Y9 Search for the Truth KO

WORD	DEFINITION
Riot	Riot public disorder caused by a crowd or group of people protesting against another group.
Bias	A particular trend, tendency, inclination, feeling or opinion. Especially one that is preconceived or unreasoned.
manipulative	Influencing or attempting to influence the behaviour or emotions of others.
impeach	To accuse a public official of misconduct in office.
transcript	A written, typed or printed copy. Usually from speech.
disaster	A calamitous event, especially one occurring suddenly.
rifle	To ransack, search or rob.
harrowing	Extremely disturbing or distressing.
defame	To attack the good name or reputation by slander or libel.
plausible	Having an appearance of truth or reason; seemingly worthy of approval or acceptance.
justice	The quality of being 'just'; righteousness or morally right.
perspective	The state of ones ideas, the facts known to one.

CONTEXT	SUMMARY OF EVENTS
Week 1 – Stonewall	The Stonewall riots, also known as the Stonewall uprising, Stonewall rebellion, or simply Stonewall, were a series of spontaneous protests by members of the gay community in response to a police raid that began in the early morning hours of June 28, 1969, at the Stonewall Inn in New York City.
Week 2 - Grenfell	The fire which destroyed Grenfell Tower in June 2017 was one of the UK's worst modern disasters. Just before 01:00 on 14 June, fire broke out in the kitchen of a fourth floor flat at the 23 storey tower block in North Kensington, West London. Within minutes, the fire had raced up the exterior of the building and then spread to all four sides. By 03:00, most of the upper floors were well alight. Seventy-two people died.
Week 3 – Hillsborough	Hillsborough disaster, incident in which a crush of football fans ultimately resulted in 97 deaths and hundreds of injuries. The crushing occurred during a match at Hillsborough Stadium in Sheffield, England, on April 15, 1989. The tragedy was largely attributed to mistakes made by the police.
Week 4 – Central Park 5	The Central Park jogger case (sometimes termed the Central Park Five case) was a criminal case concerning the assault and rape of Trisha Meili, a white woman in Central Park in Manhattan, New York, on April 19, 1989.

PAF	
Purpose	Why are you writing? e.g. *To entertain, to inform, persuade…*
Audience	Who are you writing for? e.g. *Young adults, children, teachers…*
Form	What type of text are you going to write? e.g. *A recipe, an article, a story…*

Writing	
A – alliteration. The repetition of key sounds or letters.	E – emotive language. Use pathos to really create tone and reader reaction.
F – fact. Support the statement or opinion using key irrefutable facts.	S – statistics. Use key statistics that are believable in context to support your ideas.
O – opinion. State your opinion and make it clear throughout.	T- triple. Create a building verb or building adjective list to create emotion.
R – rhetorical question. Invite the reader to question their own ideas/morals.	*Remember, there are more features you can embed but these are the minimum we expect.*

PUNCTUATION	
,	Clauses and lists
;	Lists and two equal weight clauses
!	Use sparingly
…	Use sparingly

Y9 SAY IT OUT LOUD KO

VOCABULARY

Speaking	The action of conveying information or expressing one's feelings in speech. The activity of delivering speeches.
Spontaneous	Acting upon sudden impulse and without premeditation.
Phonology	The study of speech sounds or patterns in language.
Interrupt	To stop (a person) in the midst of doing or saying something.
Tribulation	Severe trial or suffering

HOW TO PRESENT YOUR SPEECH

- Communicate clearly, effectively and imaginatively, selecting and adapting tone, style and register for different forms, purposes and audiences.
- Clear address to audience
- Rhetorical indicators that an audience is being addressed throughout.
- Use a range of vocabulary and sentence structures for clarity, purpose and effect.
- A clear sign off, e.g. 'Thank you for listening'
- Be ready to answer question on your chosen subject, answer clearly and precisely.

USEFUL SENTENCE STARTERS - BEGINNING

•Two or three adjectives in a row
•Britons today tend to believe... / Common sense seems to say that...
•It is often said that... / Many people assume that...
•According to [credible source] ... / Evidence suggests that ...
•Starting with Despite / Starting with statistics
•Starting with rhetorical questions / Undeniable evidence suggests …
•A disgusting/disgraceful/wonderful ___%
•Minister of Education/Health/Environment/Transport/Culture
•Is _____ really something we can allow to develop? Undoubtedly, it is not!
•Young people/pets/elderly people/Britons deserve…
•Ladies and gentlemen, how can we possibly disregard this important issue?

SPEECH CHECK LIST

• formal language
• close relationship with audience providing reasons for a course of action
• empathy with the audience's problem
• several suggestions about what to do
• use of modal verbs (e.g. might, could should) • build the confidence of the reader
• address the reader directly in the second person (you)
• use imperatives (e.g. 'you should', 'make sure that you', 'be careful to')
• raise questions and give answers
• lead to a clear conclusion about action to be taken

AFORESTRIP

A - Alliteration
F - Fact
O - Opinion
R - Rhetorical Question
E - Emotive Language and Exaggeration
S - Statistics
T - Triplets
R - Repetition
I - Imperatives
P - Personal Pronouns

Types of Sentence

Fragment	An incomplete sentence (no subject verb agreement). "Nothing." "Silence everywhere."
Simple	A sentence with one independent clause. "She went to the shop."
Compound	A sentence with multiple independent clauses. "She went to the shop and bought a banana"
Complex	A sentence with one independent clause and at least one dependent clause. "Sometimes, when she goes to the shop, she likes to buy a banana."

WHAT IS YOUR AIM?

To persuade your audience to do something, eg to stop dropping litter? To convince your listeners that your point of view is a fair one to hold? To entertain your audience? To share important information? To give instructions, a report, advice or explanation? Prepare your notes accordingly.

WHAT IS YOUR AIM

- Who are your audience?
- Why are you speaking to them?
- How old are they?
- What matters to them?
- What do you want them to do or feel?
- Why should they listen to you?

TYPES OF SENTENCE

Declarative	Makes a statement.
Imperative	Gives a command or a request.
Exclamatory	Expresses strong emotion; exclamation marks.
Interrogative	Direct question; question mark.

PARAGRAPH	CONTENT
1	**Opening Paragraph** - A good opening also needs to engage your audience. It is the first thing they will hear (before they start to get distracted) so you need to get them interested. Don't lose them at the start! One way to do this is to use an **anecdote**.
2	**Body of the Argument –** Your main reason/justification of your argument. **Include:** Clear position on the statement Start with a shocking statistic Uses repetition Explains how the statement is incorrect using a range of fact A short sentence for impact
3	**Counter Argument -** Counter-arguments should outline an idea or argument that is the opposite to your own ideas. They should begin with a connective. **Include:** Clear position on the statement Opens with a connective: Uses statistics: Explains how the statement is incorrect using a range of facts Ends with a rhetorical question: *Why must this punishment…?*
4	Write the wider issues of a speech in which you give your viewpoint on this statement. **Include:** Clear position on the statement.
5	Sum up your argument/ encourage the audience to do something about your cause.

USEFUL SENTENCE STARTERS – MIDDLE/END

•Considering X, it is not surprising Y / I passionately believe …
•When one thinks of X, one imagines Y / I am a…
•This is my reality. As a… / Speaking as a… / In my role as a… / Being a… I see…
•After years of experience as a… / My sons, aged _ and _,…
•One of my students/patients/clients…
•If you could spend a day in my shoes as a… you would soon find out…
•If you were a fly-on-the-wall of my classroom/office/home…
•Although it is true that Y, also X….
•Proponents of X are right to argue that _____. But they are exaggerating when they claim that _____
•Unequivocally, I would argue… / I propose that… / My solution is...
•To end X, we need to do Y / For _____, for _____, for _____: we need ____.
•More deeply, however, I would argue that /
•The more, the more, the more sentence
•Cannot, Cannot, Cannot (Can) / Without a doubt, … / After all, …

Pythagoras and trigonometry Student Knowledge Organiser

Key

Formula

$$a^2 + b^2 = c^2$$

a = side of right triangle
b = side of right triangle
c = hypotenuse

The **hypotenuse** (h) is the longest side. It is opposite the right angle.

The **opposite side** (o) is opposite the angle in question (x).

The **adjacent side** (a) is next to the angle in question (x).

Trigonometric Formula

What are the formulas for sin cos and tan?

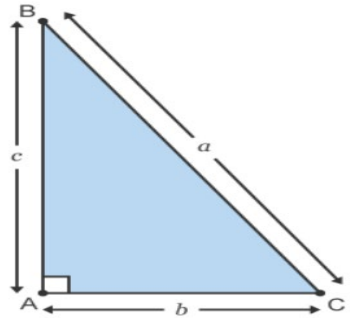
- $\sin x = \frac{opposite}{hypotenuse}$
- $\cos x = \frac{adjacent}{hypotenuse}$
- $\tan x = \frac{opposite}{adjacent}$

North East Learning Trust

Pythagoras

Right-angled triangles

Pythagoras' theorem states that for all right-angled triangles, **'The square on the hypotenuse is equal to the sum of the squares on the other two sides'**. The hypotenuse is the longest side and it's always opposite the right angle.

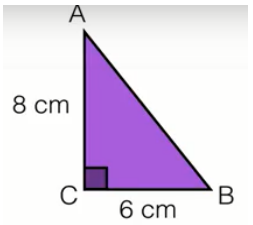


In this triangle $a^2 = b^2 + c^2$ and angle A is a right angle.

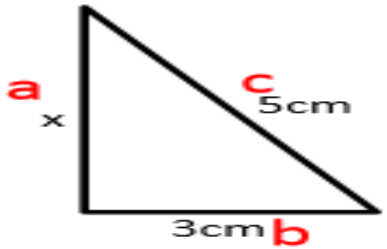
Pythagoras' theorem only works for right-angled triangles, so you can use it to test whether a triangle has a right angle or not.

In the triangle above, if $a^2 < b^2 + c^2$ the angle A is acute.

In the triangle above, if $a^2 > b^2 + c^2$ the angle A is obtuse.

