities in Europe. (The UK uses miles) 1000m = 1km

14

Year 8 – Maths – Unit GM3 – Area

Other Topics/Units this could appear in:
- Perimeter and Area
- Plans and Elevations
- Surface Area and Volume

Area of a Rectangle

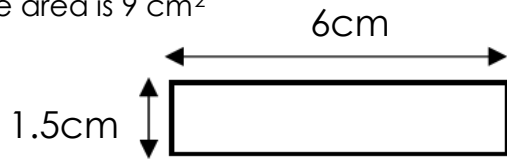The **area** of a **rectangle** is calculated by multiplying the **length** by the **width**.

Area of rectangle = length × width

The length is 6cm, the height is 1.5cm.
6 × 1.5 = 9 so the area is 9 cm²

6cm

1.5cm

Area of a triangle

The **area** of a **triangle** is calculated by multiplying the **height** by the **base**, then **dividing by 2**.

Area of triangle = $\frac{height \times base}{2}$

Two congruent triangles form a rectangle
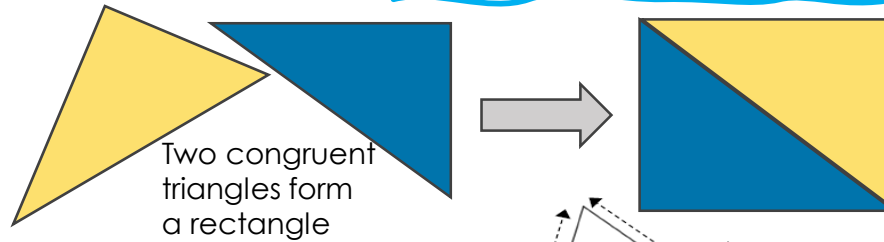
The height is 3cm, the base is 5cm.
$\frac{3 \times 5}{2}$ = 7.5 so the area is 7.5 cm²

3cm

6cm

5cm
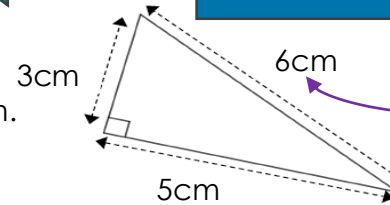
This 6 is not needed

Area of a parallelogram

The **area** of a **parallelogram** is calculated by multiplying the **perpendicular height** by the **base**.

A parallelogram can be split and rearranged to form a rectangle
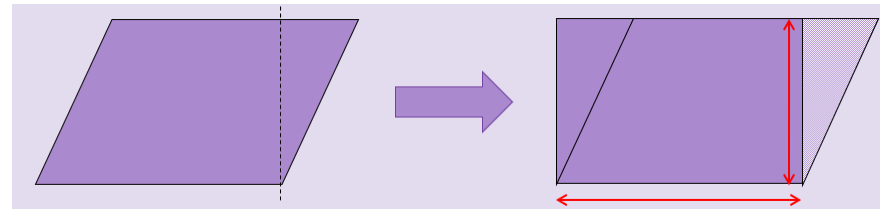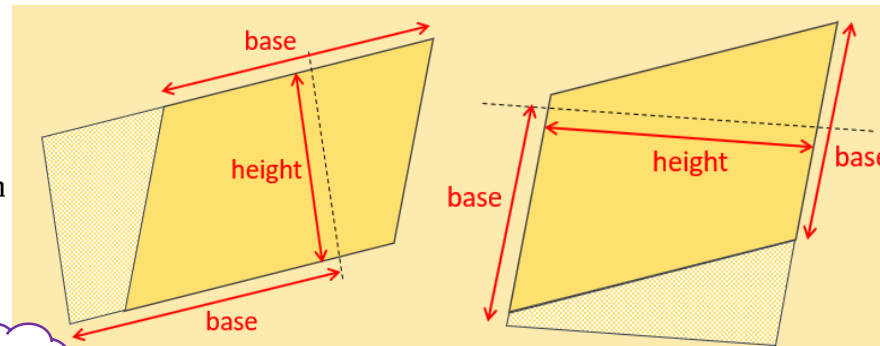
Area of parallelogram = height × base

The height is 6cm, the base is 6cm.
6 × 6 = 36 so the area is 36 cm²

6 mm

6 mm

7 mm

This 7 is not needed
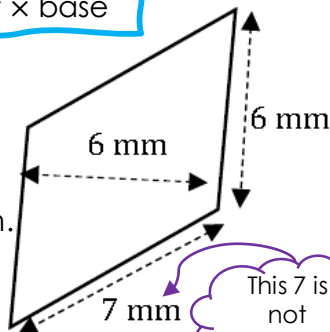
base

height

base

height

base

The height must be **perpendicular** to the base.

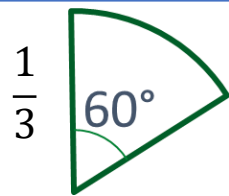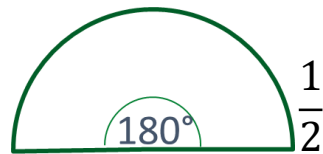| Keyword/Skill	Definition/Tips
Rectangle	4 right-angles 2 pairs of opposite equal parallel sides
Triangle	3 sides and 3 angles. Scalene, isosceles, equilateral, right-angled.
Parallelogram	2 pairs of equal parallel sides 2 pairs of opposite equal angles
Perpendicular	Meeting at right angles (90°)

15

Labelling a Circle

Diameter
Chord
Sector
Segment
Tangent

Diameter and Radius of a Circle

The diameter is double the size of the radius.
Example:
A circle has a radius of 16 cm. What is the diameter?
That means you need to double the radius: 16cm x 2 = 32cm
Diameter = 32cm

16cm radius
32cm diameter

Area of a Circle

r

Here is the formula for area of a circle:
Area = $\pi r^2 = \pi \times radius^2$

Example: Find the area of the circle.

6cm

Radius = 6cm

Area = $\pi r^2 = \pi \times 6^2$
= 36πcm^2 = 113.1cm^2

Parts of a circle

$\frac{1}{4}$ 90°

$\frac{1}{3}$ 60°

Quarter of a circle   A third of a circle

180° $\frac{1}{2}$

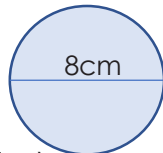A semi circle (half a circle)

Circumference of a Circle

The circumference of a circle is the distance around the circle. It is another name for the perimeter of a circle.

Circumference = π x diameter
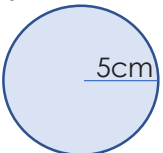Example: Find the circumference of this circle

Diameter = 8cm   8cm

Circumference = 8 x π
= 25.13cm (2d.p.)

You may be given the radius instead of the diameter, so you need to know the relationship between them (this information is stated above).

Example: 5cm

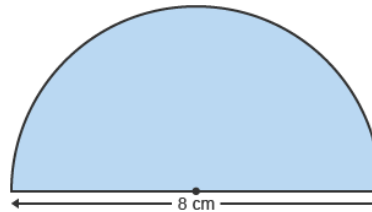Here the radius is 5cm.
Therefore the diameter = 5cm x 2 = 10cm

Circumference = 10cm x π
= 31.41cm (2d.p.)

Semicircles

The perimeter of a Semicircle:

Remember that the **perimeter** is the distance round the outside.
A semicircle has two edges. One is half of a circumference and the other is a diameter.
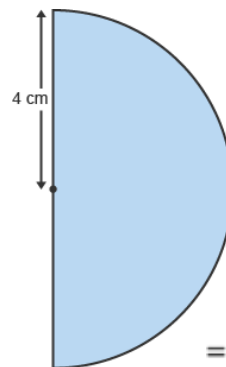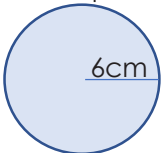
8 cm

$C = \pi d$
$= 3.14 \times 8$
$= 25.12cm$

Remember this is the circumference of the whole circle, so now we need to half this answer.

$25.12 \div 2 = 12.56cm$

Total Perimeter $= 12.56 + 8 = 20.56cm$

The Area of a Semicircle:

A semicircle is just half of a circle. To find the **area** of a semicircle we calculate the area of the whole circle and then half the answer.

4 cm

$A = \pi r^2$
$= 3.14 \times 4 \times 4$
$= 50.24cm^2$

$= 50.24 \div 2 = 25.12cm^2$

Keyword/Skill	Definition/Tips
Area	The size of a surface. The space inside a 2D surface.
Perimeter	The distance around a two-dimensional shape.
Formula	A rule or fact written with mathematic symbols.
Semi-Circle	It is half of a circle
Accuracy	How close a measured value is to the actual (true) value.
Surface Area	The total area of the surface of a three-dimensional object.
Segment	The smallest part of a circle made when it is cut by a line.
Arc	Part of the circumference of a circle or any curve.
Sector	A "pie-slice" part of a circle.
Circumference	The distance around the edge of a circle (or any curvy shape). It is a type of perimeter.
Radius	The distance from the centre to the circumference of a circle. It is half of the circle's diameter.
Diameter	The distance from one point on a circle through the centre to another point on the circle.
Pi	The ratio of a circle's circumference to its diameter. The symbol is π. π = 3.14159265358979323846... (the digits go on forever without repeating)
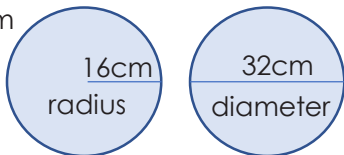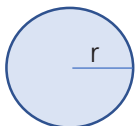
Other Topics/Units this could appear in:

- Properties of shape and simple angle facts
- Perimeter and Area
- Mensuration
- Similarity in 2D & 3D
- Circle Geometry – Gradients & Tangents
- Circle Theorems
- Coordinate Geometry and Circles

16
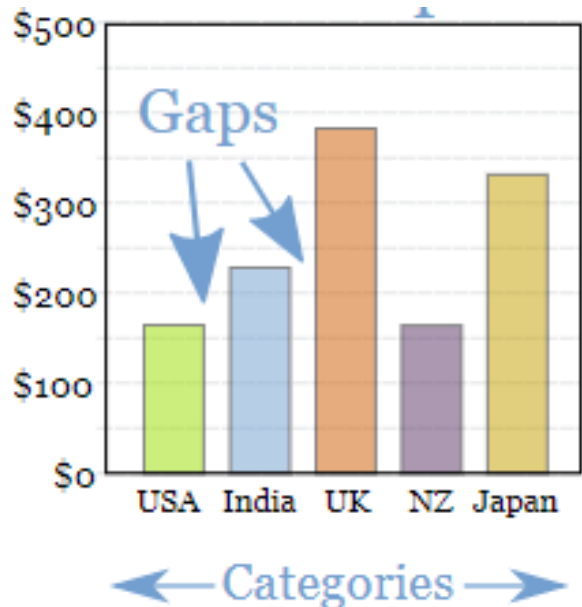
Bar Charts

- **Discrete data** can be represented using bar charts
- A bar chart is used to compare two or more values with a small set of results.
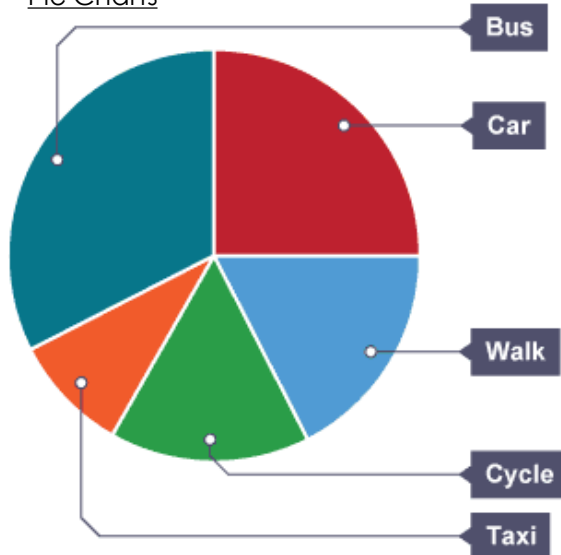- Bar charts show the absolute value of each category

Pie Charts

When you are graphing percentages of a distribution a pie chart would be suitable.

Pie charts clearly show the proportion of each category

- Pie charts use different-sized sectors of a circle to represent data.
- The angle of each sector represents the fraction, out of 360, assigned to that data value.
- Pie charts should always be labelled, either directly on the pie chart or by means of a colour-coded key.

Tally Charts

- A tally chart is a way to represent data.
- You are able to represent **qualitive and quantitative data.**
- You can have normal tally charts or grouped tally charts. These are also called frequency tables.

Tally chart with discrete data

Response	Tally	Frequency
0	⦀⦀⦀	13
1	⦀⦀	8
2	⦀⦀	4
3	⦀⦀	2
4		0
5		0
6 or more	⦀⦀	3

Grouped tally chart with continuous data

Response	Tally	Frequency
$x < 125$	⦀⦀	2
$125 \leq x < 135$	⦀⦀	2
$135 \leq x < 145$	⦀⦀	7
$145 \leq x < 155$	⦀⦀⦀	11
$155 \leq x < 165$	⦀⦀	6
$x \geq 165$	⦀⦀	2

Tally chart with quantitative data

Response	Tally	Frequency
White		0
Black	⦀⦀	7
Blue	⦀	1
Blonde	⦀⦀	4
Dark Brown	⦀⦀	9
Ginger	⦀⦀	3
Light brown	⦀⦀	6

Keyword/Skill	Definition/Tips
Discrete	Discrete data can only have a finite or limited number of possible values
Continuous	Continuous data can have an infinite number of possible values within a selected range
Quantitative	Quantitative data that can be counted (discrete), quantitative date that can be measured (continuous)
Qualitative	Information that describes something
Average	A calculated 'central value' of a set of numbers
Mean	The mean amount is the total amount split evenly
Median	Place the numbers in value order and then find the middle number. When there are two numbers in the middle we average them.
Mode	The number which appears most often in a set of numbers
Range	The difference between the highest and lowest values
Frequency	How often something happens.
Table	Information (such as numbers and descriptions) arranged in rows and columns.
Data	A collection of facts, such as numbers, words, measurements, observations or even just descriptions of things.
Proportion	A part, share, or number considered in comparative relation to a whole.
Univariate Data	Univariate means "one variable" (one type of data).

Other Topics/Units this could appear in:

- Averages
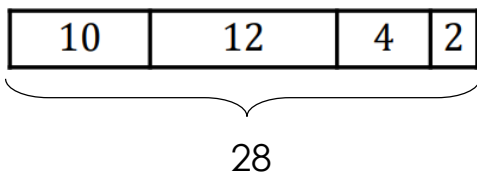- Averages from Tables
- Sampling
- Histograms

17

Calculating the Mean

The mean is the most commonly used measure of average. The mean is the total amount split evenly.
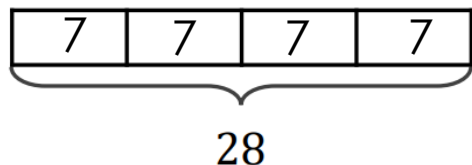
For example take this data set:

10. 12. 4. 2

I can represent this as a bar model:

| 10 | 12 | 4 | 2 |

28

The total is 28. I then want to split this amount evenly into how many values there are. In this case I need to split 28 into 4 even values.

| 7 | 7 | 7 | 7 |

28

Therefore the mean is 7!