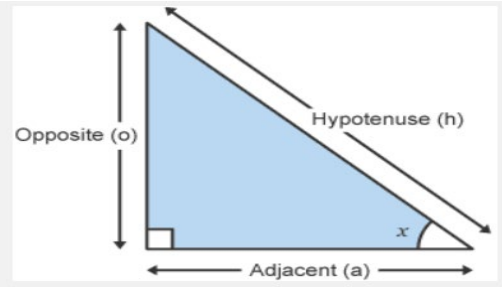


$AB^2 = BC^2 + AC^2$
$AB^2 = 6^2 + 8^2$
$AB^2 = 36 + 64$
$AB^2 = 100$
$AB = \sqrt{100}$
$AB = 10$ cm



$a^2 + b^2 = c^2$
$x^2 + 3^2 = 5^2$
$x^2 + 9 = 25$
$x^2 = 25 - 9$
$x^2 = 16$
$x = \sqrt{16}$
$x = 4$ cm

Trigonometry

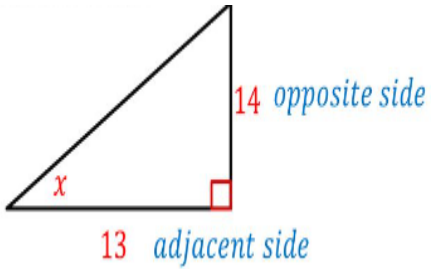


$\sin\theta = \frac{opp}{hyp}$

$\sin(64) = \frac{17.3}{y}$

$y = \frac{17.3}{\sin(64)}$

$y = 19.24801...$



Use tangent ratio $\tan x = \frac{O}{A}$

Use inverse tangent $x = \tan^{-1}\left(\frac{14}{13}\right)$

Solve for x using calculator $x = 47.1°$

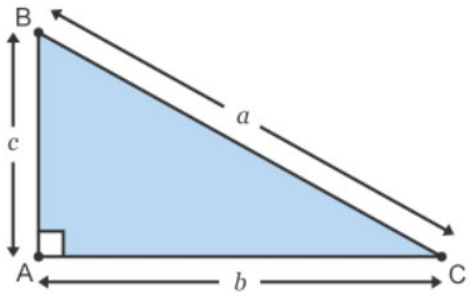
Hegarty Maths Links

Pythagoras: Videos 497-507

Right Angled Trigonometry: Videos 508-515

Pythagoras and trigonometry Student Knowledge Organiser

Pythagoras

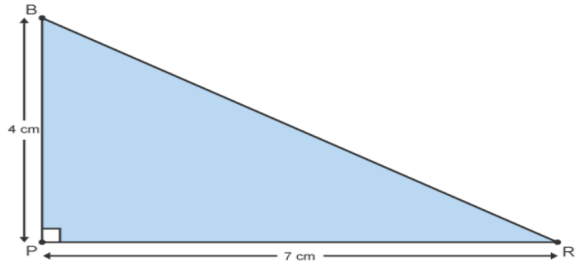


$$a^2 = b^2 + c^2$$

$$b^2 = a^2 - c^2$$

$$c^2 = a^2 - b^2$$

Work out the length of the line BR, correct to 1 decimal place.



A fireman has a ladder that is 13 metres long. If he wants to reach a window that is 12 metres above the ground, how far from the wall should he put the bottom of his ladder?

Peter's house is exactly 481m from school. To get home he walks 480m south and then he walks west. How far west does he have to walk?

A triangle has sides of length 23.8cm, 31.2cm and 39.6cm.

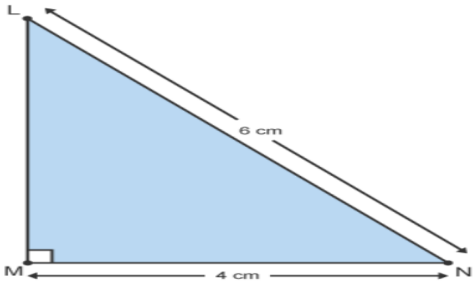
Is this a right-angled triangle?

Show how you decide.

North East Learning Trust

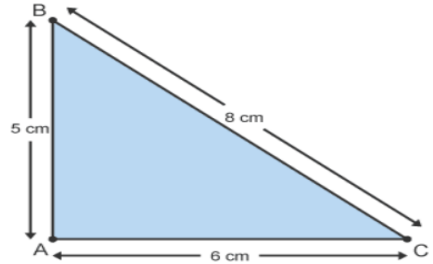
Pythagoras

Work out the length of the line LM, correct to 1 decimal place.



Which of the following triangles is right-angled?

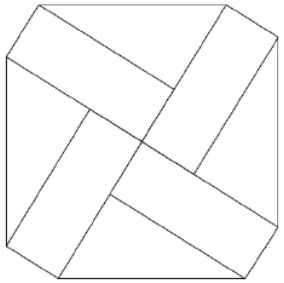
a)



b)

Here is a rectangle.

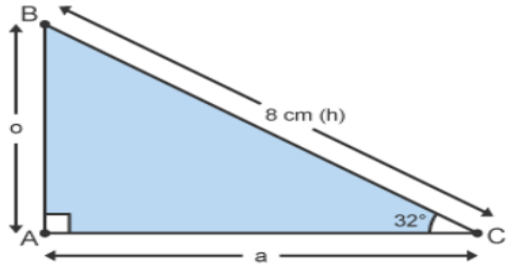
The 8-sided shape below is made from 4 of these rectangles and 4 congruent right-angled triangles.



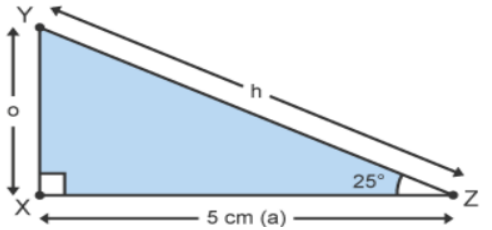
Work out the perimeter of the 8-sided shape.

Trigonometry

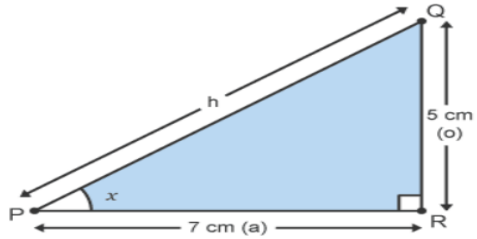
Calculate the length AB. Give the answer to one decimal place.

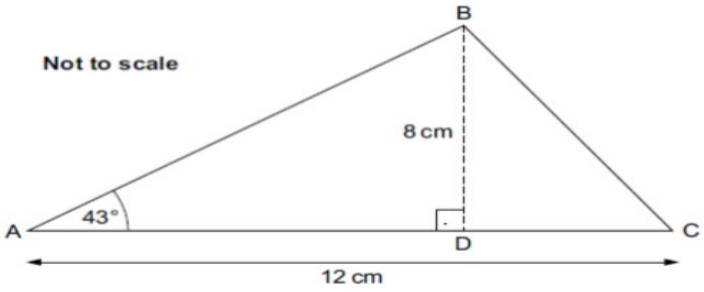


Calculate the length YZ. Give the answer to one decimal place.



Calculate the angle QPR. Give the answer to one decimal place.





Calculate angle BCA.

Pythagoras Student Knowledge Organiser

Key words and definitions

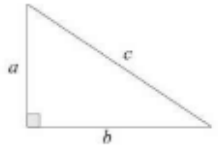
Pythagoras: A Greek mathematician born in 570 BC
Right angled Triangle: A Triangle with one angle exactly 90 degrees.
Hypotenuse: The longest side of a right-angled triangle that has position always opposite the right angle
Isosceles Triangle: a triangle with two equal sides and two equal angles. There is a unique Isosceles triangle that is also right angled. Angles would be 45- 90- 45
Pythagorean Triple : are three integers that form the sides of a right- angled triangle for example 3-4-5.

Pythagoras Theorem

Pythagoras Theorem links all three sides of a right angled Triangle together. Commonly we get two sides and need to find the third side

Pythagoras' Theorem

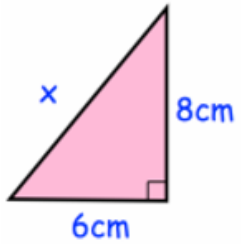
For any **right angled triangle**:



$$a^2 + b^2 = c^2$$

Used to find **missing lengths**.
a and b are the shorter sides, c is the **hypotenuse (longest side)**.

Finding the Longest Side (Hypotenuse)



Replace the values into the formula $a^2 + b^2 = c^2$

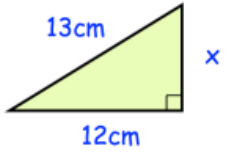
using $a = 6cm$ *and* $b = 8cm$ *to give* $6^2 + 8^2 = c^2$

$$36 + 64 = c^2$$

$$100 = c^2$$

This would give the missing side as $10cm$

Finding a shorter side (not the hypotenuse)



Replace the values into the formula $a^2 + b^2 = c^2$

using $c = 13cm$ *and* $a = 12cm$ *to give* $12^2 + b^2 = 13^2$

$$144 + b^2 = 169$$

$$b^2 = 169 - 144$$

$$b^2 = 25$$

$$b = 5\,cm$$

This would give the missing side as $5\,cm$

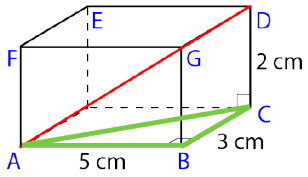
Checking if a Triangle is Right Angled

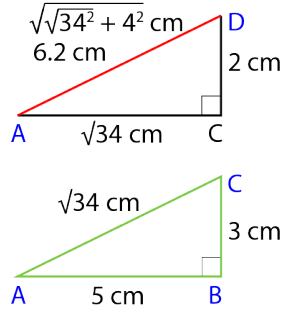
With an inaccurate diagram or just three lengths.
Carry out Pythagoras and see if the sum of the squares of the two shorter lengths are equal to the square of the longer side.

If Pythagoras Theorem holds true, these three sides form a right-angled triangle

Pythagoras In 3D

Commonly used as repeated Pythagoras. Using Pythagoras once to find the missing Length AC then again to find AD





Hegarty Maths Links

Pythagoras: Videos 497-507

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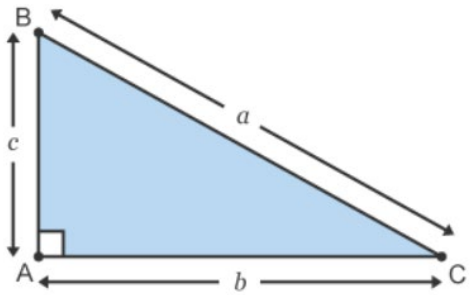
Pythagoras and Surds Student Knowledge Organiser

Pythagoras



$$a^2 = b^2 + c^2$$

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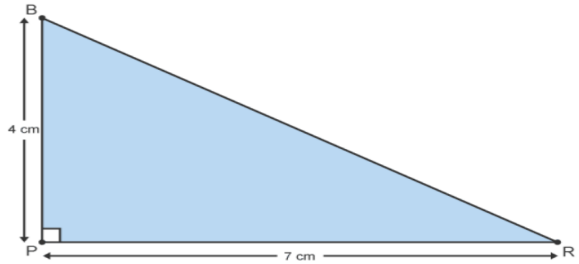
Work out the length of the line BR, correct to 1 decimal place.