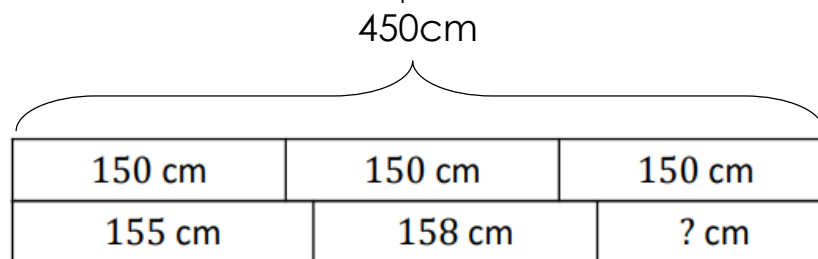You can also find missing values from data sets when given the mean.

Example:

Three children have a mean of 150cm.
Two children have a height of 155cm and 158 cm.
What is the height of the third child?

I can draw a bar model to help me out:

450cm

| 150 cm | 150 cm | 150 cm |
| 155 cm | 158 cm | ? cm |

I can see that the total would be 450cm so I can figure out the missing total:

155cm + 158cm = 313cm   450cm – 313cm = **137cm**

is the height of the third child

Calculating the Median

- If you place a set of numbers in order, the median number is the middle one.

  10   12   13   15   16   23   26

  15 is the middle number so it is the median.

- If there are two middle numbers the median is the mean of this

  10   12   13   15   16   17   23   26

  Here you need to find the number in the middle of 15 and 16:

  15 + 16 = 31   31 ÷ 2 = 15

  Therefore, 15.5 is the median.

Calculating the mode

- The mode is the value that occurs most often

Example:

1,3,3,4,7,8

The number 3 occurs the most so the mode is 3.

Calculating the Range

The range is the difference between the highest and lowest values in a set of numbers
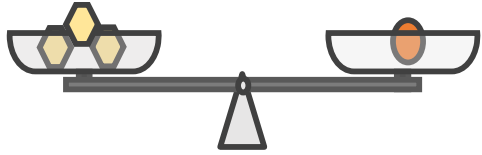
Find the range of:

23, 27, 40, 18, 25

The largest value is 40 and the smallest value is 23.

40 – 23 = 17

| Keyword/Skill	Definition/Tips
Discrete	Discrete data can only have a finite or limited number of possible values
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Mode	The number which appears most often in a set of numbers
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Frequency	How often something happens.
Table	Information (such as numbers and descriptions) arranged in rows and columns.
Data	A collection of facts, such as numbers, words, measurements, observations or even just descriptions of things.
Proportion	A part, share, or number considered in comparative relation to a whole.
Univariate Data	Univariate means "one variable" (one type of data).

Other Topics/Units this could appear in:

- Averages
- Averages from Tables
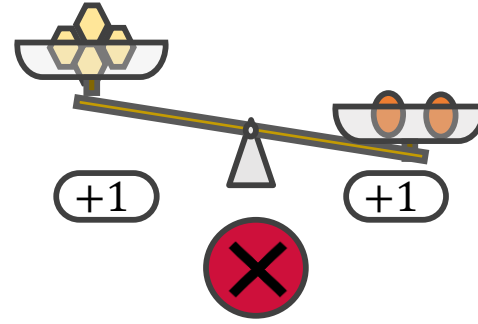- Sampling
- Histograms

18

Proportionality

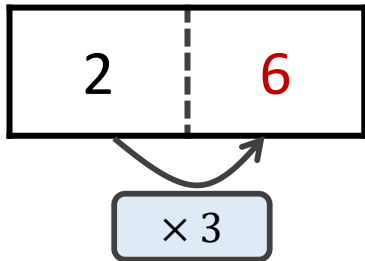These two quantities are balanced, therefore they are equal.
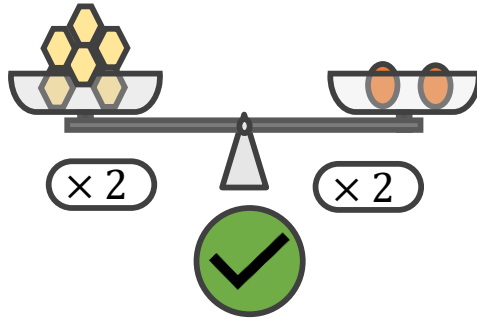
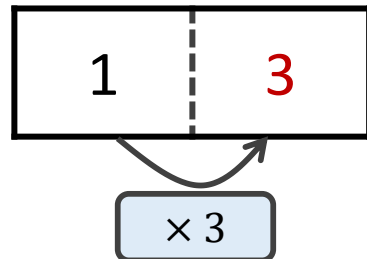I can find other quantities that are balanced by scaling each quantity.

If I add or subtract each side by the same quantity it is not balanced.

These relationships are called **multiplicative relationships** and the two quantities are **directly proportional**. This means there is a number we can multiply by to convert the measure.
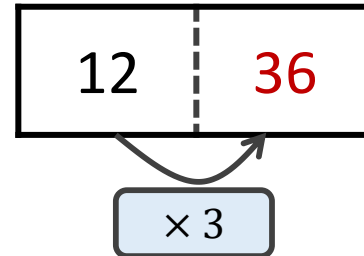
.

	Orange Circles	Yellow hexagons
	2	6

× 3

	Orange Circles	Yellow Hexagons
	1	3

× 3

	Orange Circles	Yellow Hexagons
	12	36

× 3

Keyword/Skill	Definition/Tips
Ratio	Shows the relative sizes of two or more values. E.G. 1 boy and 3 girls would be written as 1:3
Inverse	The opposite or the reverse E.g. the inverse of addition is subtraction.
Proportion	Two ratios or fractions that are equal.
Direct Proportion.	Two quantities change in the same way. When one increases or decrease, so does the other one.
Equation	Says that two things are the equal. (1+1=2).
Linear	A graph that has a straight line.
Substitute	Putting values where the letters are.
Constant of Proportionality	A constant value relating to amounts that rise or fall uniformly together.
Scaling	Multiplying or dividing two quantities by the same number
Multiplicative Relationship	A relationship where two quantities can be expressed as a multiple of each other.

Other topics/units this may appear in:
- Fractions
- Percentages
- Best Value
- Exchange Rates
- Proportion Recipes
- Straight Line Graphs
- Direct & Inverse Proportion

19

Year 8 – Maths – NP10 – Proportional Reasoning

Constant of Proportionality

If two quantities are directly proportional, the multiplier between them is called the **constant of proportionality**.

Example:

lbs	oz
1	16
5	

Pounds (lbs) and ounces (oz) are directly proportional.

lbs	oz
1	16

× 16

Therefore, 16 is my constant of proportionality.

lbs	oz
1	16
5	**80**

× 16

Unitary Method

Sometimes the constant of proportionality is more challenging to find.
If we scale it down to 1, then it is easy to then scale up to the quantity we need!

Eggs	Cost (£)
8	20
50	?

Eggs		Cost (£)
8	1	20

÷ 8   × 20

Eggs		Cost (£)
8	1	20
50	6.25	**125**

÷ 8   × 20

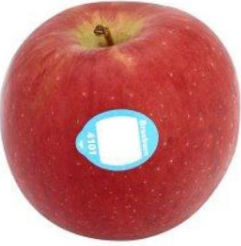| Keyword/Skill	Definition/Tips
Ratio	Shows the relative sizes of two or more values. E.G. 1 boy and 3 girls would be written as 1:3
Inverse	The opposite or the reverse E.g. the inverse of addition is subtraction.
Proportion	Two ratios or fractions that are equal.
Direct Proportion.	Two quantities change in the same way. When one increases or decrease, so does the other one.
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Linear	A graph that has a straight line.
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Constant of Proportionality	A constant value relating to amounts that rise or fall uniformly together.
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Other topics/units this may appear in:
- Fractions
- Percentages
- Best Value
- Exchange Rates
- Proportion Recipes
- Straight Line Graphs
- Direct & Inverse Proportion

20

Year 8 – Maths – NP10 – Proportional Reasoning

Best Buys: Work out how much money **one item** costs. The best value is the **cheapest**.

A
1.2kg for £3.89

B
700g for £2.14

Step 1 - For offer A, Convert 1.2kg to grams by multiplying by 1000 so that we have both offers in grams.

Step 2 - If 1200g of Apples costs 389p (or £3.89) we can work out 1g by dividing the grams and the money by 1200.

Step 3 - For offer B, If 700g costs 214p (or £2.14) we can work out 1g by dividing the grams and the money by 700.

Step 4 - See which is the lowest cost per gram and that is the best value.

1.2kg = £3.89
÷ 1200 1200g = 389p ÷ 1200
1g = 0.32p

÷ 700 700g = 214p ÷ 700
1g = 0.31p

Note: If you leave the money in £'s, for offer A, 1g = £0.0032 and for offer B, 1g = £0.0031. The answer is still the same. Offer B is cheapest.

Offer B is the best value.

Eg2. Which is better value?

SHAMPOO

TRESCO Supermarket Sells 500ml bottles for £1.60
Special Offer 3 for price of 2

ASDER Supermarket sells 300ml bottles for £1.50
Special offer buy one get one free

TRESCO:
x 3 500ml = £1.60 x 3
÷ 1500 1500ml = £3.20 ÷ 1500
1ml = £0.0021

ASDER:
x 2 300ml = £1.50
÷ 600 600ml = £1.50 ÷ 600
1ml = £0.0025

TRESCO is the best value

Step 1 - At Tresco, the offer is 3 bottles of 500ml for the price of 2 bottles. Therefore 3 x 500ml costs 2 x £1.60

Step 2 – So if 1500ml of Shampoo costs £3.20, we can work out 1ml by dividing the ml and the money by 1500.

Step 3 - At ASDER, the offer is buy 1 and get 1 free. Therefore we get 2 x 300ml for 1 x £1.50

Step 4 - If 600ml costs £1.50 we can work out the cost of 1ml by dividing the ml and the money by 600.

Step 5 – Now see which is the lowest cost per ml of shampoo and that is the best value. – In this example TRESCO is the cheapest/best value.

Keyword/Skill	Definition/Tips
Best Buy	The cheapest price per item/unit OR the highest number of units/price .
Direct Proportion	2 variables change at the same rate
Unitary Method	Finding the cost of a single unit OR finding the amount of units per eg. £1
Exchange Rate	The price of one currency in terms of another currency. Eg. £1 = $1.25 For each pound I have to spend I can buy $1.25
Multiply	Repeated addition.
Divide	To split into equal parts or groups.
Changing Format	If the rate is given in the format (for instance) $1 = £0.85 Divide both numbers by 0.85 to get the exchange rate in the format £1 = $1.18

Other Topics/Units this could appear in:

- Direct and Inverse Proportion
- Similarity
- Mensuration
- Fractions and Percentages

21

Keyword/Skill	Definition/Tips
Best Buy	The cheapest price per item/unit OR the highest number of units/price .
Direct Proportion	2 variables change at the same rate
Unitary Method	Finding the cost of a single unit OR finding the amount of units per eg. £1
Exchange Rate	The price of one currency in terms of another currency. Eg. £1 = $1.25 For each pound I have to spend I can buy $1.25
Multiply	Repeated addition.
Divide	To split into equal parts or groups.
Changing Format	If the rate is given in the format (for instance) $1 = £0.85 Divide both numbers by 0.85 to get the exchange rate in the format £1 = $1.18

Exchange Rates: One currency can be exchanged for another currency by calculations using exchange rates.

Example 1
John went to Paris on holiday. He changed £1450 into Euros at Manchester Airport before his flight to Paris. The exchange rate at the airport was £1 = €1.14. On the holiday he spent €1355. On his return to England he changed his remaining euros back into pounds. Work out how much he returned to England with. Give your answer in pounds to the nearest penny.

£1   =   €1.14

£1450 = 1450 x 1.14 = €1653

€1653 - €1355 = €298

298 ÷ 1.14 = £261.4035……

= £261.40 (nearest penny)

Step 1 - For EVERY pound John receives he gets €1.14. Therefore, for £2 he gets 2 x €1.14, for £3 he gets 3 x €1.14 etc so for £1450 he gets 1450 x €1.14 = €1653

Step 2 - On holiday in Benidorm he spends € 1355 so the next thing we do is subtract 1355 from 1653 which is €298

Step 3 - When we changed from pounds to euros we used multiplication, so to convert back from euros to pounds we do the inverse of multiplication ie. division.

Therefore the calculation is 298 ÷ 1.14 = £261.4035 which is £261.40 to the nearest penny

Note: When the exchange rate is given as £1 = "other currency" then

GBP → Other currency   x   exchange rate
GBP ← Other currency   ÷   exchange rate
Otherwise: Reverse the operations. See eg2.

Example 2
Elaine is going to New York. She wants to change £500 into US Dollars. The exchange rate in the UK is £1 = $1.26 and the exchange rate in New York is $1 = £0.81. In which country is she best changing her money? Explain your answer.

UK : 500 x 1.26 = $630

US (New York) : 500 ÷ 0.81 = $617.28

She should change her money in the UK because she will get more dollars.

Step 1 - If Elaine changes her money in the UK, for every
£1 she gets $1.26
£2 she gets 2 x $1.26
£3 she gets 3 x $1.26 etc

so for £500 she gets 500 x $1.26 = $630

Step 2 - If Elaine changes her money in New York, even though she is changing pounds to dollars the calculation is "divided by the exchange rate" because the exchange rate in New York is given as $1 = £0.81
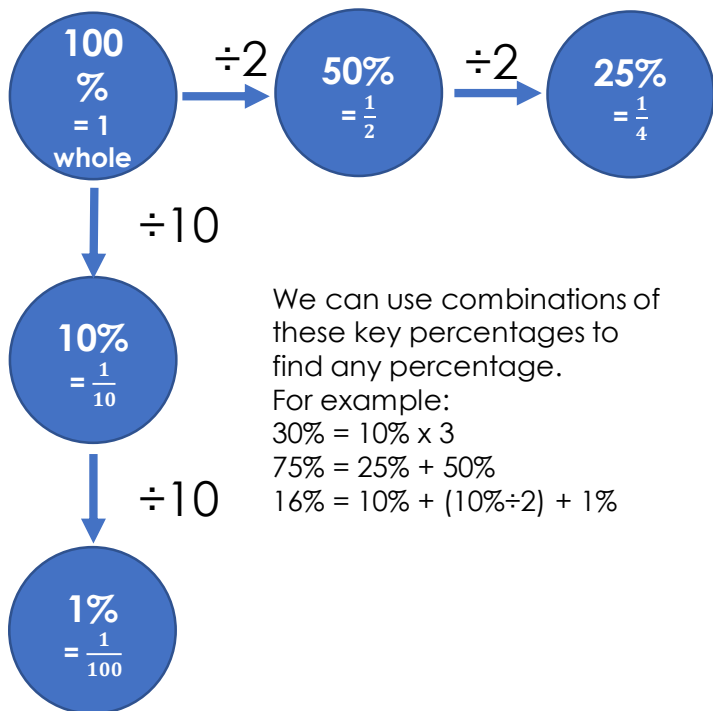
Exams!
- As you can see, these questions are all about money, so make sure in an exam you use the correct units, e.g £ or $ etc.
- You also need to make sure all of your answers are rounded to 2.d.p, as money is always in this form.