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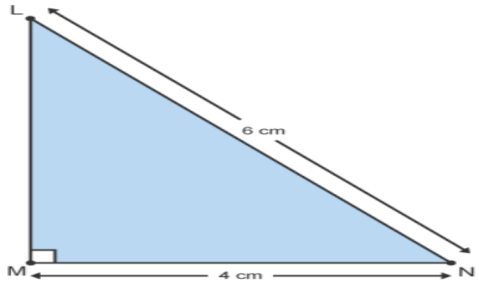
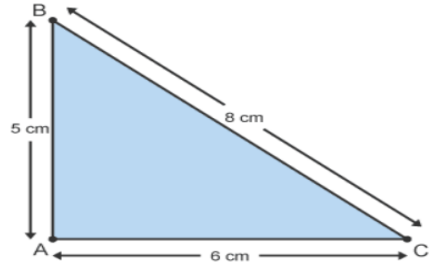
Pythagoras

Work out the length of the line LM, correct to 1 decimal place.



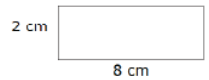
Which of the following triangles is right-angled?

a)

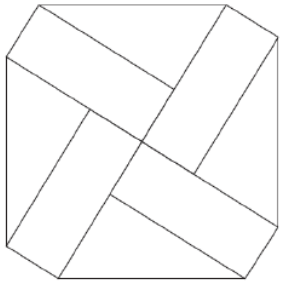


b)

Here is a rectangle.



The 8-sided shape below is made from 4 of these rectangles and 4 congruent right-angled triangles.



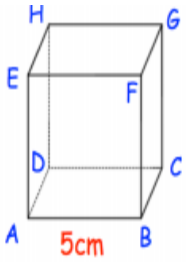
Work out the perimeter of the 8-sided shape.

3D Pythagoras

ABCDEFGH is a cube with side length 5cm.

(a) Work out the length of AC

(b) Work out the length of AG



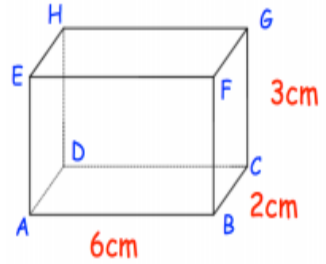
ABCDEFGH is a cuboid.
AB = 6cm, BC = 2cm and CG = 3cm.

(a) Work out the length of BG

(b) Work out the length of BD

(c) Work out the length of HC

(d) Work out the length of AG

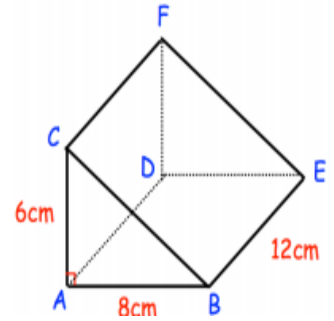


Shown is a triangular prism.
Triangle ABC is a right angle triangle.

(a) Work out the length of BC

(b) Work out the length of CD

(c) Work out the length of BF



Surds Student Knowledge Organiser

Key words and definitions

Integer: a whole number (could be positive or negative)
Prime number: A prime number has only two factors - the number itself and 1. 1 is not a prime number
Rational Number: A number that can be whole or expressed as fraction $\frac{a}{b}$ where a and b are integers
Irrational Number : any number than cannot be expressed as fraction. Generally, means decimal values with no recurring/pattern
Square Number: the result of multiplying an integer by itself
Surd: An irrational number that is better expressed as a square root. If written as decimal they would continue forever with no pattern.

Surds are roots of numbers. Not every Root is a Surd

✓ $\sqrt{5}$ $5\sqrt{6}$ $\sqrt{2}$ $3\sqrt{2}$ $\sqrt{3}$ $\sqrt{11}$ $\sqrt{197}$

✗ $\sqrt{4}$ this can be simplified to 2, which is a rational number

✗ $\sqrt[3]{27}$ this can be simplified to 3, which is a rational number

✗ $(\sqrt{5})^2$ this can be simplified to 5, which is a rational number

Simplifying Surds – Method 2 is linked to Unit 1 work

Method 1

Simplify $\sqrt{24}$.

Here we are looking for the largest square number which is also a factor of 24

Factors of 24:
1 x 24
2 x 12
3 x 8
4 x 6

So $\sqrt{24} = \sqrt{4} \times 6$
$= \sqrt{4} \times \sqrt{6}$
$= 2\sqrt{6}$

Simplify $\sqrt{96}$.

Here we are looking for the largest square number which is also a factor of 96

Factors of 96:
1 x 96
2 x 48
3 x 32
4 x 24
6 x 16
8 x 12

So $\sqrt{96} = \sqrt{6} \times 16$
$= \sqrt{6} \times \sqrt{16}$
$= 4\sqrt{6}$

Method 2

Simplify $\sqrt{24}$.

Using prime factor decomposition and our knowledge that $\sqrt{a}\,\sqrt{b} = \sqrt{a} \times \sqrt{b}$, we can say

24 = 2 x 2 x 2 x 3
So $\sqrt{24} = \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{3}$
$= 2 \times \sqrt{2} \times \sqrt{3}$
$= 2\sqrt{6}$

Simplify $\sqrt{96}$.

96 = 2 x 2 x 2 x 3 x 2 x 2
So $\sqrt{96} = \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{3} \times \sqrt{2} \times \sqrt{2}$
$= 2 \times 2 \times \sqrt{2} \times \sqrt{3}$
$= 4\sqrt{6}$

Adding and Subtracting Surds

$\sqrt{5} + \sqrt{5} = 2\sqrt{5}$ ← think of this like x + x, or 2 lots of x

coefficients are dealt with just like they are in algebra!

$4\sqrt{3} + 7\sqrt{3} = 11\sqrt{3}$
$8\sqrt{2} - 5\sqrt{2} = 3\sqrt{2}$

$2\sqrt{3} - 7\sqrt{5}$ ← $\sqrt{3}$ and $\sqrt{5}$ are UNLIKE TERMS so this cannot be simplified any further

$4\sqrt{7} + 3\sqrt{10} - \sqrt{7} - 2\sqrt{10} = 3\sqrt{7} + \sqrt{10}$

$\sqrt{12} + \sqrt{27} = 2\sqrt{3} + 3\sqrt{3} = 5\sqrt{3}$

$\sqrt{12} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$

$\sqrt{27} = \sqrt{9} \times \sqrt{3} = 3\sqrt{3}$

It is important to try and simplify your surds before working with them so you don't miss things like this!

Multiplying and Dividing Surds

$\sqrt{2} \times \sqrt{5} = \sqrt{2 \times 5} = \sqrt{10}$
$\sqrt{3} \times \sqrt{7} = \sqrt{3 \times 7} = \sqrt{21}$

$\sqrt{a} \times \sqrt{b} = \sqrt{ab}$

$\sqrt{a} \times \sqrt{a} = a$

$\sqrt{2} \times \sqrt{2} = \sqrt{2 \times 2} = \sqrt{4} = 2$
$\sqrt{5} \times \sqrt{5} = \sqrt{5 \times 5} = \sqrt{25} = 5$

$\sqrt{10} \div \sqrt{2} = \sqrt{10 \div 2} = \sqrt{5}$

$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

$\sqrt{12} \div \sqrt{3} = \sqrt{12 \div 3} = \sqrt{4} = 2$

Expanding Single and Double Brackets

Example 1

Expand and simplify $\sqrt{3}(2 + \sqrt{6})$

x	2	$+\sqrt{5}$
$\sqrt{3}$	$2\sqrt{3}$	$\sqrt{18}$

$= 2\sqrt{3} + \sqrt{18}$
$= 2\sqrt{3} + 3\sqrt{2}$

$\sqrt{18} = \sqrt{9} \times \sqrt{2}$
$= 3\sqrt{2}$

Always remember to check if you can simplify your surds

Example 2

Expand and simplify $\sqrt{3}(3\sqrt{8} - 2\sqrt{2})$

x	$3\sqrt{8}$	$-2\sqrt{2}$
$\sqrt{3}$	$3\sqrt{24}$	$-2\sqrt{6}$

24 = 2 x 2 x 2 x 3
So $\sqrt{24} = \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{3}$
$= 2 \times \sqrt{2} \times \sqrt{3}$
$= 2\sqrt{6}$

$= 3\sqrt{24} - 2\sqrt{6}$
$= 6\sqrt{6} - 2\sqrt{6}$
$= 4\sqrt{6}$

Example 3

Expand and simplify $(1 + \sqrt{3})(\sqrt{2} - 1)$

We can treat this just like we do double brackets in algebra!

x	1	$+\sqrt{3}$
$\sqrt{2}$	$\sqrt{2}$	$\sqrt{6}$
-1	-1	$-\sqrt{3}$

none of these are 'like terms' so we cannot simplify anymore!

$= \sqrt{2} - \sqrt{3} + \sqrt{6} - 1$

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Surds Student Knowledge Organiser

Surds are almost exclusively a non- Calculator Topic at GCSE. You can use a calculator to check your answers. Type your question into the calculator, type your answer in, compare them.