Other Topics/Units this could appear in:

- Drawing and Interpreting tables and graphs
- Expressions and substitution into simple formulae

22

1. Percentage of an Amount (without a calculator)

100% = 1 whole

÷2 → **50%** = $\frac{1}{2}$

÷2 → **25%** = $\frac{1}{4}$

÷10 → **10%** = $\frac{1}{10}$

÷10 → **1%** = $\frac{1}{100}$

We can use combinations of these key percentages to find any percentage.
For example:
30% = 10% x 3
75% = 25% + 50%
16% = 10% + (10%÷2) + 1%

Example 1:
Find 25% of £120
To find 25% you divide by 2 then divide by 2 again (or ÷ 4)
£120 ÷ 4 = £30
So, 25% of £120 is £30

Example 2:
Find 60% of 300kg
To get 60% we can use 50%+10%
To find 50% you divide by 2
So 50% = 150kg
To find 10% you divide by 10
So 10% = 30kg
Therefore 60% of 300kg = 180kg

2. Percentage increase/decrease (without a calculator)
Firstly, find the percentage of the given amount.
Then you add or subtract this amount depending on whether you are increasing or decreasing.

Example 1
Increase $80 by 50%

50% of $80 = $40
Then **add** this onto the starting amount

$80 + $40 = $120

Example 2
Decrease 500g by 3%

1% of 500g = 5g
3% of 500g = 5g x 3 = 15g
Then **subtract** this from the starting amount

500g – 15g = 485g

3. Percentage of an Amount (with a calculator)
Here we can use **percentage multipliers**.
First of all you need to find the decimal equivalent of the percentage you need.

50%	=	0.5
75%	=	0.75
30%	=	0.3
2%	=	0.02

You need to use these decimals as percentage multipliers.
Example
Find 48% of £250
48% = 0.48 (this is the percentage multiplier)
250 x 0.48 = 120
So, 48% of £250 is £120

4. Percentage Increase/Decrease (with a calculator)
Here we can also use **percentage multipliers.**

Increasing Example
Increase 480 by 16%.
Every amount starts at 100%. If I want to **increase** by 16%, this would go up to 116%.
So I need my multiplier to be the decimal equivalent of 116%
116% = 1.16
So to increase 480 by 16%
480 x 1.16 = 556.8

Decreasing Example
Decrease 725 by 26%.
Every amount starts at 100%. If I want to **decrease** by 26% this would go down to 74%. (100 – 26 = 74)
So I need my multiplier to be the decimal equivalent of 74%.
74% = 0.74
So to **decrease** 725 by 26%
725 x 0.74 = 536.5

Keyword/Skill	Definition/Tips
Percentage	A number out of 100. Symbol %
Fraction	Any part of a group, number or whole. They are written as one number over another.
Decimal	A number with a decimal point in it. It can be positive or negative. 3746.374
Equivalent	Having the same value or amount.
Increase	To get larger in size or number.
Decrease	To get smaller in size or number.
Profit	This occurs when an item is sold for more than it cost to buy. It is the difference between the amount earned and the amount spent.
Loss	This occurs when an item is sold for less than it cost to buy.
Interest	Money paid regularly at a particular rate. Usually on bank accounts or loans.
Percentage multiplier	The number you multiply a quantity by to find a percentage or increase/decrease it by a percentage.
Simple Interest	Interest calculated as a percentage of the original amount.
Compound Interest	Interest paid on the original amount and the accumulated interest.
Decay/ Depreciation	The decrease in the value or amount of something over time. (Car prices are a common example)
Growth/ Appreciation	The increase in the value or amount of something over time. (House prices are a common example)

23

5. Interest, Growth and Decay

Simple Interest (Growth)	A £200 loan earns 15% **simple** interest over 5 years. How much will be owed at the end of the 5 years? Work out 15% of £200 = £30 £30 x 5 years = £150 £200 + £150 = £350
Compound Interest (Growth)	A £200 loan earns 15% **compound** interest over 5 years. How much will be owed at the end of the 5 years? Here you need to use percentage multipliers. To **increase** by 15% five times (for each of the 5 years) you would multiply by 1.15 five times. A quick way of writing this is by using indices. $£200 \times 1.15^5 = £402.27$
Compound Depreciation (Decay)	A car was brought for £12,000. It depreciates in value by 20% per year. How much will the car be worth after 3 years? Here you need to use percentage multipliers. To **decrease** by 20% three times (for each of the 3 years) you would multiply by 0.8 three times. A quick way of writing this is by using indices. $£12,000 \times 0.8^3 = £6,144$

6. Reverse Percentages

Reverse percentages help us to calculate the **original** price or value of something, when we only know the price or value after the increase or decrease has taken place.

Before we do this, it is important we know that 100% represents the whole amount or the full price of something. So if something is increased by 20%, the amount we have now is worth 120%. If something is reduced by 5%, the amount we have is now worth 95%.

Non – Calculator This could come up on a non-calculator paper, but they will usually give you nice numbers that will divide easily like the example here.	A shop has a 20% off sale. A shirt is now worth £24. What was the original price? So, £24 represents 80% of the value of the shirt 80% + 20% = 100% £24 + £6 = £30
Calculator On a calculator paper, the numbers are likely to be more difficult, so you will need to use percentage multipliers.	Some money has been put into a bank account with an interest rate of 4%. After a year, the total amount of money in the account was £291.20. How much money was invested? £291.20 ÷ 1.04 = £280

Sometimes, the phrase 'per annum' is used. This means the same as 'per year'. Annum is the Latin word for year.

Exams!
- A lot of these questions will involve money. Remember money should always be rounded to 2d.p.

Other Topics/Units this could appear in:

- Direct and inverse proportion
- Ratio
- A-level Units

24

ORMISTON SWB ACADEMY

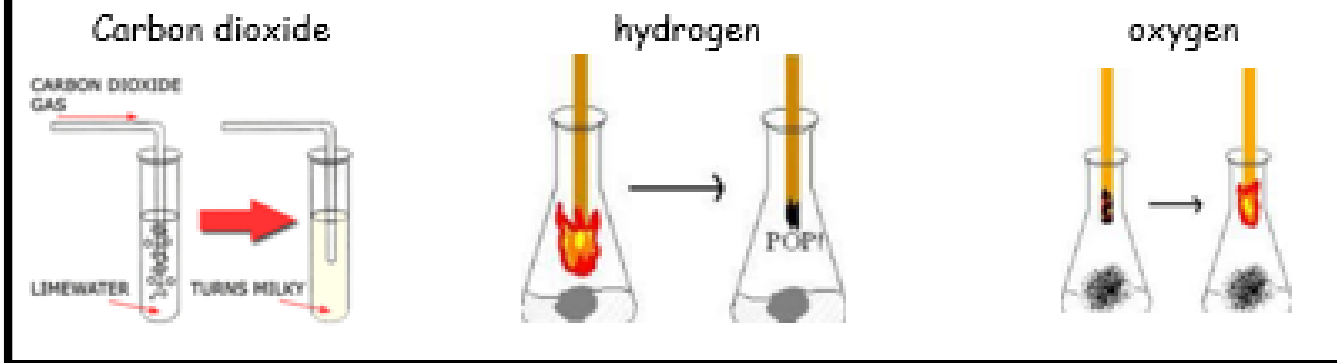| Physical change (Reversible)	Chemical change (Irreversible)
For example – melting chocolate Freezing water into ice	For example – frying an egg - rusting
No new substances or products formed. There has just been a change of state (solid, liquid, gas)	One or more new substances has been formed.

Element   Element   Compound   Mixture   Mixture

$$2 H_2 + O_2 \longrightarrow 2 H_2O$$

reactants   products
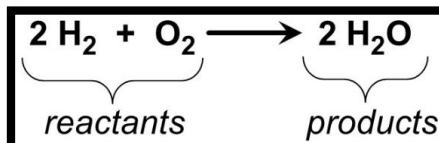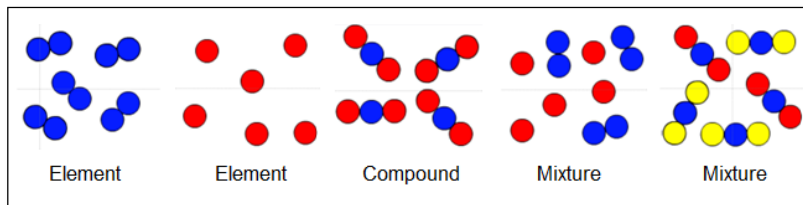
A **chemical reaction** is a change in which **atoms are rearranged** to create new substances

Atoms

Elements   Molecules

Compounds   Mixtures
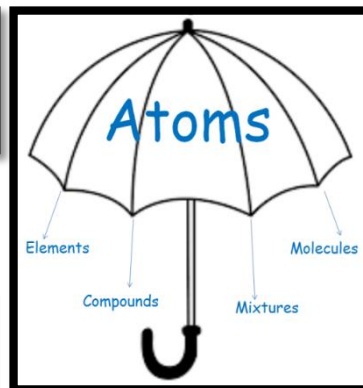
Name of compound	Symbol	Elements present
Carbon dioxide	CO_2	1 x Carbon and 2 x Oxygen

Gas testing

Carbon dioxide — CARBON DIOXIDE GAS — LIMEWATER — TURNS MILKY

hydrogen — POP!

oxygen

Acid	Name of salt
Hydrochloric	Chlor**ide**
Sulfuric	Sulf**ate**
Nitric	Nit**rate**

Metal/compound	Acid	Name the products made
Magnesium Mg	sulfuric acid H_2SO_4	Magnesium sulfate + hydrogen $MgSO_4 + H_2$
Iron carbonate $FeCO_3$	nitric acid HNO_3	Iron nitrate + carbon dioxide + water $FeNO_3 + CO_2 + H_2O$
Zinc oxide ZnO	hydrochloric acid **2**HCl	Zinc chloride + water $ZnCl_2 + H_2O$
Aluminium	sulphuric acid	Aluminium sulfate + hydrogen

Actual yield	The quantity (amount) of a product that is obtained from a chemical reaction.
Chemical	A substance – such as reactants and products used or made in a chemical reaction.
Conduction	The process by which heat, or electricity is transmitted through solids.
Convection	The movement of heat through fluids and liquids.
Elastic potential	Elastic potential energy is stored in stretched or squashed materials. When a rubber ball is stretched or squashed, it can regain its shape again.
Electrical	An electric current is a flow of charge, and in a wire, this will be a flow of electrons.
Energy	Energy cannot be created or destroyed. It can be stored, or it can be transferred
Gravitational potential	When an object is moved higher, it gains gravitational potential energy.
Joule	The scientific unit for energy is the joule.
Kinetic	All moving objects will have movement (kinetic) energy.
Light	The brightness that comes from objects such as a light bulb, or a torch.
Non-renewable	Energy resources that cannot be replaced once they are all used up.
Nuclear	Nuclear fuels release energy through nuclear reactions, rather than through chemical reactions.
Percentage composition	Percentage composition of a compound is a ratio of an amount of each element to the total amount of individual elements in a compound,
Percentage yield	The percent ratio of actual yield to the theoretical yield. It is calculated to be the experimental yield divided by theoretical yield multiplied by 100%.
Radiation	A method of transferring heat when no particles are involved.
Relative atomic mass	Relative atomic mass of an element is the average mass of its atoms, compared to 1/12th the mass of a carbon-12 atom
Relative formula mass	The relative formula mass of a substance made up of molecules is the sum of the relative atomic masses of the atoms in the numbers shown in the formula.
Renewable	Energy resources can be replaced and will not run out.
Sound	Vibrations that travel through the air or another medium and can be heard when they reach a person's or animal's ear.
Theoretical yield	The maximum possible mass of a product that can be made in a chemical reaction.
Thermal	Heat energy.
Transformation	Changing a substance into another substance

25

Reactivity series (increasing reactivity, top to bottom):
potassium, sodium, calcium, magnesium, aluminium, zinc, iron, lead, copper, silver, gold

Please send Charlie's monkeys and zebras in lead cages securely guarded!

Metal	Oxygen	Name the products made
Lithium $2Li$	Oxygen O_2	Lithium oxide $2LiO$
Magnesium $2Mg$	Oxygen O_2	Magnesium oxide $2MgO$

Displacement reactions involve a metal and a compound of a different metal. In a displacement reaction: a more reactive metal will **displace** a less reactive metal from its compounds.
For example, magnesium is more reactive than copper. When a piece of magnesium is dipped into blue copper sulfate solution: the blue colour fades as colourless magnesium sulfate solution forms brown copper coats the surface of the magnesium. A reactivity series helps you to work out if a displacement reaction will take place.

EXOTHERMIC REACTION. Heat energy RELEASED from reaction TO surroundings. Temperature increase . Surroundings get hotter. Examples – combustion, neutralisation
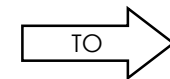
TO → surroundings

ENDOTHERMIC REACTION. Heat energy ABSORBED FROM surroundings to reaction. Temperature decrease. Surroundings get cooler / Examples – thermal decomposition

FROM ← surroundings

Relative atomic mass
- of an element shows its mass **compared** with the mass of atoms of other elements. The RAM of carbon is 12, while the relative atomic mass of magnesium is 24. This means that each magnesium atom is **twice** the mass of a carbon atom. The relative atomic mass of each element can be found in the **periodic table**.
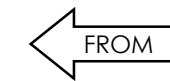
Collision Theory
- **To react**: particles must **collide** with enough energy.
- **To increase rate**: increase the **amount** of collisions or the **energy** of the collisions.
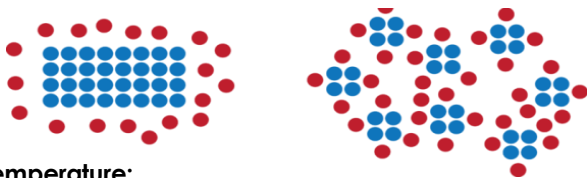
Effect of Concentration:
- Increasing concentration increases the number of reacting particles.
- This increases the number of collisions.

Increase concentration
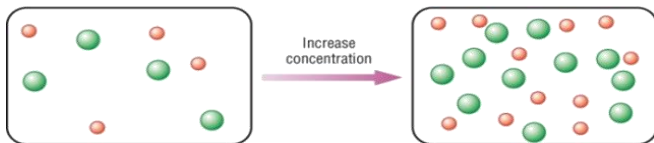
Effect of Surface Area:
- Increasing the surface area increases the proportion of (solid) particles available to react.
- This increases the number of collisions.

Effect of Temperature:
- Increasing the temperature increases the speed that particles are moving
- This means there are more collisions, and those collisions have more energy.
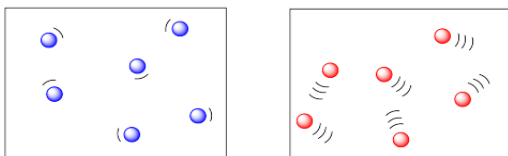
Combustion

Complete	Incomplete
Combustion takes place in lots of oxygen Products – carbon dioxide and water	Combustion takes place in limited oxygen supply Products – carbon monoxide + carbon + water

Catalysts

- **Catalysts:** increase the rate of a reaction without getting used up.
- Catalysts are often used in industry to speed up chemical processes.
- When a catalyst is added to a reaction the same amount of product is formed, but in a shorter period of time
- Enzymes are biological catalyst and enzymes are used in the production of alcoholic drinks.

Calculating relative formulae mass

- Calculate the relative formula mass of the compound with the formula: H_2SO_4
- Answer (H = 1, S = 32, O = 16)

H_2SO_4

$(2 \times H)$ $(1 \times S)$ $(4 \times O)$
(2×1) (1×32) (4×16)

2   32   64
$2 + 32 + 64 = 98$

Percentage composition by mass
1. Work out the *relative formula mass* of a compound. 2. Work out the mass of the element that we are interested in. 3. Divide the mass of the element by the relative formula mass of the compound and multiply it by 100.

$$\% \text{ mass} = \frac{\text{Total mass of element}}{\text{Relative formula mass}} \times 100$$

Yield

- **Theoretical yield:** the amount of product you would expect.
- **Actual yield:** the amount of product you actually get in practice.
- **Percentage yield:** the proportion of the theoretical yield that you actually achieve.

$$\% \, Yield = \frac{actual \; yield}{theoretical \; yield} \times 100$$

% yield is always less than 100 because:
- The reaction may be incomplete
- Some product may be lost during the steps to prepare it.
- Some reactants may also produce products other than the desired one.

26

Mendeleev's periodic table

The main groups are numbered from 1 to 7 going from left to right, and the last group on the right is group 0. The section in the middle of the table is called the Transition Metals.

The zig-zag line in this diagram separates the metals, on the left, from non-metals, on the right. Hydrogen is a non-metal but it is often put in the middle.

Modern day periodic table

Non-metals

Metals

Each element has its own chemical symbol, made from letters. Remember that you will only find elements in the periodic table and never compounds. So you won't find substances like water or copper sulfate in the periodic table.

Columns going down are called **groups**. Elements in a group have similar properties.
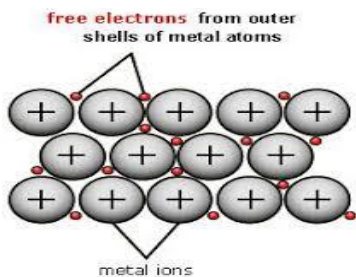
Rows going across are called **periods**.

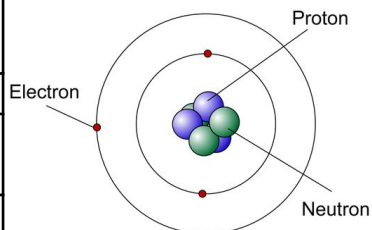| Keyword	Definition
Element	*An element is a substance that cannot be broken down into any other substance. Every element is made up of its own type of atom.*
Period	*A horizontal row on the periodic table.*
Group	*A vertical column on the periodic table.*
Mendeleev	*A Russian scientist called Dmitri Mendeleev produced one of the first practical periodic tables in the 19th century.*
Atomic mass	*The mass of a single atom of a chemical element. It is calculated as the number of protons and neutrons.*
Lustrous	*A material that is shiny.*
Sonorous	*A material that capable of producing a deep or ringing sound.*
Ductile	*A material that may be stretched into a wire.*
Malleable	*A material that can bend without breaking.*
Reactivity	*The tendency of a substance to undergo a chemical reaction.*
Halogens	*Group 7 in the periodic table.*
Atoms	*The smallest part of an element that can exist*
Metal	*A substance found on the left hand side of the periodic table.*
Non-metal	*A substance found on the right hand side of the periodic table.*
Alloy	*A mixture of elements, including at least one metal.*
Pure	*A pure element or compound contains only one substance, with no other substances mixed in.*
Impure	*Impure materials may be mixtures of elements, mixtures of compounds, or mixtures of elements and compounds that are not chemically combined.*
Displacement	*A more reactive metal will displace a less reactive metal from its compounds.*
Density	*The density of an object or substance is its mass divided by its volume: Density = Mass ÷ Volume.*
Alkali metals	*Group 1 in the periodic table.*

27

Metal and non-metal properties

	Metal	Non-metal
Appearance	Shiny	Not shiny
Hardness	Hard	Soft
Brittle	No	Yes
Malleable (can be moulded/bent)	Yes	No
Ductile (can be made into wire)	Yes	No
Conducts heat	Yes	No
Conducts electricity	Yes	No
Density	High	low

	Reactivity	Reaction with water	Boiling point (ºC)	Melting point (ºC)
Lithium	Least reactive	Fizzes steadily, moves around, gradually disappears	1342	181
Sodium	reactive	Fizzes rapidly, moves quickly, becomes a sphere, disappears quickly	883	98
Potassium	Very reactive	Ignites with a lilac flame, moves very rapidly, disappears very quickly	760	63

Alkali metal + water → metal hydroxide + hydrogen

Sodium + water → sodium hydroxide + hydrogen

Potassium + water → potassium hydroxide + hydrogen

Metallic structure vs alloy structure
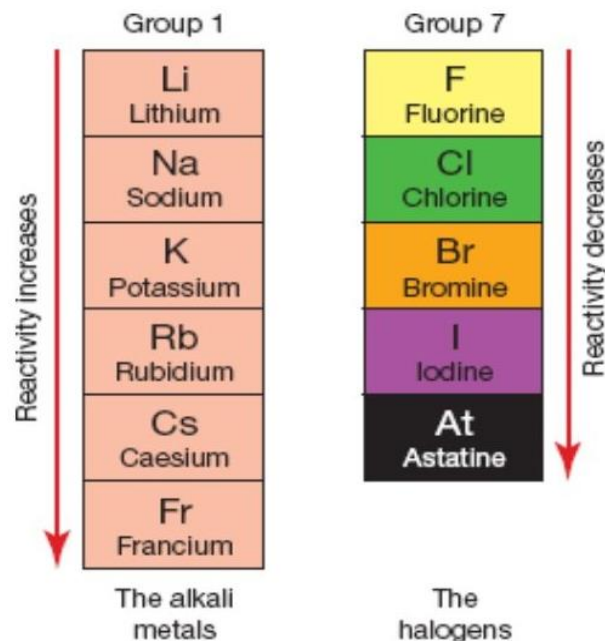

free electrons from outer shells of metal atoms

metal ions

Proton

Electron

Neutron

Alloys have **different sized atoms,** and because of this there are **no layers** like in pure metals. In an alloy it is not as easy to push one layer (row) of atoms over another. This makes alloys stronger than pure metals.

Reactivity of group 1 alkali metals and group 7 halogens

Group 1

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

The alkali metals

Group 7

F Fluorine
Cl Chlorine
Br Bromine
I Iodine
At Astatine

The halogens

Reactivity increases
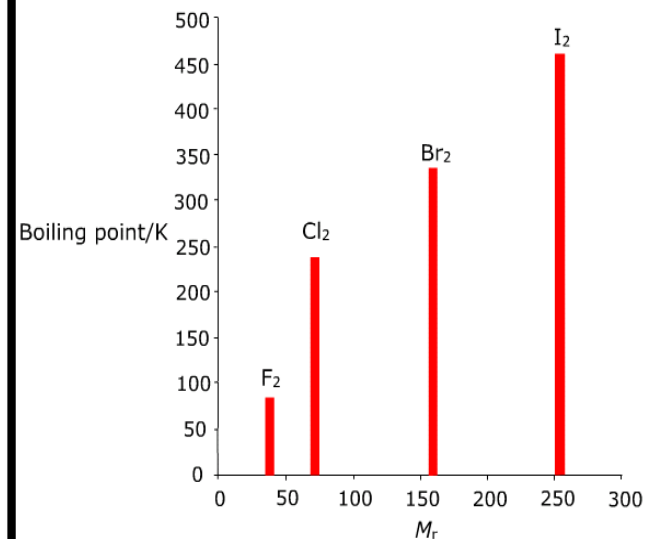
Reactivity decreases

As you go down Group 1, the reactivity of the alkali metals increases.

As you go down Group 7, the reactivity of the halogens increases.

Halogens: The strength of the forces between the molecules of the halogens increases as the size of the molecules increases, so the boiling point increases as it requires more energy to overcome these forces.

Boiling points of Group 7 elements

Boiling point/K

M_r

Halogen displacement
*A more reactive halogen can displace a less reactive halogen from solution of its salts.*

Example:
Chlorine + sodium bromide → sodium chloride + bromine

Iodine + potassium bromide → no reaction

28

Year 8 – Science – C2c. Earth Science

Keyword	Definition
Rock Cycle	A continuous cycle of recycling rocks over millions of years due of processes such as weathering, erosion and large earth movements.
Fossils	The preserved remains or traces of a dead organism.
Crystals	Molecules or particles of a substance fit together in the repeating pattern.
Layers	A sheet/quantity of a material that covers a surface
Erosion	The movement of broken pieces of rocks away from the site of weathering
Sand	Very small pieces of old rocks that have been weathered and eroded
Extrusive	Igneous rock that is formed by lava, outside the volcano, has small crystals because it has cooled quickly
Intrusive	Igneous rock that is formed by magma, inside the volcano, has large crystals because it has cooled slowly.
Weathering	The mechanical breakdown of rocks on the Earth's surface by the action of weather, temperature or biological activity
Porous	A rock that has small gaps between the grains/particles that allow water/air to pass through them
Recycle	The process of turning used waste and materials into new products.

Rocks can be classified in to three main groups - igneous, sedimentary and metamorphic.

| Igneous	Sedimentary	Metamorphic
Granite	Limestone	Marble
These rocks are a result of volcanic activity in the past. Rocks were formed from lava. Some cooled on the surface of the Earth, and some deep in the Earth.	These are made up of small particles of sand and rock, which have been transported by the wind, rivers and ice and are usually deposited on lake or seabed.	These are rocks that have been changed in shape and form by intense heat and pressure
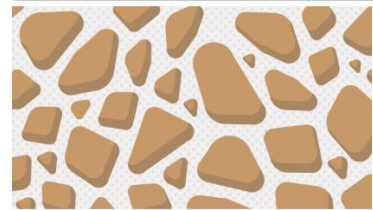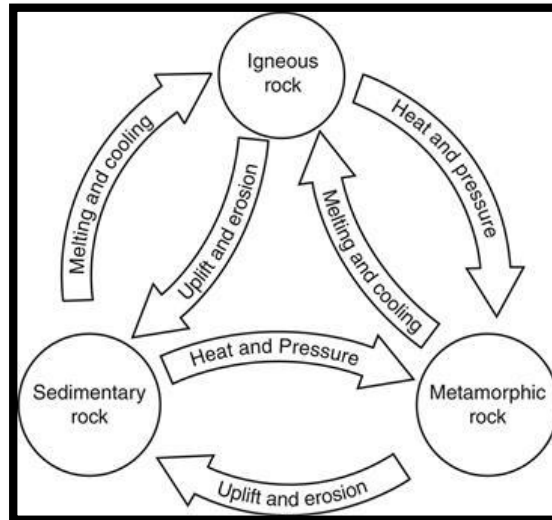
Rounded grains (rock is porous and crumbly)
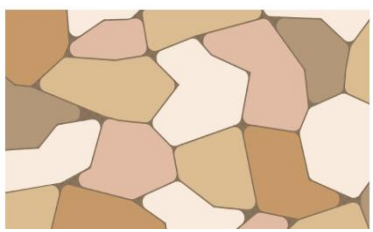
Interlocking grains – crystals (rock is hard)

A fossil is the preserved remains or traces of a dead organism. The process by which a fossil is formed is called fossilisation.

It's very rare for living things to become fossilised. Usually after most animals die their bodies just rot away and nothing is left behind. However, under certain special conditions, a fossil can form.

	Extrusive igneous rock	Intrusive igneous rock
Where magma cooled	On the surface of the Earth	Underground
How fast magma cooled	Quickly	Slowly
Size of crystals	Small	Large
Example	Basalt	Granite

The Carbon Cycle
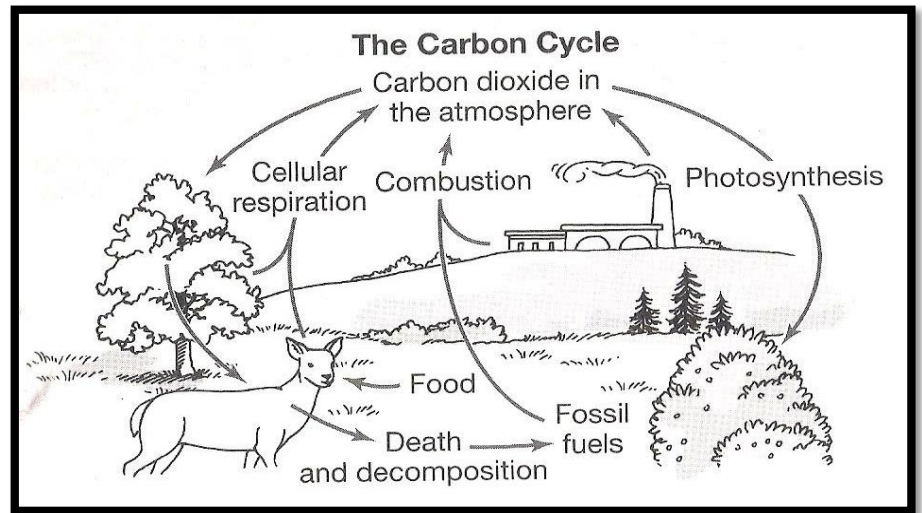
Wind, rain and waves can all cause weathering. The wind can blow tiny grains of sand against a rock. These wear the rock away and weather it. Rain and waves lashing against a rock can also wear it away over long periods of time.

If water gets into a crack in a rock and then **freezes**, it **expands** and pushes the crack further apart. When the ice melts later, water can get further into the crack. When the water freezes, it expands and makes the crack even bigger.

Developing ideas/artist research
Using resources – testing out ideas/media.
Making a personal response – final outcome.

How do I identify the formal elements of Sandra Chevrier's work to create a written analysis?
- Artist's information/nationality.
- Inspiration
- Colour
- Composition
- What message is the artist trying to put across?

A good written analysis should include correct art vocabulary and your own opinion of the work.

What needs to be included to create a good copy of Sandra Chevrier's work?
- Realistic detail
- Finer details
- Collage

A good artist copy should show a clear understanding of the artist's use of materials and techniques..

How do I develop my ideas to create a response to Sandra Chevrier's work? :
- Use the idea behind her work to inspire you.
- Use her composition style you like best,
- Make your work as detailed as possible.
- Use a collage material that links to your chosen celebrity.

A good artist response should link to the ideas and inspiration behind the artist's work and use her materials and techniques with skill and control.

Stretch and Challenge:
Have a go at drawing facial features using pencil crayons.

Expert modelling example..
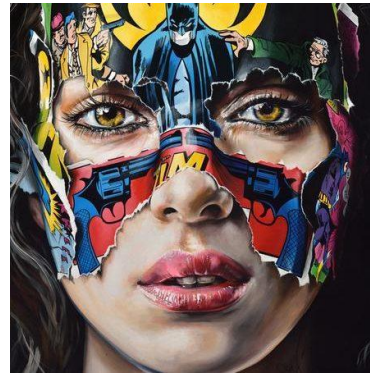
Artist copy/written analysis

Artist response

Wider Thinking:
Research the meaning behind 'The Caged' series by Sandra Chevrier to understand the greater meaning behind her work.