Simplifying Surds – Exam Questions

1) $\sqrt{12}$
2) $\sqrt{50}$
3) $\sqrt{72}$
4) $\sqrt{60}$
5) $\sqrt{28}$
6) $\sqrt{96}$
7) $\sqrt{108}$
8) $\sqrt{32}$

Adding and Subtracting Surds

1) $2\sqrt{3} + 3\sqrt{3}$
2) $7\sqrt{7} - 3\sqrt{7}$
3) $7\sqrt{5} - 3\sqrt{5}$
4) $2\sqrt{7} - 3\sqrt{7}$
5) $2\sqrt{32} + 3\sqrt{2}$
6) $2\sqrt{27} - 3\sqrt{3}$
7) $2\sqrt{125} - 3\sqrt{80}$
8) $3\sqrt{24} - 3\sqrt{6}$
9) $\sqrt{108} + 2\sqrt{300}$
10) $5\sqrt{7} + 3\sqrt{28}$
11) $5\sqrt{294} - 3\sqrt{216}$

Multiplying and Dividing Surds

1) $\sqrt{12} \times \sqrt{6}$
2) $\sqrt{50} \times \sqrt{8}$
3) $\sqrt{14} \times \sqrt{28}$
4) $\sqrt{30} \times \sqrt{10}$
5) $\sqrt{15} \times \sqrt{45}$
6) $\sqrt{18} \times \sqrt{15}$
7) $\sqrt{120} \times \sqrt{15}$
8) $\sqrt{32} \times \sqrt{8}$
9) $3\sqrt{2} \times \sqrt{2}$
10) $5\sqrt{5} \times \sqrt{5}$
11) $2\sqrt{3} \times 3\sqrt{3}$

Expanding Single and Double Brackets

1) $\sqrt{2}(1 + \sqrt{2})$
2) $\sqrt{3}(2 - \sqrt{3})$
3) $\sqrt{3}(2\sqrt{3} + 1)$
4) $\sqrt{2}(3\sqrt{2} - 2)$
5) $2\sqrt{2}(1 + 2\sqrt{2})$
6) $3\sqrt{2}(2 - 2\sqrt{2})$
7) $2\sqrt{5}(3 + 4\sqrt{5})$
8) $6\sqrt{2}(\sqrt{2} - 6)$
9) $(1 + \sqrt{2})(2 + \sqrt{2})$
10) $(2 - \sqrt{3})(2 + \sqrt{3})$
11) $(\sqrt{3} + 2)(2\sqrt{3} + 1)$

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Sequences Student Knowledge Organiser

Key words and definitions

Difference – amount between two numbers,
e.g. difference between 8 and 6 = 8 – 6 = 2

Term – A number in a sequence

Nth Term – The term at the nth position

Coefficient – A number in front of an algebraic term
e.g. coeffient of $3a^2$ is 3

Linear sequence – has a constant difference between each term

Quadratic sequence – has a constant second difference between each term

Geometric sequence – has a constant multiplier to get to the next term

Nth term of linear sequences

Find the nth term of the linear sequence below :

5 8 11 14 17

+3 +3 +3 +3 ← constant difference of +3 so coefficient of n is +3

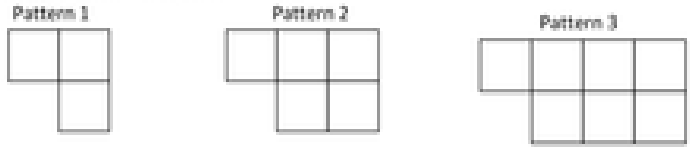
Compare with sequence of +3n

+2: 3 6 9 12 15 / 5 8 11 14 17 ← +3n sequence is just the 3 times tables

Nth term = 3n + 2

For sequences that go up, you will have a **positive** coefficient of n.
For sequences that go down, you will have a **negative** coefficient of n.

Pattern recognition and continuation



When given patterns, turn them into number sequences to help continue and find the nth term of them.
So the sequence above becomes :

3 5 7 . . .

Next pattern will include 9 squares.

Common Sequences to know

Square Numbers – 1 4 9 16 25 36 ….

Cube Numbers – 1 8 27 64 125 ….

Triangle Numbers – 1 3 6 10 15 …

These numbers can be represented as a triangle of dots

Fibonacci sequence - 1 1 2 3 5 8 ….

These numbers are created by adding the two previous terms in the sequence to get the next term

Recognising other sequences

Geometric sequences either multiply or divide by the same number to get to their next term

3 6 12 24 48

x2 x2 x2 x2

256 64 16 4 1

÷ 4 ÷ 4 ÷ 4 ÷ 4

Quadratic sequences are sequences that include an n^2 in the nth term. Use the square numbers sequence to help describe the rule.

3 6 11 18 27 (+ 2)

1 4 9 16 25 ← n^2

So the rule is $n^2 + 2$ or *square numbers increased by 2*

Hegarty Maths Links

Linear sequences – 196, 197, 198

Other sequences – 261, 263, 264

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Sequences Student Knowledge Organiser

Nth term of linear sequences

Find the nth term of these linear sequences :

a) 4 9 14 19 24

b) 1 7 13 19 25

c) 2 4 6 8 10

d) 20 17 14 11 8

e) 11 6 1 -4 -9

f) -20 -24 -28 -32 -36

Other Sequences

Find the next three terms of these sequences:

a) 1 2 4 8 16

b) 1 4 9 16 25

c) 5 10 20 40 80

d) 2 8 18 32 50

e) $\frac{1}{10}$ $\frac{2}{9}$ $\frac{3}{8}$ $\frac{4}{7}$ $\frac{5}{6}$

f) $\frac{1}{3}$ $\frac{1}{12}$ $\frac{1}{48}$ $\frac{1}{196}$

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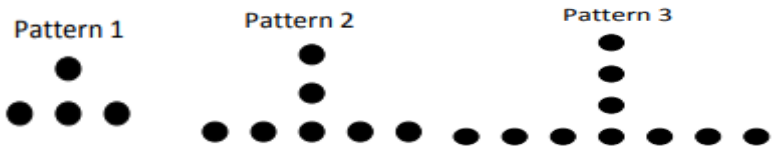
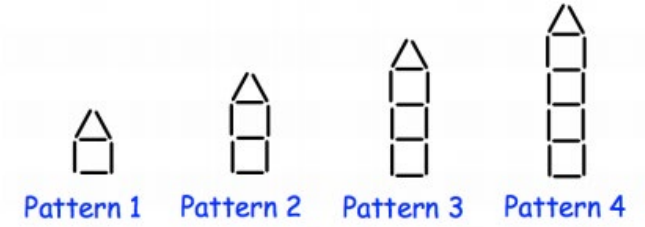
Pattern recognition and continuation



a) How many dots are in pattern 4

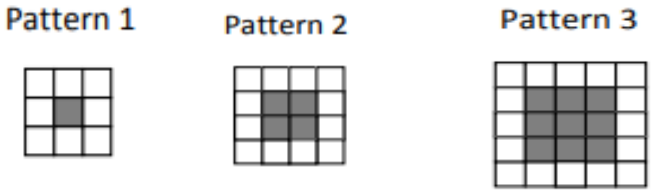
b) Find the nth term of the sequence of dots

c) How many dots will be in pattern 15



a) How many sticks will be used in pattern 5?

b) Find the nth term for the number of sticks



a) How many grey and white squares are in pattern 4

b) Find the nth term for the number of white squares

Fibonacci Sequence

Find the next two terms of these Fibonacci style sequences.

a) 2 4 6 10

b) 5 12 17 29

c) 3 7 10 17

d) -1 -3 -4 -7

Applying knowledge

Q1. Find the **5**th term in each of the linear sequences described below:

a) 2n – 4

b) 3n + 6

c) 20 – 4n

Q2. Jim claims that the term 387 is not in the sequence 4n – 1. Explain why he is correct.

Q3. The first three terms of a different Fibonacci sequence are a b a + b

a) Show that the 6th term of this sequence is 3a + 5b

b) Given that the 3rd term is 7 and the 6th term is 29, find the value of a and the value of b.

Trigonometry Student Knowledge Organiser

Key words and definitions

The HYPOTENUSE (h) is the longest side opposite the right angle

The OPPOSITE side(o) is opposite the angle in the question.

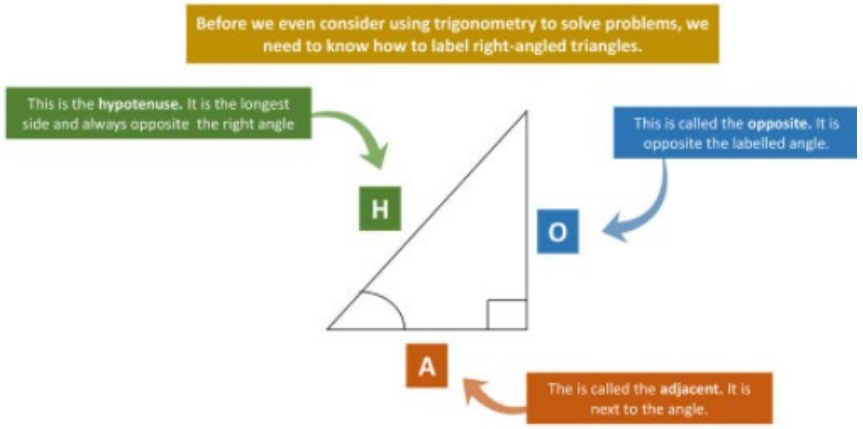
The ADJACENT side (a) is next to the angle in the question

Trigonometric ratios, SIN = $\frac{O}{H}$, COS = $\frac{A}{H}$, TAN = $\frac{O}{A}$

INVERSE trig ratios, used to find the angles in a triangle,

$\sin^{-1} = \frac{O}{H}$ $\cos^{-1} \frac{A}{H}$ $\tan^{-1} \frac{0}{A}$

Labelling a right-angled triangle



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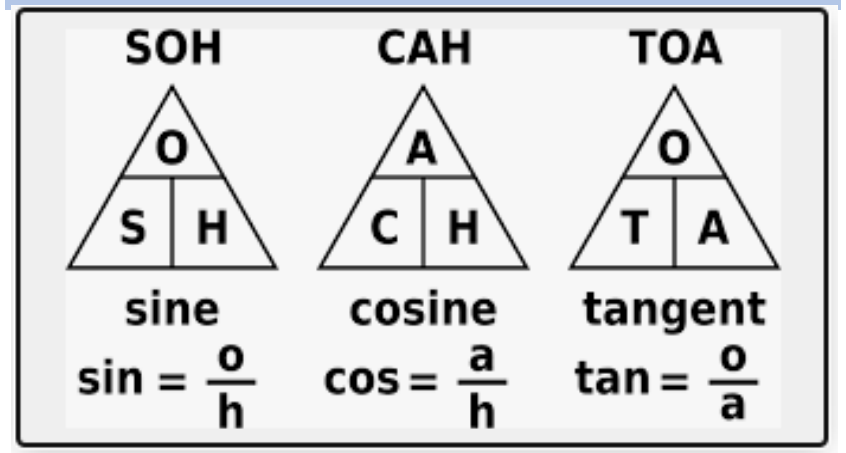
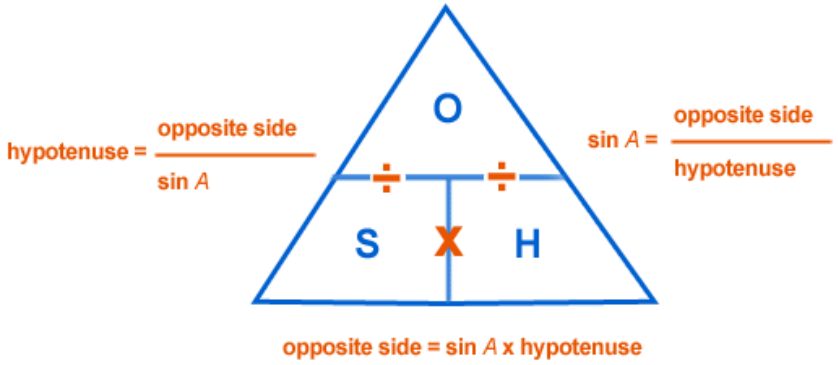
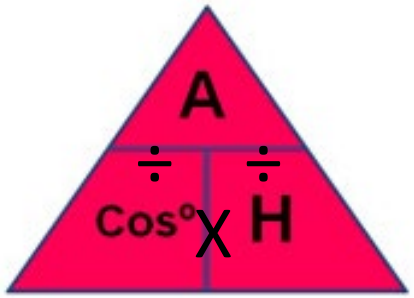
Trigonometric ratios