Keyword	Definition
Analyse	Examine in detail.
Tone	Tone in an artistic context refers to the light and dark values used to shade a realistic object.
Apply	Put skills/knowledge/understanding into action.
Describe	Give a clear description that includes all the main features – think of it as 'painting a picture with words'.
Finer Details	The details of something are its individual features or elements.
Composition	The arrangement of the subject matter, such as figures, trees, and so on in a work of art.
Investigate	Test the qualities of materials, techniques or processes through practical work.
Skilful	Apply materials, techniques and processes with a high level of understanding, ability and control.
Refine	Improve work taking into account feedback and aims.
Formal Elements	Key words that can be applied and used to describe 2D and 3D art and design.
Collage	A collage is a picture that has been made by sticking pieces of coloured paper and cloth onto paper.

30

**Developing ideas cultural research
Recording ideas.
Using resources – testing out ideas/media.
Making a personal response – final outcome.**

What makes a successful Day of the Dead artist research board?

- Cultural information/nationality/Inspiration.
- Exploration of links to natural forms.
- Colour testing
- Pattern testing
- Own response.

What message is behind Day of the Dead artwork?

A good written analysis should include correct art vocabulary and your own opinion of the work.

What needs to be included to record my own ideas?

- Realistic tonal drawings.
- Flowers.
- Insects.
- Pattern developments.

Good observational drawings should show a clear understanding of tonal shading/gradients/directional shading and detail.

How do I develop my ideas to create a response to Day of the Dead cultural art? :

- Use the ideas behind the work to inspire you.
- Combine symbols and patterns in a creative way.
- Use harmonious colour wash paint techniques successfully.

A good artist response should link to the ideas and inspiration behind the work and use similar materials and techniques with skill and control.

**Wider Thinking:
Look at Tim Burton's Corpse Bride or Disney's Pixar film 'Coco.'**

Expert modelling example..

Tonal drawings/Natural forms

Pattern/colour testing//Own response

Stretch and Challenge:
Use and combine materials and techniques with a high level of skill and control.

Keyword	Definition
Analyse	Examine in detail.
Simplification	Taking away complicated details.
Apply	Put skills/knowledge/understanding into action.
Describe	Give a clear description that includes all the main features – think of it as 'painting a picture with words'.
Watercolour wash	A watercolour wash is a layer of diluted paint. Washes are applied over a large area of a painting to help create backgrounds or build layers of colour.
Composition	The arrangement of the subject matter, such patterns and symbols on the areas of the skull.
Investigate	Test the qualities of materials, techniques or processes through practical work.
Skilful	Apply materials, techniques and processes with a high level of understanding, ability and control.
Refine	Improve work taking into account feedback and aims.
Formal Elements Colour, pattern, shape	Key words that can be applied and used to describe 2D and 3D art and design.
Harmonious colour:	Harmonious colours sit next to each other on the colour wheel and often link to nature.

31

ORMISTON SWB ACADEMY

Applique

Running Stitch

Back Stitch
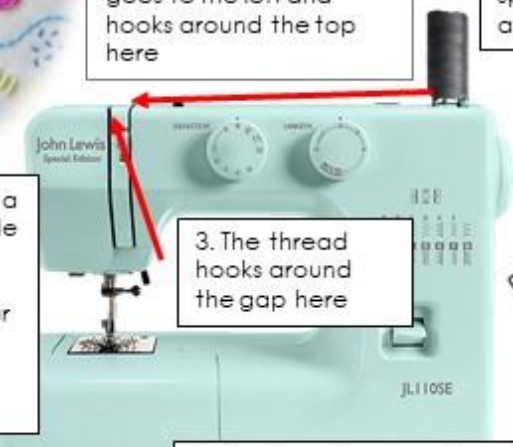
Cross Stitch

Blanket Stitch

2. The end of the thread goes to the left and hooks around the top here

1. Place the spool of thread at the top right

4. There is a lever inside the machine which your thread goes around

3. The thread hooks around the gap here

5. The thread moves down from the lever and gets threaded through the needle

John Lewis Special Edition

JL110SE

Holly Levell

Sweet Treats

Holly Levell

Colour Scheme

Observational Drawing

Applique Sample

Kit Kat

Tie - Dye Sample

Fabric Swatches

MINI CHE

Embroidery Sample

Photograph Of Final Cushion

Artist Response

Responding to the work of other **artists** is a great way to generate ideas. ... Starting with a direct **response** showing their understanding of the ideas and aesthetic of an **artist**, students can later leap off in creative ways.

Keyword	Definition
Analyse	**Analysis** is the process of breaking a topic or substance into smaller parts in order to gain a better understanding of it
Gradient	Gradation in **art** is a visual technique of gradually transitioning from one colour to another, or from one shade to another, or one texture to another.
Soft Sculpture	3D Art made from fabric.
Analogous	Colours that are next to each other on the colour wheel.
Influence	Something or someone that influences a person or thing, then, has an influence on that person or thing.
Moodboard	An arrangement of images, materials, pieces of text, etc. intended to evoke or project a particular style or concept.
Embroidery	**Embroidery** is the craft of decorating fabric or other materials using a needle to apply thread or yarn.
Applique	Layering pieces of fabric that are sewn or stuck on to a larger piece to form a picture/pattern.
Tie - Dye	A hand method of producing patterns in textiles by tying portions of the fabric or yarn so that they will not absorb the **dye**.

32

Year 8 – Computing – Flowcharts

ORMISTON SWB ACADEMY

Key Vocabulary	
Algorithms	A set of rules or instructions to be followed.
Flowcharts	A graphical way of showing an algorithm.
Selection	Deciding what code to run based on a decision or answer to a question. E.g an IF statement.
Sequence	A set of instructions that are completed in the exact order that they are written.
Iteration	Where a set of instructions is repeated. E.g a while loop, for loop and repeat until loop.
Input	Data that is given to the computer or program to then use.
Output	Information that is provided by the computer or program.
Procedure	A group of instructions grouped together that can be used by the main program.
Variable	A name given to a value in a program that can change when the program is running.

Careers
- Software development
- Programing
- Software Engineering

Flowchart Symbols

Symbol	Description
Start/Stop	Used at the start and end of a flowchart.
Input/Output	Controls all the inputs and outputs.
Process	General instructions and calculations carried out by the computer.
Decision	Where a question/decision is asked. Must have a 'Yes' and 'No' output.
→	Used to connect flowchart symbols to show the direction of flow in the program.

Variables
- **Variables are for storing values in memory.**
- **A variable is declared (set up) and values are assigned.**
- **Variables are assigned a value using the = operator.**
- **It chooses the bets data type for the value.**

- **No spaces in names but can use under_score or camelCase.**
- **No numbers at start of variable names.**

```
myvariable = 28

x = 3

name = "Bob"

my_wage = 3.5

favCol = "red"
```

Comments
- **Comments are for explaining lines of code or while sections.**

```
x = 3   #can comment at the side

#or comment above
house = "open"
```

Print
- **Print information to the screen.**
- **Can be text, numbers or values in variables.**

```
print("hello world")

print(12)

print(name)
```

Input
- **Allows user to type in data and store in a variable.**
- **User prompt requires the " ".**

- **May need to convert data types**

```
variable = input("message")

name = input("please enter your name")

age = int(input("please enter your age"))
```

Data Types
Real /Float
Number with decimal Point
Integer
Number without a decimal Point
String
A series of characters/TEXT
Character
A single letter or symbol
Date/Time
Date and Time in any format
Boolean
Yes no, true false value

Comparative Operators

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

If and elseif statement

- Allows SELECTION of different paths.
- Use of THEN & ENDIF.
- MUST include indent of 4 spaces or TAB
- ELSE is optional.

- Conditions are set using different comparison operators.

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

- Can use more than 1 condition using Boolean operators.

AND	Both conditions are True
OR	Either of the conditions is True
NOT	If condition not True

- Use of ELSEIF allows for further selection.
- Can have as many as wanted.
- ELSE still optional.

```python
if password ==  "pa55word1":
    print("you may enter")
```

```python
if score > 80:
    print ("grade A")
elif score > 70:
    print ("grade B")
elif score > 60:
    print ("grade C")
else:
    print ("redo")
```

```python
if password !=  "password1" or tries < 3:
    print("you shall not pass")
else:
    print ("please enter")
```

Careers

- Software development
- Programing
- Software Engineering

Sequence: Completing steps in the order which they must happen

Selection: Where a choice is made in a program depending on a condition or outcome

Iteration: Act of repeating or lopping specific sections of code

Count controlled Iteration: Repeats a set number of times

Condition controlled Iteration: Repeats until a condition is met or something in the program changes

35

While Loop
 	
Will keep asking the user to type in a value.
	``python
	#--while loop--
	password = input("enter password:")
	
	while password != "password1":
	    password = input("try again")
	``

While True (Break)
 	
If the user types in a value that matches 7 the loop will break (end), if not they will be told to try again.
	``python
	#--while True with break--
	while True:
	    guess = input("guess the number")
	    if guess == "7":
	        break
	    else:
	        print ("try again")
	``

For Loop
 	
Start at 0 and stop at 7 (up to 7 but not including), print hello each time (7 times).
	``python
	#--for loop--
	for i in range(0,7):
	    print ("hello world")
	``

For Loop (Break)
 	
Start at 0 and stop at 4,
If the user types in a value that matches mypassword the loop will break (end), if not they will be told to try again and have an attempt recorded.
	``python
	#--for with break--
	for i in range(0, 4):
	    if password == "password1":
	        break
	    else:
	        password = input("enter password")
	``

- Loops are a way for python to do blocks of code more than once

- Without having to keep copying the code

- Blocks of code being repeatedly run is called **iteration**

- Python offers two ways of looping
  - **while** loop
  - **for** loop

36

Empty list of 0 spaces.

Arrays with values. Use the , to split up space.

Can be different data types, strings need " ".

```
#--format--
mylist = [ ]

group = ["Tim", "Jane", "Bob"]

ages = [14,11,17,10.5,"Apple",True,False]
```

Procedure without parameters
- A procedure is defined at the top of the page.
- This procedure can then be called from the main program as many times as needed.
- The purpose of a procedure is to make code reusable.

```
#SUBROUTINES-----
def welcome():              #define
    print("hello world")


#MAIN------------
welcome()      #call
```

Print whole array.
Print 1st value in array.
Print 3rd value in array.
Prints from 1st value to 2nd value.

```
#--update value--
group[2] = "Mike"

group[0] = "Destiny "
```

Update a value to position 3 in array.

Update a value to position 0(start) in array.

```
#--print--
print(group)
print(group[0])
print(group[2])
print(group[0:2])
```

Procedure with parameters
- Arguments(values) can be passed to a procedure through the use of 1 or more parameters. The procedure can now use these values.
- In pseudo code you should state what data type these parameters are.
- When the procedure is called it is necessary to say what values or variables to pass to **the procedure.**

Add value to end of array.
Remove first instance of value from array.
Insert a value to a specific position in the array

```
#--adding/remove/insert--
group.append("Fred")

group.remove("Jane")

group.insert(2,"Miya")
```

```
#SUBROUTINES-----
def helloprocedure(amount, user):
    print((" hello " + user) * amount)
                #prints "hello Jim" 4 times
|

#MAIN-----------
amount = 4
user = "Jim"
helloprocedure(amount, user)
```

Check if a value is in array.

```
#--Length--
classsize = len(group)
```

Find length of an array (amount of values).

```
#--Check for value--
if "Tim" in group:
        print("hello tim")
```

37

Year 8 – Drama – Basic Drama Skills – Devising

What needs to be included in a good **freeze frame**? :
- Facial expressions
- Body Language
- Gestures
- Stillness
- Silence

A good Freeze frame should freeze at a key moment of the story.

What needs to be included in a good **thought track**? :
- Projection
- Vocal tone
- Focus

A good thought track should be detailed.
"I feel…………because……….."
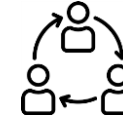
What needs to be included in a good **narration**? :
- Projection
- Vocal tone
- Focus
- Introduction of characters
- Introduction of setting

A good narration should be detailed and tell the audience what has happened prior to the scene.

Steps to a good performance.

Collaborate as a group and discuss initial ideas

↓

Create a **freeze frame** to show the audience your key idea.

↓

Add one **thought track** per character so the audience can learn more about your character.

↓

As a group, decide on a **narrator** and add a **narration** to the start of your scene to introduce characters and setting.

Keyword	Definition
Body Language	Using posture or movement to communicate how your character is feeling.
Collaboration	Working together as a group to create something new
Communication	Exchanging information through speaking, writing, or non-verbal communication.
Concentration	Focussing on the set task.
Facial Expressions	Showing your emotion through your face.
Focus	Not laughing while you are on stage and staying in character.
Freeze Frame	A frozen snapshot in time showing a key moment in a story.
Gestures	Using your hands to show the audience where to look through pointing, waving etc.
Narration	Telling the audience key moments of the story. Example: settings and characters.
Projection	Using a loud volume to make sure you are heard.
Thought Track	Stepping out of a freeze frame and telling the audience your character's inner thoughts.
Vocal Tone	Showing emotion through your voice.

a. Key Words

Treble clef-A symbol used to show higher pitched notes on the stave.

Stave-Five lines that music is written on.

Notation-Signs and symbols used to read music

Sharp-Makes note a semitone higher in pitch

Flat-Makes note a semitone lower in pitch

Scale-Going up in step following the key signature.
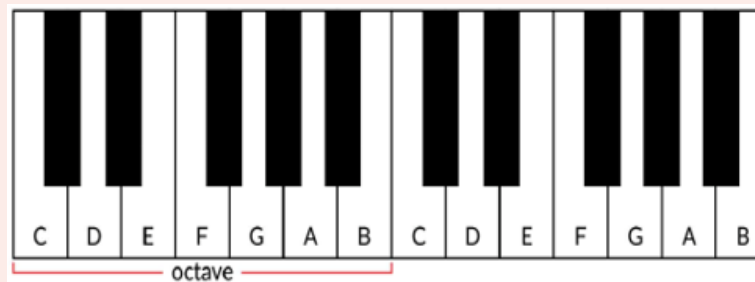
Chords-2 or more notes played together in harmony.
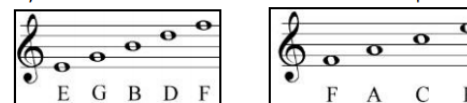
Octave-Interval of a note and the one 8 notes higher or lower

Pitch-How high or low a note is

Rhythm-A pattern of note lengths in time

b. Keyboard Notes and Notation

Every Green Bus Drives Fast.   Notes in the SPACES spell "FACE"

E G B D F   F A C E

Notes from **MIDDLE C** going up in pitch (all of the white notes) are called a **SCALE**.