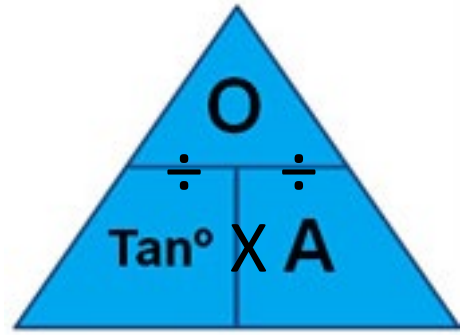
SINE (sin)



COSINE (cos)

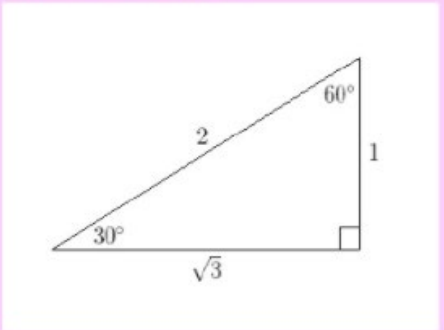


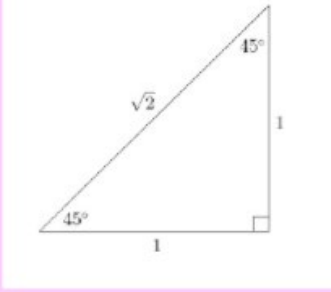
TANGENT (tan)



Special triangles, exact values

Special Triangles:





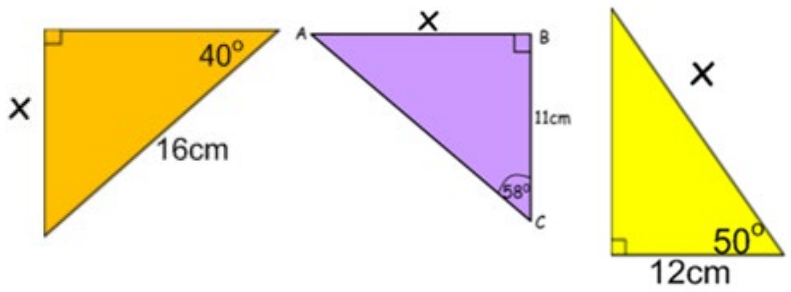
Hegarty Maths Links

508-Trigonometry introduction
509-510 finding sides
511-512 finding angles
513-514 trigonometry multi step
515 trigonometry (elevation/depression)
852-853 non-calculator problem solving
854-863 trigonometry in 3d

Trigonometry Student Knowledge Organiser

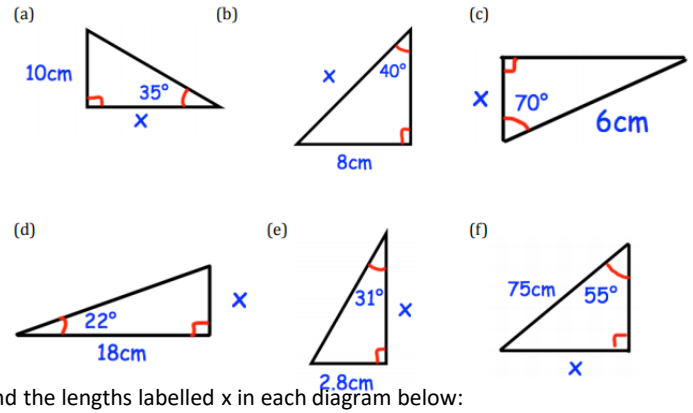
Missing Sides – Which ratio?

Label the sides of the following triangles. Which ratio would you use to calculate the missing side lengths in each one?

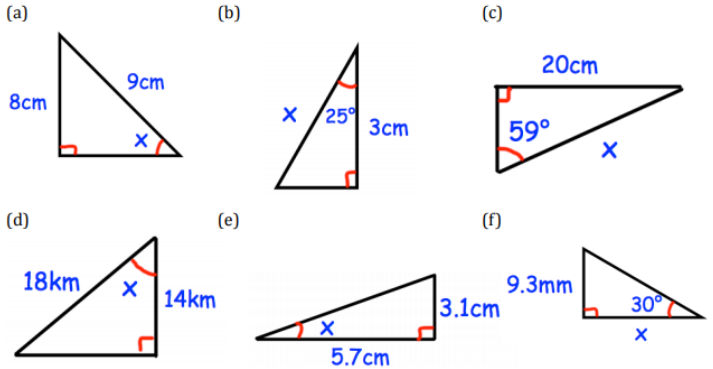


Finding Missing Side Lengths

Find the lengths labelled x in each diagram below:

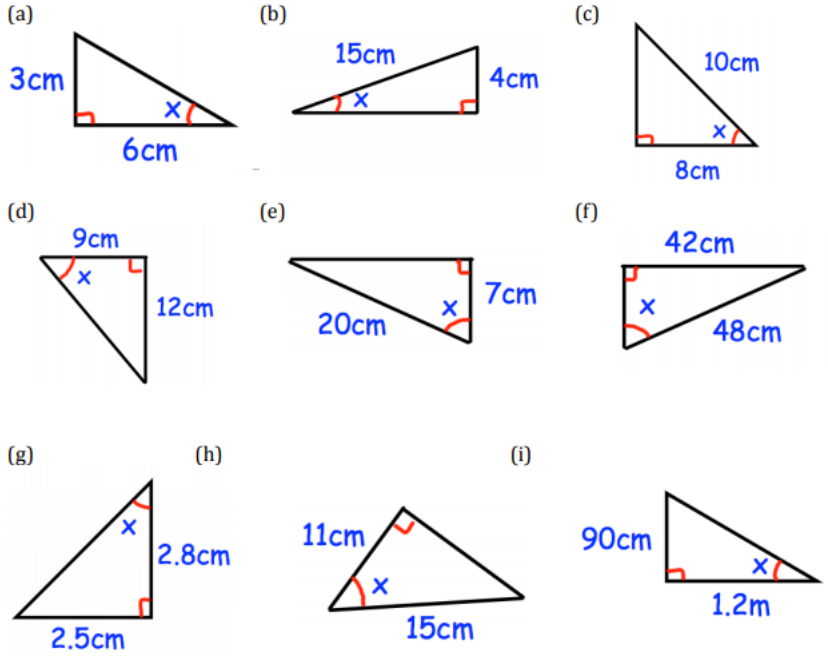


Find the lengths labelled x in each diagram below:



Finding angles

Calculate the size of the missing angles in the triangles below:



Exact values

Write down the exact values of the following:

a) sin 30°

b) cos 0 °

c) tan 45 °

d) sin 90 °

e) sin 0 °

f) cos 60 °

g) tan 0 °

h) sin 45 °

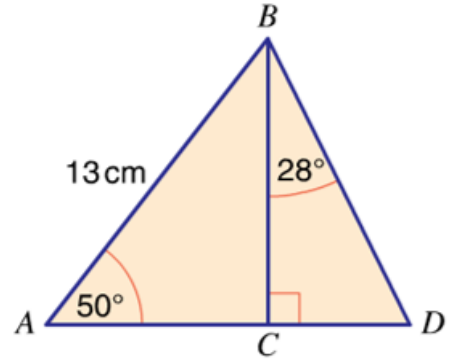
i) cos 30 °

j) tan 60 °

k) cos 90 °

l) sin 60 °

Multi step

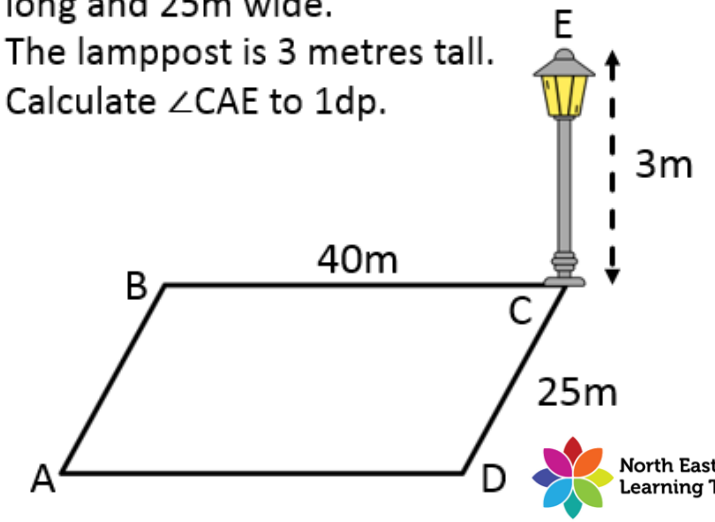


Length of CD

Length of AD

Pythagoras/ Trigonometry in 3d

A lamppost is located in the corner of a rectangular car park. The car park is 40m long and 25m wide.
The lamppost is 3 metres tall.
Calculate ∠CAE to 1dp.



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Probability Student Knowledge Organiser

Key words and definitions

Probability – the chance that a particular outcome will occur

Event – a single result of an experiment

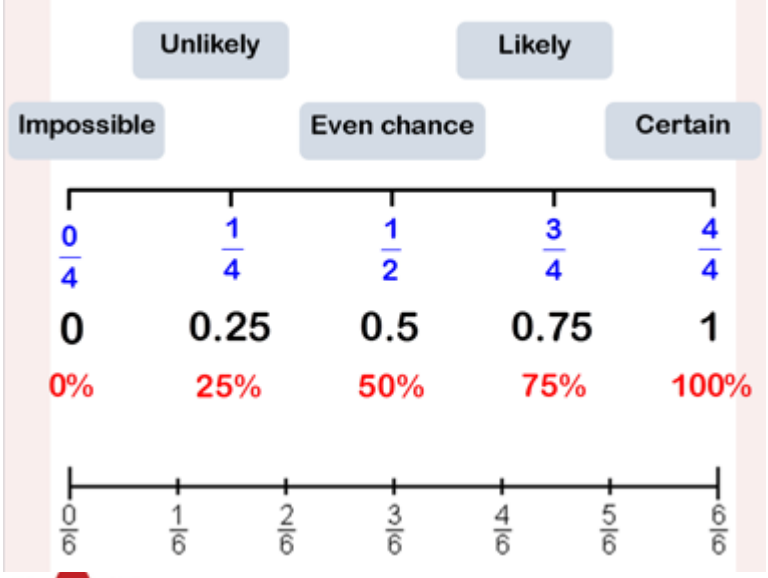
Outcome – one of the possible results of an experiment

Theroretical probability – the probability that an outcome will occur based on all possible outcomes

Experimental probability – derived from the results of an experiment. The total number of successes divided by the total number of trials

Sample space – all the outcomes of an event, presented in table form

Probability scales



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Prior knowledge

Convert between fractions, decimals and percentages

Represent information in a table

Simple Probability

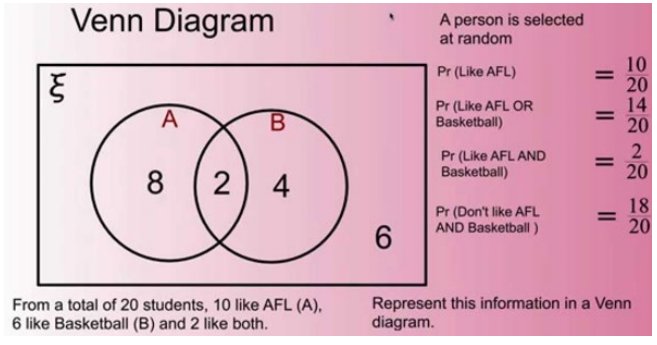
- The probability of an event, denoted P(E), is the likelihood of that event occurring.

The Probability of an Event =

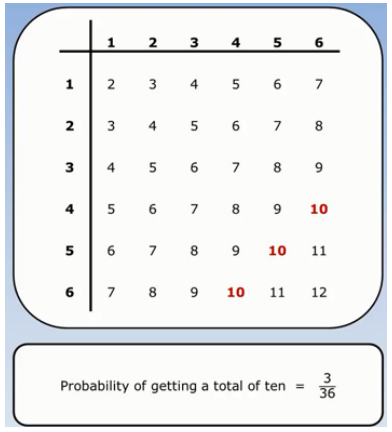
$$P(\text{Event}) = \frac{\text{the number of ways it can happen}}{\text{the number of possible outcomes}}$$

Example – when rolling a die,
P(4) = 1/6 as there is 1 4, and 6 numbers on the die

Venn diagram



Sample space

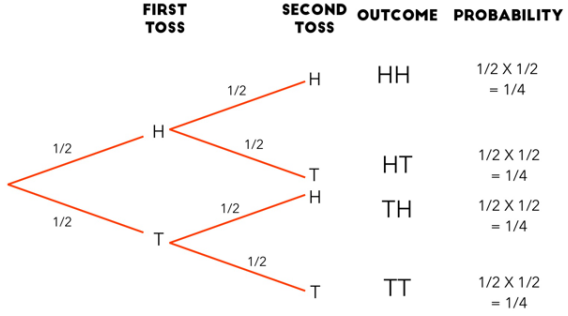


	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Probability of getting a total of ten = 3/36

When rolling 2 dice and adding the scores, the sample space diagram looks like this. The probability of an event can be calculate by counting the number of favourable outcomes and dividing by the total number of outcomes

Tree diagrams



Multiply as you move along the branches

Hegarty Maths Links

Probability of single events – 351, 352, 353

Sample space – 358, 359

Experimental probability – 356, 357

Venn Diagram – 372 – 382

Tree diagram – 361, 362, 363

Probability Student Knowledge Organiser

Basic probability

1. The probability scale goes from 0 to 1. Write down what is meant by each of the following probabilities

   a. 0 Answer: _____

   b. ½ Answer: _____

   c. 1 Answer: _____

2. A bag contains 4 Red, 3 Blue, 2 Green and 1 Yellow marbles. You ask a friend to pick out one marble at random. Calculate the following:

   a. P(Red) =

   b. P(Blue) =

   c. P(Green) =

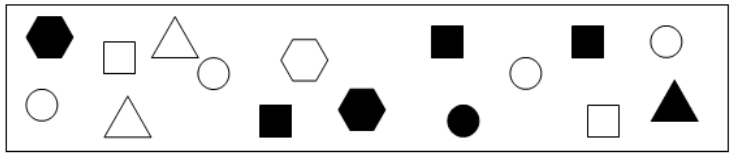
   d. P(Yellow) =

   e. P(Red or Green) =

   f. P(Not Green) =

   g. P(Black) =

3. A box contains the shapes shown below. You ask a friend to pick out one shape at random. Calculate the following:



   a. P(Black Square) =

   b. P(Square) =

   c. P(Circle) =

   d. P(White Hexagon) =

   e. P(Black) =

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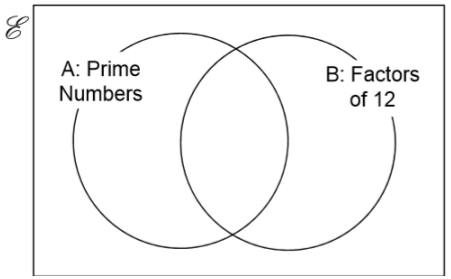
Venn diagrams

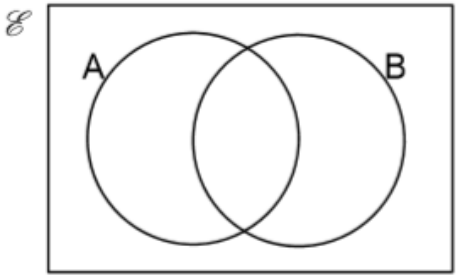
① **Place each element in the correct section of the Venn diagram.**

1 2 3 4 5 6
7 8 9 10 11 12

Elements $\mathscr{E}$



2. $\mathscr{E}$ = {8,9,10,11,12,13,14,15,16}
A = {even numbers}
B = {square numbers}
(a) Complete the Venn diagram.



(b) An element is picked at random. Work out:

P(A') =

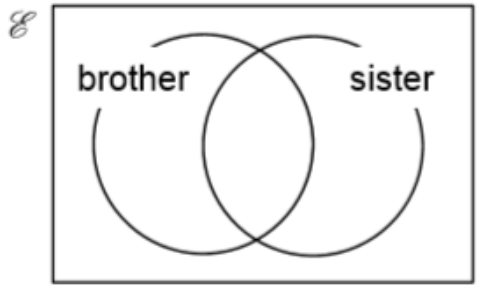
P(B') =

P(A ∩ B) =

P(A ∪ B) =

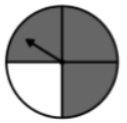
4. In a class of 32 pupils,
23 pupils have a brother,
14 pupils have a brother and a sister,
6 pupils have no brothers or sisters.

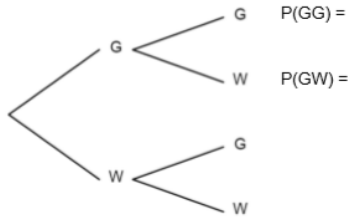
Write the number of pupils who belong in each section of the Venn diagram.



Tree diagrams

1. A spinner has four equally sized sectors: three grey and one white. The spinner is to be spun twice.
(a) Complete the tree diagram.

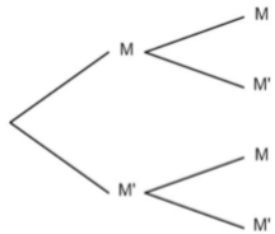




(b) Work out the probability that the spinner will land on the same colour on both spins.

(c) Work out the probability that the spinner will land on grey on at least one of the spins.

3. Angela is playing a game with two fair dice. She rolls both dice and wins a point for each die that lands on a multiple of 3.
(a) Complete the tree diagram, in which M stands for a multiple of 3.



(b) Work out the probability that Angela scores 2 points.

(c) Work out the probability that Angela scores at least 1 point.

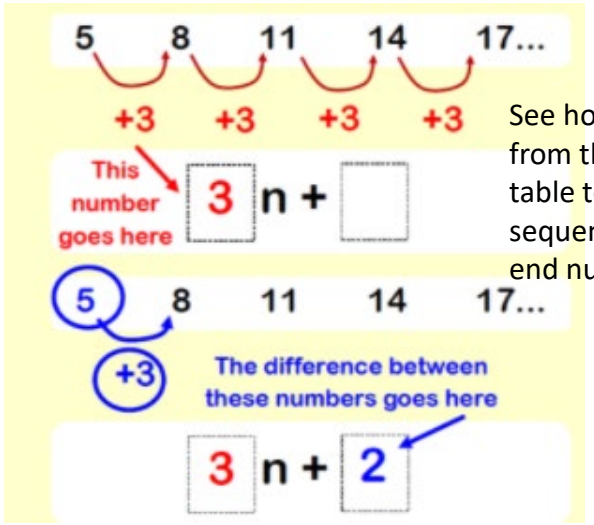
(d) Work out the probability that Angela scores no points.

Sequences Student Knowledge Organiser

Key words and definitions

Sequence-terms or numbers put in a set order.
Term-the numbers/diagrams/letters in the sequence.
Arithmetic-a sequence where the difference between the terms in constant.
Geometric- a sequence where each term is found by multiplying the previous one by a fixed number.
Nth term- the rule of the sequence.

Finding the nth term of a linear sequence



See how you get from the 3 times table to the sequence to find the end number.