C D E F G A B c' d' e' f'

c. Left Hand/ Right Hand Finger Positions
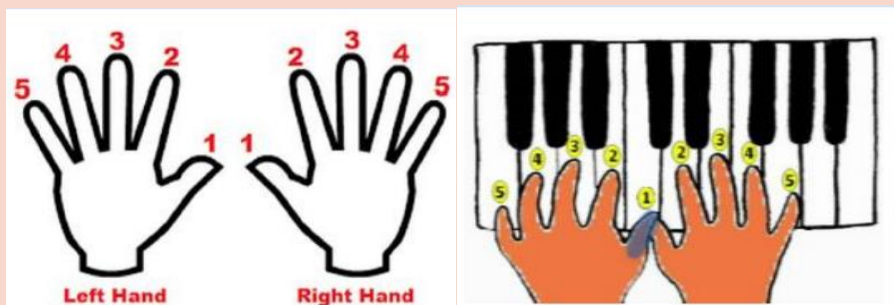
d. Keyboard Function
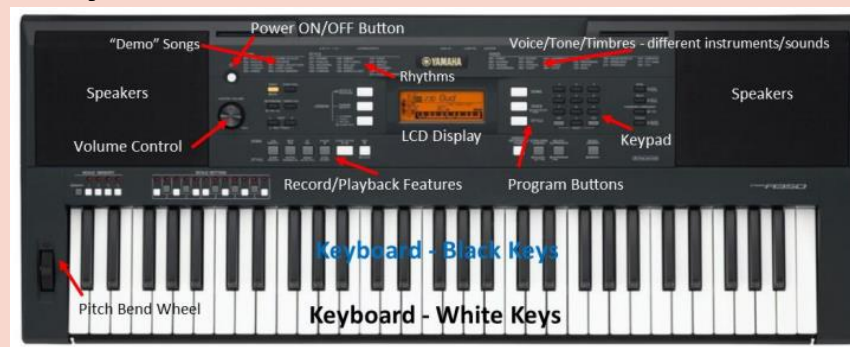
Year 8 What is Design Technology?

Design and technology gives young people the skills and abilities to engage positively with the designed and made world and to harness the benefits of technology.

Tools and Equipment

	Marking knife Used to mark out on woods		**Sand paper** Used to remove cut lines from wood
	Tenon Hacksaw Used to cut straight lines into wood		**Disk sander** Used to create a nice finish on wood
	Coping Saw Used to cut curved lines into wood		**File** Used to shape and flatten materials

Processes

Drilling	Sanding	Gluing and clamping	Marking out
A process of cutting away material to create a hole	Removing saw lines to improve the surface texture	Securely joining materials together using adhesives	Using different tools to mark out measurements onto materials

Health and safety

Machine guard	Floor marking	Safety signs	Table Vice
Protects from flying debris	Creates a safe zone around the machine	Warning and advisory signs	Hold your work steady

Materials

Pine wood	High impact polystyrene	Oak wood	Neoprene
A common wood used in construction	Cheap plastic used for most plastic products	An expensive wood used for furniture	A thermal plastic that helps insulate

Keywords	Tools and Machines	Materials
Analysing	Metal files	Acrylic
Investigating	Pillar drill	Aluminium
Collate	Wet & dry paper	Ferrous
Develop	Vacuum former	Non-ferrous
Improve	Wire wool	Metal
Manufacture	Laser Cutter	Alloy
Evaluate	2D Design	Polyvinyl chloride (PVC)
Explain	Bench Vice	High-density
Technical	Junior Hacksaw	polyethylene ABS
Dimension	Safety ruler	Copper
Tolerance	Pliers	Mild steel
Quality check	Engraver	Polypropylene

40

Year 8 What is Engineering?

Engineering is the application of science and math to solve problems. Engineers figure out how things work and find practical uses for scientific discoveries.

Health and safety

Goggle Protect your eyes	Apron Protect your clothing	Hair tie Protect your hair from entanglement	Vice Hold your work steady

Tools and Equipment

	Scribe Used to mark out on metals		Emery cloth Used to remove burrs and sharp edges
	Junior Hacksaw Used to cut into metals		Pillar Drill Used to cut circular holes into materials.
	Engraver Used to scratch designs into metal		File Used to shape and flatten materials

Materials

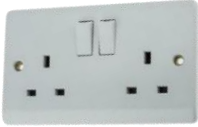| Mild steel A common material used in construction	Acrylic A recyclable type of plastic	Aluminium A light-weight metal used in drinks cans	Urea Formaldehyde A plastic used for tougher products

Processes

Sawing Using a sharp serrated edge to part materials	Filing Removing material to create a better surface finish or a different shape	Engraving To create a pattern or marking in a material, using small scratches	Brazing Using heat to permanently joining pieces of material together

Keywords	Tools and Machines	Materials
Analysing	Metal files	Acrylic
Investigating	Pillar drill	Aluminium
Collate	Wet & dry paper	Ferrous
Develop	Vacuum former	Non-ferrous
Improve	Wire wool	Metal
Manufacture	Laser Cutter	Alloy
Evaluate	2D Design	Polyvinyl chloride (PVC)
Explain	Bench Vice	High-density
Technical	Junior Hacksaw	polyethylene ABS
Dimension	Safety ruler	Copper
Tolerance	Pliers	Mild steel
Quality check	Engraver	Polypropylene

41

Why do we need to eat a **balanced diet**?

1. To achieve and maintain a healthy body weight.
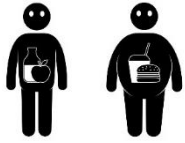
2. For growth and repair

3. To build a strong immune system, prevent disease and infection.
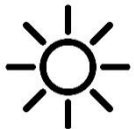
4. To provide energy.

5. To keep us warm.

How do we achieve a balanced diet? **Eight Healthy Tips:**

1. Base your meals on starchy foods.

2. Eat lots of fruit and vegetables.

3. Eat more fish – including a portion of oily fish each week.
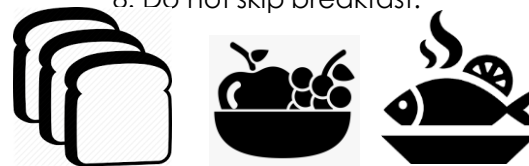
4. Cut down on saturated fat and sugar.

5. Eat less salt – no more than 4g a day for children.

6. Get active and try to be a healthy weight.

7. Drink plenty of water.

8. Do not skip breakfast.

Eatwell Guide: The Eatwell Guide outlines the recommendations for eating a healthy balanced diet. The guide shows the different types of foods and drinks you should consume – and in what proportions – every day or over a week. The Eatwell Guide shows how much of what you eat overall should come from each food group

Green Section:
Fruit and vegetables are a good source of vitamins, minerals and fibre, needed to build a strong immune system.

Yellow Section:
Starchy foods are a good source of energy. Choose wholegrains for increased fibre, needed to prevent constipation
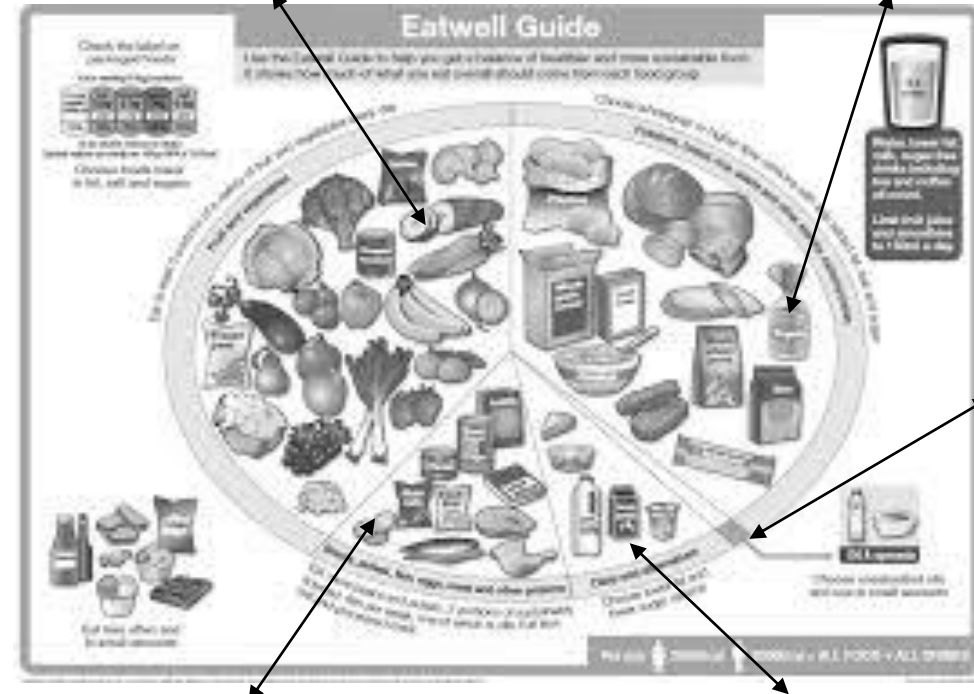
Purple Section:
Fats, oils and spreads should be eaten sparingly. These do provide energy.

Pink Section:
Beans, pulses, eggs, meat and fish are a good source of protein needed for growth, repair.

Blue Section:
Dairy foods provide a good source of calcium and vitamin D needed for strong bones and teeth.

Year 8 – Food Technology

There are **seven** major classes of nutrients: carbohydrates, fats, dietary fibre, minerals, proteins, vitamins, and water. These nutrient classes can be categorised a either **macronutrients** (needed in relatively large amounts) or **micronutrients** (needed in smaller quantities).

Macronutrients:

Carbohydrates provides the body with **energy**. There are two main types, complex and simple. **Complex carbohydrates** give **long lasting energy**. These are found in foods such as bread, pasta and cereals. **Simple carbohydrates** make blood sugar levels go up very quickly. This provides a **short burst** of **energy.** These are found in 'sugary; foods such as cakes, jams and sweets.

Protein is needed for **growth** and to **repair** cells. Protein is made up of amino acids. Proteins that are high in essential amino acids are called **high biological value (HBV)** proteins. These are found in milk, cheese, fish, eggs, meat and soya beans. Proteins that are low in amino acids are called **low biological value (LBV)** proteins. These are found in nuts, cereals and pulses.

Fats are used by the body for **energy.** Fat also forms an insulating layer under your skin to keep us **warm** and **protect our organs,** such as our kidneys. There are two main types of fat, **saturated** and **unsaturated.** Foods such as meat, cheese and butter are high in saturated fats. Foods such as seeds, fish and vegetable oils are high in unsaturated fats. We should eat less saturated fats.

Fibre helps food to move through our bowels and prevent **constipation**. Foods such as vegetables, wholemeal bread and beans are high in fibre.

Water is needed for lots of reasons, keeping our body at the right **temperature**, **digesting** food, **lubricating** our bones and keeping us **hydrated.** Water is found in drinks, fruits and vegetables.

Keywords	Definition
Constipation	Difficulty empting the bowels
Cholesterol	A type of fat found in our blood
Obesity	Overweight
Diabetes	A disease that occurs when your blood glucose (blood sugars), is too high.

Micronutrients:

Vitamin	What we need it for	Examples of where we get it from
A	Good vision and immune system	
B Group	Releasing energy from carbohydrates	Meat
C	Fighting diseases and helping the body to absorb iron	
D	Along with calcium, it helps our body make strong bones and teeth	Oily

Minerals	What we need it for	Examples of where we get it from
Iron	To make red blood cells to carry oxygen around the body	Green leafy veg
Calcium	Along with vitamin D, calcium helps make strong bones and teeth	

Consequences of a poor diet:
- Eating too many carbohydrates, fatty foods or sugary foods can lead to **obesity,** which can increase the risk of **type 2 diabetes** and **heart disease.**
- Eating too many salty foods can cause **high blood pressure.**
- Too much saturated fat can lead to **high cholesterol.**

A. Où habites-tu ? Where do you live?

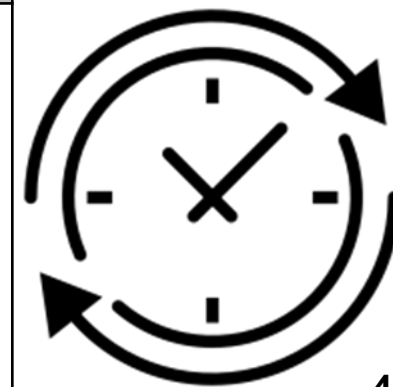|				
J'habite à I live in	**Bilston/Wolverhampton/Birmingham en Angleterre** in England			
	Paris	**la capitale** the capital		
	Lille	**dans le nord** in the north		
	Strasbourg	**dans l'est** in the east	**de la France** of France	
	Nice	**dans le sud** in the south		
	La Rochelle	**dans l'ouest** in the west		
J'habitais à I used to live in	**Bruxelles en Belgique** Brussels in Belgium			**depuis … ans** since … years
	Casablanca au Maroc Casablanca in Morocco			
	Dakar au Sénégal Dakar in Senegal			
J'aimerais habiter à I would like to live in	**Fort-de-France en Martinique** Fort-de-France in Martinique			**depuis … mois** since … months
	Libreville au Gabon Libreville in Gabon			
	Montréal au Canada Montreal in Canada			
	Nouméa en Nouvelle Calédonie Noumea in New Caledonia			
	Saint-Denis à la Réunion St Denis on Reunion Island			

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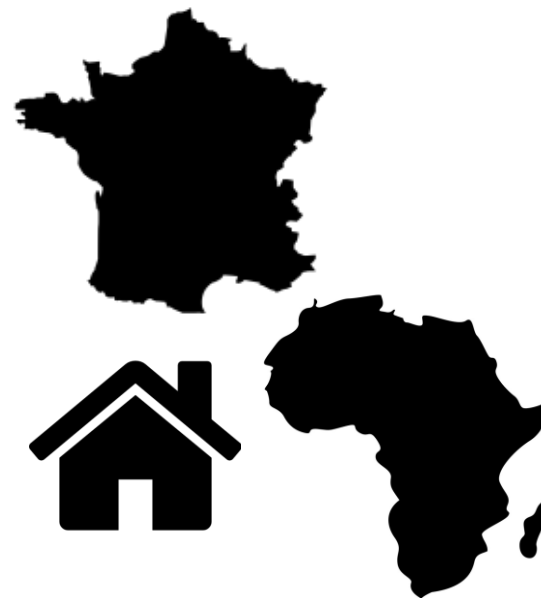
J'ai toujours voulu habiter I have always wanted to live
J'espère pouvoir habiter I hope to be able to live
Je rêve d'habiter I dream of living