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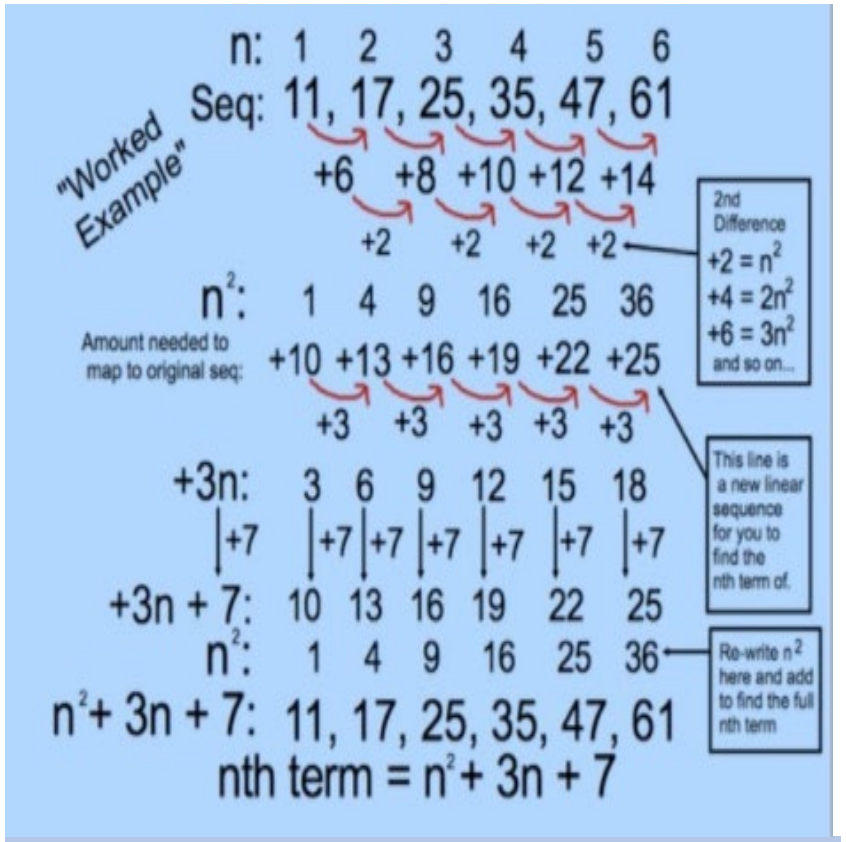
Finding the nth term of a quadratic sequence

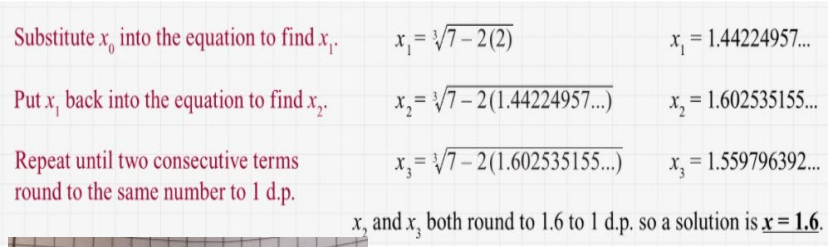


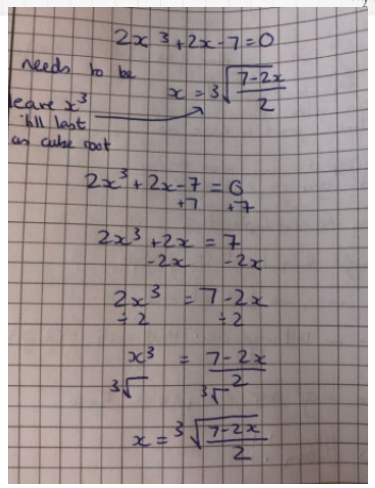
Fibonacci sequences

A Fibonacci sequence is found by adding the two previous terms:

Iteration

Iteration is when you put a starting value into a formula, complete the calculation and put that answer back in until you get the answer you need.





You may also be asked to rearrange a formula in iteration.
This one said to show that the top equation could be wrote as the second.

Hegarty Maths Links

198-Linear sequences (nth term)
248- Find the nth term of a quadratic sequence
927-Finding the nth term of a cubic sequence
263-Fibonacci sequences
264- Geometric sequences
322-Iteration

Sequences Student Knowledge Organiser

Finding the nth term of a linear sequence

Find a formula for the nth term for each of the following sequences.

7, 13, 19, 25...

5, 10, 15, 20...

–1, 1, 3, 5...

78, 69, 60, 51...

–10, –25, –40, –55...

Finding the nth term of a quadratic sequence

Find a formula for the nth term for each of the following sequences.

1, 5, 11, 19, 29...

7, 20, 39, 64, 95...

5, 12, 21, 32, 45...

6, 24, 52, 90, 138...

Iteration

Using $x_{n+1} = 8 - \frac{5}{x_n^2}$

with $x_0 = 1$

find the values of x_1 , x_2 , x_3 and x_4

Show that the equation $x^3 + 2x = 1$ can be rearranged to give

$$x = \frac{1}{2} - \frac{x^3}{2}$$

Using $x_{n+1} = \frac{20}{x_n^2} - 7$ with $x_0 = -9$

find the values of x_1 , x_2 and x_3

Fibonacci sequences

Find the next 3 terms in the Fibonacci style sequences:

2, 4, 6, 10, ...

15, 23, 38, 62, ...

35, 60, 95, 155, ...

0.11, 2.32, 2.43, 4.75, ..

$\frac{1}{11}, \frac{3}{11}, \frac{4}{11}, \frac{7}{11}, \ldots$

Finding the nth term of a cubic sequence

Use the Hegarty Maths clips to help find the nth term in the cubic sequences:

9, 16, 35, 72, 133...

3, 20, 63, 144, 275...

8, 21, 46, 89, 156...

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Probability Student Knowledge Organiser

Key words and definitions

Event: one or more outcomes from an experiment
Outcome: the result of an experiment. I
Intersection: elements (parts) that are common to both sets
Union: the combination of elements in two sets.
Expected Value: the value/ outcome that a prediction would suggest you will get
Universal Set: the set that has all the elements
Systematic: ordering values or outcomes with a strategy and sequence

Combinations

To find the total number of outcomes for two or more events, multiply the number of outcomes for each event together. This is called the product rule because it involves multiplying to find a product.

Example

A restaurant menu offers 4 starters, 7 main courses and 3 different desserts. How many different three-course meals can be selected from the menu?

Multiplying together the number of choices for each course gives $4 \times 7 \times 3 = 84$ different three-course meals.

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Sample Space

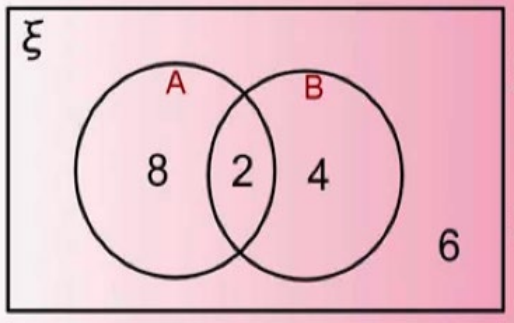
A fair three sided spinner numbered from 1 to 3 is spun and a six sided die is rolled. The scores are added together. Put the results into the probability space diagram below.

Spinner \ Die	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9

What is the probability of the result being

1. 9 $\frac{1}{18}$
2. Less than 4 $\frac{3}{18} = \frac{1}{6}$
3. 7 $\frac{3}{18} = \frac{1}{6}$
4. 1 Zero

Venn Diagrams



Pr (Like AFL) = $\frac{10}{20}$

Pr (Like AFL OR Basketball) = $\frac{14}{20}$

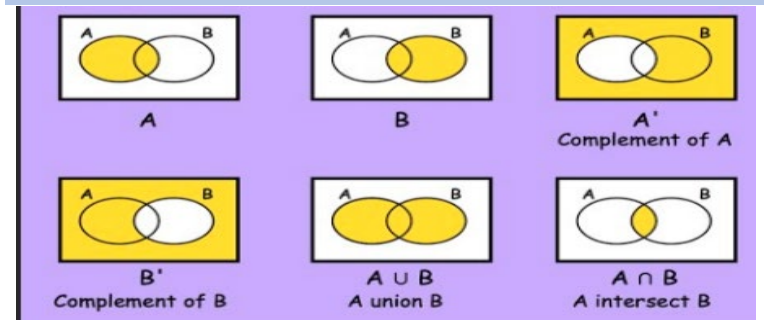
Pr (Like AFL AND Basketball) = $\frac{2}{20}$

Pr (Don't like AFL AND Basketball) = $\frac{18}{20}$

From a total of 20 students, 10 like AFL (A), 6 like Basketball (B) and 2 like both.

Represent this information in a Venn diagram.

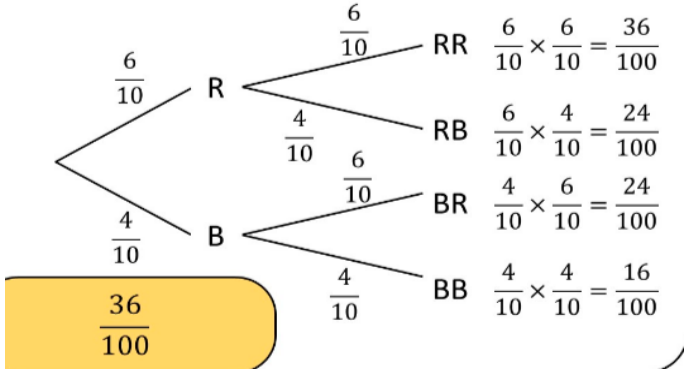
Set notation



Tree diagrams - unconditional

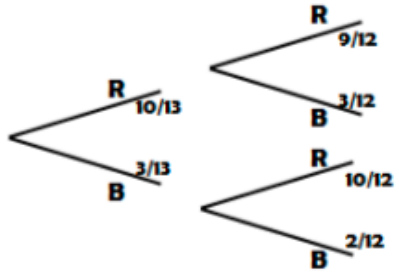
A bag contains 6 red cubes and 4 black cubes.
Jane randomly draws a cube. She **replaces it** and picks another.

What is the probability she picks two red cubes?



Tree Diagrams- conditional

1. A bag contains 10 red balls and 3 blue balls. A ball is chosen and not replaced before a second is chosen. Find the probability that,
a) two red balls are chosen
b) the balls are the same colour
c) the balls are different colours.



a) P(RR) = 10/13 x 9/12
= 90/156

b) P(RR) + P(BB)
= 10/13 x 9/12 + 3/13 x 2/12
= 90/156 + 6/156
= 96/156

c) P(RB) + P(BR)
= 10/13 x 3/12 + 3/13 x 10/12
= 30/156 + 30/156
= 60/156

Hegarty Maths Links

Tree Diagrams 361-362
Set notation 381-382
Sample space 359
Venn diagrams- 378-391

Probability Student Knowledge Organiser

Combinations

There are three dials on a combination lock.
Each dial can be set to one of the numbers 1, 2, 3, 4, 5
The three digit number 553 is one way the dials can be set, as shown in the diagram.