B. C'est comment ta routine quotidienne ? What is your daily routine like?

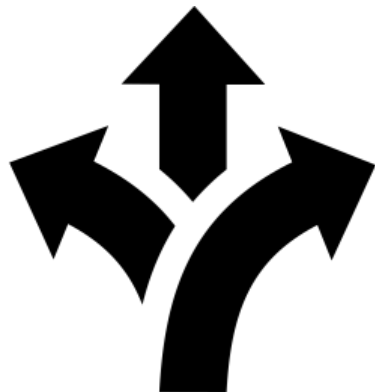|			
Avant l'école Before school	**je me brosse les dents** I brush my teeth	**à une heure** at 1 o'clock	
	je me couche I go to bed	**à deux heures** at 2 o'clock	
	je me détends I relax	**à trois heures** at 3 o'clock	
Après l'école After school	**je me douche** I have a shower	**à quatre heures** at 4 o'clock	
	je m'habille I get dressed	**à cinq heures** at 5 o'clock	
Le matin In the morning	**je me lève** I get up	**à six heures** at 6 o'clock	**et quart** quarter past
	je fais la grasse matinée (jusqu') I have a lie in (until)	**à sept heures** at 7 o'clock	**et demie** half past
L'après-midi In the afternoon		**à huit heures** at 8 o'clock	**moins le quart** quarter to
	je fais mes devoirs I do my homework	**à neuf heures** at 9 o'clock	
	je prends le petit-déjeuner I have breakfast	**à dix heures** at 10 o'clock	
Le soir In the evening	**je prends le diner** I have dinner	**à onze heures** at 11 o'clock	
	je rentre à la maison I go back home	**à midi** at midday	
		à minuit at midnight	

44

A. Qu'est-ce qu'il y a dans ta ville ? What is there in your town?

| Dans ma ville
In my town

Dans ma région
In my region

Dans mon village
In my village | il y a
there is/ there are

il n'y a pas de*
there isn't/ there aren't | **un aquarium** an aquarium
un bowling a bowling alley
un centre commercial a shopping centre
un centre sportif a leisure centre
un cinéma a cinema
un marché a market
un stade a stadium

une bibliothèque a library
une église a church
une gare a station
une mosquée a mosque
une piscine a swimming pool

des galeries galleries
des musées museums
des monuments monuments
des parcs parks
des restaurants restaurants | **où**
where | **on peut**
you can

on ne peut pas
you can't | **apprendre de l'histoire** learn about history
apprendre de la culture learn about culture

faire du shopping do shopping
faire du sport do sport
faire du tourisme do sightseeing
faire de la natation do swimming
faire de l'exercice do exercise

jouer au basket/foot/tennis play basketball/football/tennis

manger des repas chinois/indiens/italiens eat Chinese/Indian/Italian meals

regarder des concerts watch concerts
regarder des films watch films
regarder un match watch a match

sortir avec des amis go out with friends |

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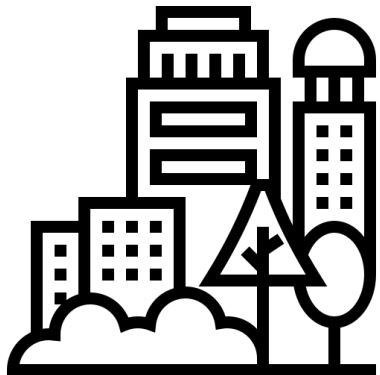
Dans le passé, il y avait In the past, there used to be
Avant on pouvait Before you were able to
Je voudrais qu'il y ait I would like there to be

B. Où est … ? Where is …?

| Pour aller
To go | **au bowling** to the bowling alley
au centre commercial to the shopping centre
au centre sportif to the leisure centre
au cinéma to the cinema
au marché to the market
au musée to the museum
au parc to the park
au restaurant to the restaurant
au stade to the stadium
à la bibliothèque to the library
à la galerie to the gallery
à la gare to the station
à la mosquée to the mosque
à la piscine to the swimming pool
à l'aquarium to the aquarium
à l'église to the church | **allez tout droit** go straight on

tournez à droite turn right
tournez à gauche turn left

prenez la première rue à droite take the first street on the right
prenez la deuxième rue à gauche take the second street on the left
prenez la troisième rue à droite take the third street on the right |

45

C. Qu'est-ce que tu vas faire dans ta ville ? What are you going to do in town?

| Ce soir
This evening

Demain
Tomorrow

Ce weekend
This weekend | je vais
I am going

nous allons
we are going | **apprendre de l'histoire** learn about history
apprendre de la culture learn about culture
faire du shopping do shopping
faire du sport do sport
faire du tourisme do sightseeing
faire de la natation do swimming
faire de l'exercice do exercise
jouer au foot/basket/tennis
play football/baskebtall/tenis
manger des repas chinois/indiens/italiens
eat Chinese/Indian/Italian meals
regarder des concerts watch concerts
regarder des films watch films
regarder un match watch a match
sortir avec des amis go out with friends | **à l'aquarium** at the aquarium
au bowling at the bowling alley
au centre commercial at the shopping centre
au centre sportif at the leisure centre
au cinéma at the cinema
au marché at the market
au stade at the stadium
à la bibliothèque at the library
à la piscine at the swimming pool

aux galeries at the galleries
aux musées at the museums
aux monuments at the monuments
aux parcs at the parks
aux restaurants at the restaurants |
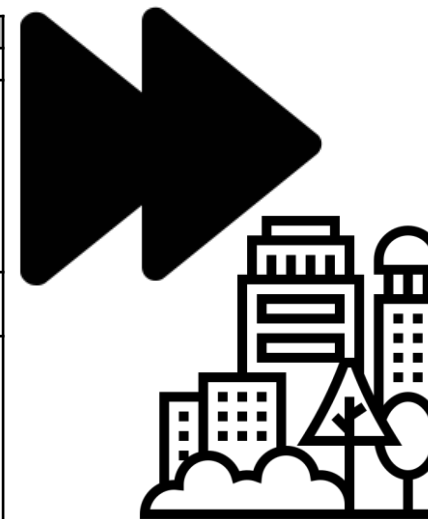
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en général – in general	franchement – frankly	quelle barbe ! – how rubbish!
à vrai dire – to be honest	il faut que je dise que – I have to say that	quelle horreur! – how awful!
évidemment – obviously	autant que je sache – as far as I know	

My extra vocabulary:

Year 8 – Geography – Topic 8 Our Urban World

World population

The population of the world has now increased to 8 billion.

The distribution of the global population is not equal. More people live in cities and countries such as China and India have significantly larger populations than others.

What is urbanisation?

Urbanisation is the process of people moving from a rural area into an urban area.

Due to urbanisation and growing urban areas, currently 56% of the world live in urban areas and this is expected to rise to 70% by 2050.

What causes urbanisation?

Push factors of rural-urban migration include war, famine, drought, low-paid jobs.

Pull factors of rural-urban migration include better healthcare, better education, better-paid jobs.

Urban areas are often more developed and have a higher quality of life as this is where governments focus their investments in a country.

Megacities

A megacity is a huge city – where the population is 10 million or above.

The map below shows where the 10 largest megacities are expected to be by 2025.

China is home to over 10 megacities, the largest has over 30 million people Chongqing.

Informal settlements

They are often built on the edge of cities. They are often found in developing and emerging countries.

The houses are built out of any available materials materials (e.g. metal and cardboard).

There are few services like electricity and clean water, this leads to high crime and disease rates.

There is often a strong sense of community between residents.

Informal settlements are home to 27% of the population in Rio de Janeiro.

Kiberia is the largest urban informal settlement in Africa, it is located in Kenya.

Push Factors	Pull Factors
• Poor living conditions • Conflict/War • Natural disasters • High levels of crime • Flooding • Lack of jobs • Lack of education • High levels of pollution • Lack of services (e.g. hospitals)	• Good healthcare • Good weather/climate • Lots of shops, cafes, services • Low levels of crime • Lots of jobs • Better education • Better quality of life/standard of living

Keyword	Definition
Economic	Something that relates to money.
Environmental	Something that relates to the land, sea or air.
Informal settlement	Settlements that cannot provide the basic living conditions necessary for its inhabitants to live in a safe and healthy environment.
Megacity	A city with a population of over 10 million.
Migration	The movement of people from one place to another.
Quality of life	The standard of health, comfort and happiness experienced.
Rural	Countryside.
Rural-Urban migration	People moving from the countryside to towns and cities.
Social	Something that relates to people directly.
Sustainability	Meeting the needs of people today without compromising those in the future.
Unequal	Not balanced, not the same.
Urban	Built up areas, e.g. cities, towns.
Urbanisation	The process of a higher proportion of people living in urban areas than in rural areas.

Sustainability

Sustainability means we can meet the needs of people today without compromising the needs of people in the future.

There are three ways a company, city or country can be sustainable:

1. Environmentally: This will focus on low carbon emissions, waste management and a high quality environment.

2. Socially: This will focus on communities, education and healthcare

3. Economically: This will focus on

Project and Presentation skills

Excellent team work.

Use of words, images and data.

Speaking clearly and confidently.

Good planning, organisation and time management.

Tokyo

There are nearly 14 million people in Tokyo, Japan.

Tokyo now have robots that can translate all languages for people who visit Tokyo to make them a more sustainable city.

Tokyo have to make sure they are prepared for earthquakes.

By 2050 Tokyo aim to have their carbon emissions at net zero.

Canberra

Canberra is the capital city of Australia.

Canberra offers 48 per cent of its energy in sustainable ways.

Much of this energy comes from renewable sources such as wind and solar power.

Renewable energy will not run out and does not cause a lot of pollution like fossil fuels do.

Canberra has an excellent city public transport service. The 'Transport for Canberra Policy' was released on 19 March 2012 and sets the scene and vision for a sustainable city.

As the city grows and changes transport aims to:

✓ Reduce traffic congestion

✓ Reduce greenhouse gas emissions

✓ Increase the number of people using public transport

✓ Improve accessibility for all Canberrans

✓ Improve links throughout the region
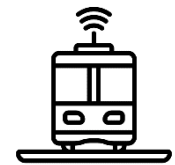
Jobs involved in a sustainable city

An architect is a skilled professional who plans and designs buildings.

A town planner helps communities companies and politicians to decide on the best way to use land and buildings.

An environmental manager or sustainability manager will ensure that an organisation is operating in accordance with environmental guidelines and targets.

A housing manager is responsible for a designated area. They will deal with tenants, local authorities, neighbours and organisations to create harmonious living.

Transportation planners are responsible for developing transportation strategies that include the needs of all transport users including pedestrians and cyclists. They will consider environmental efficiency and safety issues.

Cities of the future

By 2050, it is estimated that 70 per cent of the world's population will live in cities.

A greater emphasis needs to be put on quality of life and avoiding the negative effects of overcrowding in our world cities.

48

Year 8 – Geography – Topic 9 – Our Living World

Ecosystems around the world

Different ecosystems are found in different parts of the world. An ecosystem is when the environment and living organisms interact.

Tropical rainforests are located along the equator and deserts are located along the tropics.

Biomes are large ecosystems spread across the world.

Each biome has a different climate and varying biodiversity.

Food Chains and Food Webs

Food chains and food webs show the transfer of energy between different living organisms.

A food chain shows only one set of connections between organisms whereas a food web shows how these all interconnect.

Plants and trees are the producers – they create their own food through photosynthesis.

Consumers are unable to make their own food so they eat other organisms.

Primary consumers are herbivores that eat only plants for their food (e.g. rabbits, deer, insects).

Secondary consumers are carnivores that only eat primary consumers (e.g. spiders, foxes).

Tertiary consumers eat the secondary consumers (e.g. owls).
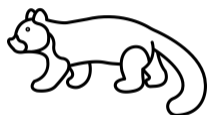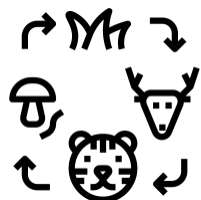
Keyword	Definition
Adaptation	The process where an organism changes to become better able to live in its habitat.
Biodiversity	The variety of plants and animals in an area.
Biome	A large naturally occurring community of flora and fauna occupying a major habitat, e.g. forest or tundra. The area of land.
Buttress Root	A plant adaptation of the tropical rainforest that helps keep tall trees stable.
Canopy	The second tallest layer of the tropical rainforest.
Consumers	An organism that feeds on plants or other animals for energy.
Climate	The average weather conditions of a place over an extended period of time.
Coral bleaching	When water is too warm, corals will expel the algae (zooxanthellae) living in their tissues causing the coral to turn completely white.
Coral Reef	An underwater ecosystem created by the exoskeletons of polyps.
Ecosystem	A community of living things and their environment. This is the interaction of living and non-living things.
Emergent Layer	The tallest layer of the tropical rainforest.
Endangered	A species that is at risk of extinction (dying out).
Food chains	A series of organisms each dependent on the next as a source of food.
Food Webs	An interconnected set of food chains showing how organisms rely on each other for food and energy.
Organism	Plants, animals.
Producers	An organism that creates its own food for energy (through photosynthesis).
Shrub Layer	The bottom layer of the tropical rainforest.
Under Canopy	Layer of the tropical rainforest found between the canopy and the shrub layer.

49

Year 8 – Geography – Topic 9 – Our Living World

The Tropical Rainforest
The rainforest climate is humid (hot and wet) which has created the four layers of the rainforest: Shrub layer, under canopy, canopy, and emergent layer.

Emergent Layer
- Tallest trees (between 40m and 50m tall).
- Not a good habitat for animals to live in.
- Gets most of the rain, wind and sunlight.

Canopy
- Trees are around 25-35m tall.
- Most of the trees are found in this layer and the tops create a thick canopy.
- Majority of animals species live in this layer.

Under Canopy
- Trees are around 20m tall.
- Large leaves to catch any sunlight that makes it through to this layer.

Shrub Layer
- Dark as canopy blocks out most sunlight.
- Small trees between 0 and 10m.
- Soil is poor quality so roots spread outwards to find nutrients.

Trees in the emergent layer have adapted by having buttress roots. These roots are large, wide and help to stabilise the tallest of trees. They spread wide to gather nutrients in the poor quality soil.

Sloths live in the rainforest. They have adapted by developing long claws to help them climb (giving them protection as the sloth can hide in the canopy layer), and by growing algae within the fur to act as camouflage from predators.

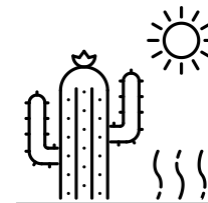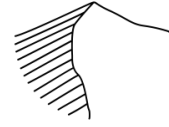Many tropical rainforests around the world are at threat due to deforestation.
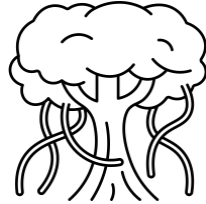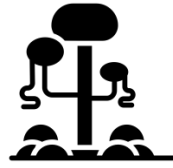
Deserts
To be classed as a desert, areas have to have less than 250mm of rainfall each year.

The Sahara desert is an example of a hot desert – it is found in northern Africa. As the Sahara is close to the Equator this means that the temperatures during the day are hot (around 40°C).

Antarctica is an example of a cold desert – it is found in the southern hemisphere. Antarctica is situated at the south pole and the sun is low in the sky which means that the temperatures are very cold (around -57°C).

In both hot and cold deserts, there is very little vegetation and few animal species can survive there. This is because of the extreme climate (either hot or cold temperatures and very little rainfall).

Food chains	A series of organisms each dependent on the next as a source of food.
Food Webs	An interconnected set of food chains showing how organisms rely on each other for food and energy.
Organism	Plants, animals.
Producers	An organism that creates its own food for energy (through photosynthesis).
Shrub Layer	The bottom layer of the tropical rainforest.
Under Canopy	Layer of the tropical rainforest found between the canopy and the shrub layer.

Coral Reefs
Coral reefs are made from limestone (calcium carbonate from the seawater).

Coral reefs need specific conditions to form. They can be found between 30°N and 30°S of the Equator, and cannot grow at depths of over 50m. The ideal temperature for coral reefs is 26°C – 27°C.

Coral bleaching is where the warming of the ocean causes the coral reef to lose its supply of nutrients, leading to the coral dying and becoming white.

Coral reefs protest coastlines from as storms and erosion, provide jobs for local communities and offer opportunities for recreation.

Coral reefs are also a source of new medicines. They are vital to the functioning of our oceans.

Key Words

Where was the empire?

- At its peak, the British Empire controlled nearly 25% of land on earth.
- Colonies were in North/South America, parts of Africa, India, South East Asia, and Oceania.
- Britain conquered many countries within Africa specifically and ruled over 30% of people living in the entire African continent. (Some were: Egypt, Sudan, Nigeria, Ghana, Uganda, South Africa, and many more).
- Many people from Africa were enslaved by Britain and other European empires.
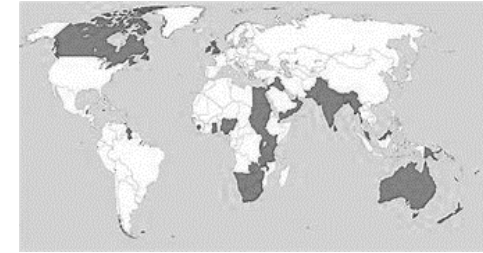
Why did Britain want an Empire?

- Britain wanted more wealth, power and resources.
- It looked to other countries to gain these items from by using its military or sometimes through trade.
- Britain could gain the most benefits by taking control of other countries and diverting each colony's wealth back into the empire.
- Britain also wanted to bring their idea of 'civilization' to what they saw as 'uncivilised' countries.

What was Africa like before the Empire?

- Before the slave trade and empire, Africa was rich in natural resources, head lots of wealth through trade, and was made up of many different vibrant communities and cultures across many different countries.
- The slave trade and colonisation devastated many of these countries with impacts that are still visible globally today.

Important figures

Olaudah Equiano   **Toussaint Louverture**   **Harriet Tubman**   **Queen Victoria**   **William**
Wilberforce

What was the Slave Trade?

- From the 1400s European traders forcefully took African people from their homes.
- At its peak, slaves were transported by ship from Africa to the Americas to be sold to plantation owners to produce resources like tea, coffee, sugar and tobacco.
- The journey to America (the Middle Passage) was horrific and could take several months. Many people died on this journey.

Conditions on a plantation

- A slave would be expected to work for most of their life. They only had short life expectancies. As young as 26.
- Some would work in the plantation owners house as a cook or maid. But most worked out on the fields.
- As young as nine they would farm on the fields.
- All slaves had to do hard work with a poor diet and harsh punishments.

Slave auction

- Slaves would be sold at an auction.
- People would go to the auctions and bid on the people they wanted to buy.
- Slaves were treated as property and not as people.

What was the resistance to the slave trade?

- Due to the conditions slaves experienced on-board slave ships and working on plantations, some slaves fought to resist and abolish slavery.
- This resistance could be through fighting for freedom with violence, refusal to work, escaping/running away, learning to read/write, pretending to be ill, breaking tools or poisoning their owner. Abolitionists tried to convince people that slavery was wrong by speaking about it in court and parliament.

The abolition of slavery

- The actions of the slaves eventually led to slavery being abolished in the British empire in 1833.

Slave	A person who is the legal property of someone else and forced to work for no pay. They are refused basic freedoms/ human rights.
Triangular Trade	The buying, selling and using of slaves between Europe, Africa and the Americas.
Colony	A country that has been taken over and is ruled by another country.
Empire	A group of countries all ruled over by one more powerful country.
Imperialism	The aim of increasing a country's power/ influence through military power and trade.
Plantation	A farm where slaves lived and worked for their masters. Plantations often grew tobacco, sugar, tea and cotton for the empire.
Resistance	To rebel against a higher power. E.g. fight against the higher power, refuse to work, or disrupt production/ trade.
Legacy	What is left behind after a thing or person no longer exists.
Abolition	Ending or stopping something. E.g. Abolish slavery = end slavery
Abolitionist	A person trying to end/ stop something.

51

Key Words

Archduke Franz Ferdinand		A prince and next in line to the throne of the Austro-Hungarian Empire.
Trench		A ditch dug into the ground about 7 feet deep and 4-6 feet wide. Used to defend soldiers from enemy fire.
Artillery		A big weapon that fired shells (bombs) from a far distance.
Recruitment		Getting people to join or sign up for something, in this case the army.
Alliances		Agreements made between countries to support and help each other if one is attacked in war.
Militarism		Increasing the amount of weapons and soldiers a country has to show its strength/power.
Nationalism		A belief of putting your country first above all others and taking great pride in your country, often thinking your country is the best.
Imperialism		The aim of increasing a country's power/ influence through military power and trade.
Propaganda		Information that is usually one sided used to promote a political cause or point of view.
Shell-shock		A medical illness suffered by soldiers who have often experienced horrific or traumatic events. Those with shell shock would sometimes suffer from panic attacks or uncontrollable shaking.
Conscientious Objector		A person who refused to fight in a war because of their religious, political or moral beliefs.
Trench foot		An injury common for soldiers in WWI, caused by continuously wet conditions that left feet rotting and becoming infected.

Who was important?

Archduke Franz Ferdinand   Kaiser Wilhelm II (ruler of Germany)   Lord Kitchener (in charge of recruitment)
Marie Curie (treated wounded soldiers in the trenches)   Walter Tull (first black officer)
Harry Farr (suffered from shell shock but was mistaken as a coward and shot)   General Douglas Haig (British General)

Key causes of WWI

Long Term:
- Imperialism – Countries of Europe were competing against each other to gain more land and power around the world = increased tension.
- Nationalism – Strong beliefs in these countries led people to believe that their country was more powerful and more deserving of certain things, like land/power/resources. = rivalry between nations.
- Militarism – countries wanted to have the biggest and strongest army. = 'arms race' to develop the best army which leads to more rivalry and jealousy between countries, e.g. Germany V Britain.
- Alliances – These 'friendships' meant that some countries felt threatened by being on their own, it also meant that if two countries went to war, their allies would also be dragged into the war.

Short Term:
- Assassination of Archduke Franz Ferdinand – Murdered by a group of Serbians who wanted Bosnia to be joined with Serbia and free from the control of the powerful Austro-Hungarian Empire.
- Franz Ferdinand was killed as a show of defiance against the power hungry empire.
- The Austro-Hungarians blamed Serbia for the attack, rather than just the small group, and declared war. Serbia was allies with Russia, who came to Serbia's defence. Germany (allies with Austria-Hungary) declare war on Russia to defend Austria-Hungary. France is also allies with Russia, so Germany attack them first to try and avoid a war on two fronts. By doing this, Britain must now join the war to defend its allies (France and Belgium) from Germany. = Total war in Europe.

Recruitment

- Britain recruited an army of 1 million men within 6 months of the war beginning. These men were all volunteers who wanted to 'do their bit' for their country. However, it soon became clear that this wasn't going to be enough men!
- The armies of Europe were huge and Britain's army was far outnumbered compared to Germany, France and Russia.
- Propaganda was used to encourage men of Britain to join the army. This was mostly in the form of posters that put across the most convincing and key messages for men to join up.
- Some posters made men feel guilty for not fighting, or they made war seem like a fun adventure, or some targeted the mothers and wives of Britain to encourage their men to join the army.
- The propaganda campaign from the government was a success with 2.5 million men joining the army by 1916.
- See an example on the next page.
- Millions of men were also recruited by countries of the British Empire, such as; The West Indies, South Africa, India, Canada, Australia and New Zealand. They were often not treated as well as they deserved but Britain would never have survived as long as it did without the help of these brave soldiers from across the empire.

An example f one propaganda poster used by Britain. It says, 'Your country needs YOU'

Trenches

- Trenches were hard to attack and easy to defend. Soldiers started digging them to defend themselves.
- Soon the two sides were stuck in a 'face off' determined to hold onto the land they had captured.
- They were a network of ditches that extended from the mountains in France all the way to the ocean in Belgium.
- Some times one side would try to capture the enemy's trench to gain ground. The foot soldiers had to climb out the trench and advance across 'no-man's land facing machine gun fire, artillery bombs and barbed wire.
- Thousands of men died each day trying to gain small amounts of land.

Conditions

- Life for soldiers was horrible – wet, muddy and freezing in winter; dry and boiling hot in the summer with small amounts of water available.
- Disease and illness was common. E.g. trench foot, lice, pneumonia.
- Some modern treatments for illnesses were developed due to the war, e.g. X-Rays, blood transfusions and triage (which managed how the wounded were treated).
- Food was basic, often plain stew with stale bread and hard biscuits. Rats often got into the food supplies and even bit the men.
- Soldiers had to keep busy by fixing parts of the trenches, keeping watch for attacks and bringing supplies to the front line.

General Haig: Was he to blame?

Responsible for the many deaths at the Battle of the Somme

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- Thousands of British soldiers died under his command (20,000 on day one of the Battle of the Somme).
- Haig never went to the frontline so did not understand the horrors the ordinary soldiers faced.
- He continuously tried the same battle plans that had failed many times before.
- Haig still believed that cavalry (horsemen) would be important soldiers in WWI – against Germans armed with machine guns.

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- Haig understood that to win the war, many sacrifices had to be made including loss of life.
- His tactics were very common for the time and other countries suffered bigger losses.
- Soldiers had to 'go over the top' of the trenches to end the war.
- Haig did try new tactics, such as the 'creeping barrage' which helped Britain win the war.
- He pushed for Britain to use tanks at the battle of the Somme which did help bring victory once their first problems were fixed.
- Haig and his army did play a major role in defeating Germany and their allies.

Weapons

- The most common injury was caused by artillery bombs – either from the explosion or from shrapnel (small shards of metal) that flew off the shell once it exploded.
- Most soldiers fought with a rifle that fired a single shot, with a bolt that was pulled to load the next bullet in the magazine. They were relatively slow but trained soldiers could fire 20 bullets per minute.
- German trenches were heavily defended by many machine guns which could fire 300 bullets per minute.
- Gas attacks were used with mixed results. The first attack caused a mass panic amongst the French soldiers, but the gas was hard to control due to changing wind direction and later in the war most soldiers had gas masks to survive the attacks.
- Tanks were used for the first time in war in 1916. They were very slow, easily broke down and did not have big heavy guns like today's. They were bulletproof, could travel over the rough ground of the trenches, and take out barbed wire for the foot soldiers to follow behind.
- Planes – mostly used to spy on the enemy trench and to see where artillery attacks might come from. They later carried basic weapons like bricks and pistols. Eventually, machine guns were mounted on the front to shoot down enemy planes.
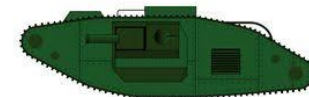
A WWI tank invented by the British.

53

Key Words:

Commitment: Dedicating yourself to something

Sacrifice: Give something up for the sake of others/faith

Charity: Giving help or money to those in need

Hijab: A head covering worn by some Muslim women

Niqab: A veil or face covering worn by some Muslim women

Halal: An action which is allowed in Islam. Often used to describe food and the way meat is slaughtered

Haram: Acts that are forbidden in Islam

Ramadan: An Islamic period of fasting (giving up food & drink in the hours of sunlight)

Zakat: An Islamic duty to give 2.5% of their earnings to charity

Amrit Ceremony: Ceremony within Sikhism to commit fully to the faith

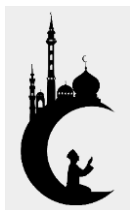**Kesh:** Uncut hair. The act of allowing hair to grow naturally out of respect for God's creation (Sikh practice)

Kachera: Cotton underwear worn by baptised Sikhs

Kirpan: A sword or knife carried by baptised Sikhs

Kara: A steel or cast iron bangle worn by baptised Sikhs

Kanga: A small wooden comb that baptised Sikhs usually use twice a day. It is supposed to be kept with the hair at all times

Sewa: Selfless service

Islam

Commitments	**5 Pillars** - The Five Pillars of Islam are the five duties that every Muslim must satisfy in order to live a good and responsible life according to Islam - **Shahadah**: sincerely reciting the Muslim profession of faith - **Salat:** performing ritual prayers in the proper way five times each day - **Zakat:** paying a tax to benefit the poor and the needy - **Sawm**: fasting during the month of Ramadan - **Hajj:** pilgrimage (religious journey) to Mecca
Religious Dress	- Both men and women are required to dress modestly (respectfully) - Muslim women have special clothes which they sometimes **CHOOSE TO WEAR** in order to protect their modesty.
Ramadan	- Most Muslims fast between dawn and sunset during the month of **Ramadan**. - Fasting allows Muslims to devote themselves to their faith. It is thought to teach self-discipline and reminds them of the suffering of the poor. - However, children, pregnant women, elderly people and those who are ill or travelling don't have to fast.
Zakat	- It is a Muslims duty to give 2.5% of their earnings to charity (**Zakat**) - This is compulsory, and must be given after a Muslim's family has been taken care of. - The rich pay more than those with less money and very poor people pay nothing at all. - Muslims give to charity because they see wealth as a loan from **Allah** (God). - These donations help Muslims to purify their souls by not being greedy. - The Qur'an states *'practise regular charity.'*

Sikhism

Commitments	**Amrit Ceremony**: - This is where Sikhs are officially welcomed into the religion of Sikhism. - It is a form of baptism and Sikhs become baptised Sikhs. - Sikhs can go through this ceremony when they are old enough to understand the commitments they are making. - Sikhs will make a set of promises to Waheguru (God) including to avoid **eating meat and drinking alcohol, and to wear the 5Ks**. - Once they have gone through the ceremony, they are a member of **the Khalsa**. This is the group of committed Sikhs who vow to stand up against injustice and follow the Rehat Maryada, the Sikh code of conduct. - Once they have joined the Khalsa, a Sikh is known as an **amritdhari** Sikh.
Religious Dress	**5Ks** - Sikhs who are baptised should wear the 5 Ks. These are items which symbolise their dedication to Waheguru (God) - **Kesh**: Sikhs must not cut their hair, for example Sikh men are forbidden to trim their beards. - **Kara**: A steel bangle. A symbol of Waheguru having no beginning or no end. - **Kanga:** Wooden comb. This symbolises a clean mind and body, since it keeps the uncut hair neat and tidy. It symbolises the importance of looking after the body which God has created. - **Kachera**: Cotton underwear. It's a symbol of chastity. Chasity means that a person should be pure, faithful and refrain from sexual intercourse. - **Kirpan**: A small, ceremonial sword. The Kirpan is supposed to be a weapon of defence only and many Sikhs carry around a symbol as opposed to an actual sword.
Sewa: Selfless Service	- One key duty for Sikhs is to perform **sewa**, meaning selfless service. - Sikhs have a duty to do selfless things for others, without expecting anything in return. - There are different types of sewa: - **Tan (physical sewa)** for example serving in the langar, the Sikh free kitchen. - **Man (mental sewa):** using your mind to help others e.g. reading the Guru Granth Sahib or teaching others - **Dhan (material sewa):** giving something up, for example money. Sikhs are expected to give 10% of their income to charity. This is a form of dhan, known as **dasvandh.**

54