(a) Work out the number of different three digit numbers that can be set for the combination lock.

.....

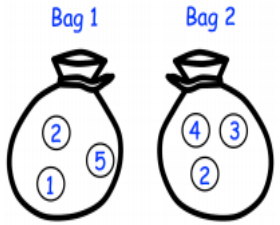
(2)

(b) How many of the possible three digit numbers have three different digits?

Sample Space

Question 1

Two bags, 1 and 2, each contain three counters.
In bag 1, the counters are labelled 1, 2 and 5.
In bag 2, the counters are labelled 2, 3 and 4.



A counter is drawn at random from bag 1 and a counter is drawn from bag 2.

The two numbers are multiplied together to give a score

(a) Complete the table to show all possible scores

(b) Find the probability of scoring a 6

(c) Find the probability of scoring a multiple of 4

(d) Find the probability of scoring an odd number

Bag 1

Bag 2	x	1	2	5
	2			
	3			
	4			

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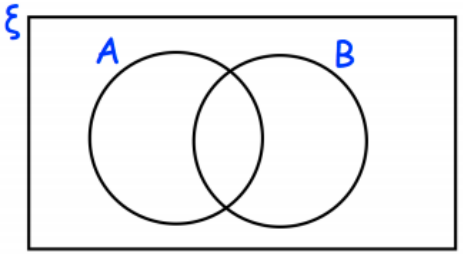
Venn Diagrams and set notation

ξ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16}

A = multiples of 3
B = multiples of 5

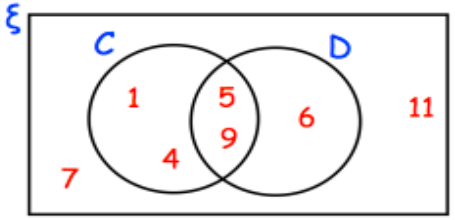
(a) Complete the Venn diagram



One of the numbers is selected at random.

(b) Write down P (A ∩ B)

2. Here is a Venn diagram



Write down the numbers that are in set

(a) D

.....

(b) C ∪ D

.....

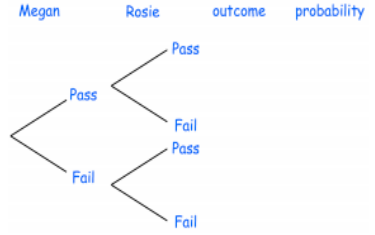
(c) C'

.....

Tree Diagrams

Megan and Rosie sit their driving tests.

The probability that Megan passes the test is 0.8
The probability the Rosie fails the test is 0.3



(a) Copy and complete the tree diagram

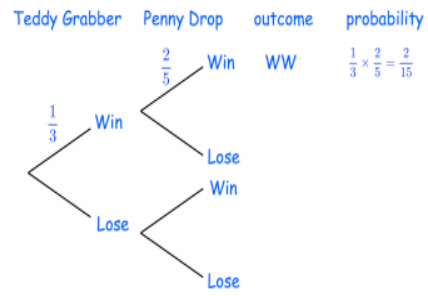
(b) Find the probability that both women pass

(c) Find the probability that Megan fails and Rosie passes

(d) Find the probability that at least one woman passes

(3)

Harry goes to an arcade. He has one go on the Teddy Grabber and one go on the Penny Drop.
The probability that he wins on the Teddy Grabber is ⅓
The probability that he wins on the Penny Drop is ⅖



(a) Copy and complete the tree diagram

(b) Work out the probability that Harry loses on the Teddy Grabber and he also loses on the Penny Drop

(c) Work out the probability that Harry wins on exactly one machine

The probability that a bus arrives late is 0.1

Victor is travelling by bus on Monday and Tuesday.

(a) Show this information on a tree diagram

(b) Calculate the probability that the bus is on time both days.

Transformations Student Knowledge Organiser

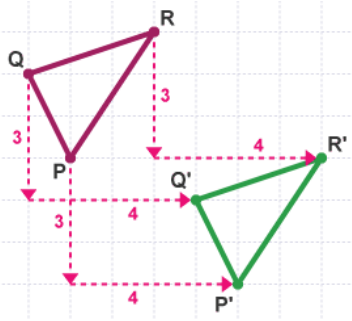
Key words and definitions

Centre of Enlargement- The point that a shape is enlarged from.
Centre of Rotation- The point that you place your pencil on the rotate a shape.
Enlargement- Making a shape bigger or smaller.
Rotation- Turning a shape around.
Reflection- Drawing the mirror image of a shape.
Scale Factor- How many times bigger or smaller you make a shape.
Transformation- Changing a shape.
Translation- Moving a shape.
Vector- A pair of numbers written one on top of the other that describe how a shape is translated.

Clockwise

Anti-clockwise

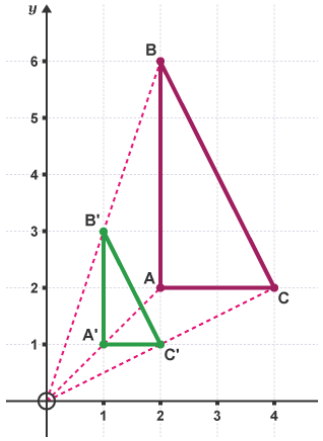
Translations



To translate a shape you move it a given number of squares, up down left or right.
These could be given as a vector, the first number in the vector saying how far left and right, and the second number saying how far up or down. Up and right as positive numbers, down or left are negative numbers.
E.g. In the diagram PQR has been translated to P'Q'R' by the vector $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$.

When describing a translation state the vector it has been translated by.

Enlargements



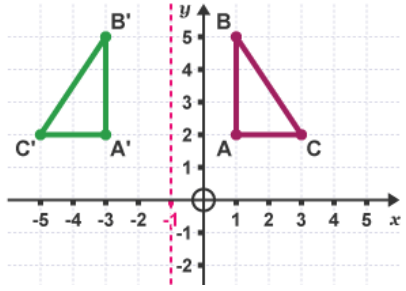
When enlarging a shape, you'll be given a **scale factor**, this is number that tells you how many times bigger a shape is getting. You will also be given a **centre of enlargement**, when you enlarge your shape the distance from the centre of enlargement is also enlarged.

If you get a fractional scale factor, it make the shape smaller not larger.
For example on the question above the shape ABC has been enlarged by ½ and has a centre of enlargement at (0,0).
If you've enlarged your shape correctly you should be able to draw a straight line from each corresponding corner to the centre of enlargement.

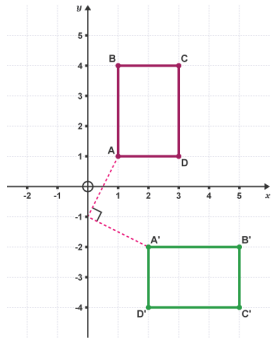
When describing an enlargement always state the scale factor and centre of enlargement, this can be found by drawing lines connecting the corresponding corners and seeing where they cross.

Reflection

To reflect a shape draw its mirror image on the opposite side of the reflection line, ensuring it's the same distance from the line as the original shape.
When describing a reflection always state the equation of the line it has been reflected.



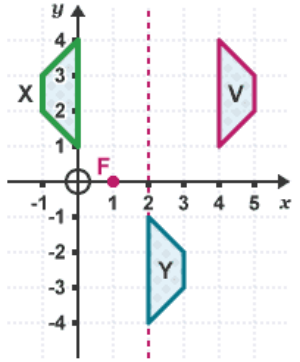
Rotations



To rotate a shape:
1) Draw your shape onto tracing paper
2) Use your pencil to pin your tracing paper to the page with the tip on the centre of rotation.
3) Rotate the shape round the correct number of degrees. Then, using this as reference, draw the shape in the correct position.

When describing a rotation always state how many degrees its rotated, whether its clockwise or anti-clockwise, and what the centre of rotation is.

Combined



Sometimes transformations can be combined.
For example in this question V has been reflected in the line x=2 to get X, then X has been rotated 180° around the point (1,0).
When doing multiple transformations do one part at a time, drawing each shape a long the way.

Hegarty Maths Links

Translations-637 and 638

Enlargements- 642-647

Reflections- 639-641

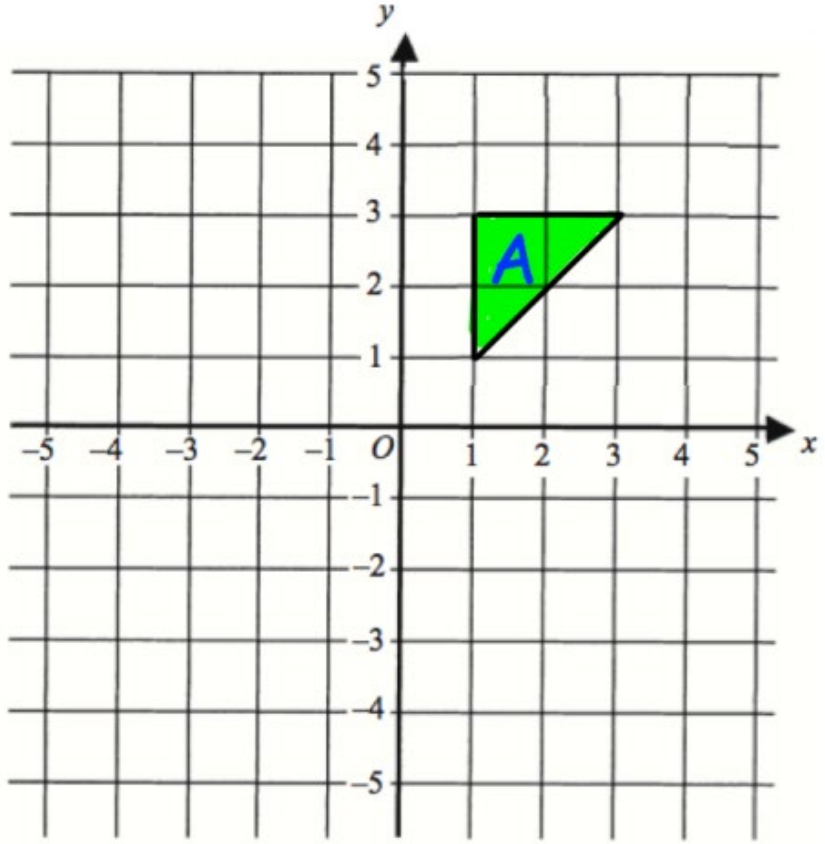
Rotations- 648-649

Describing Transformations- 650-654

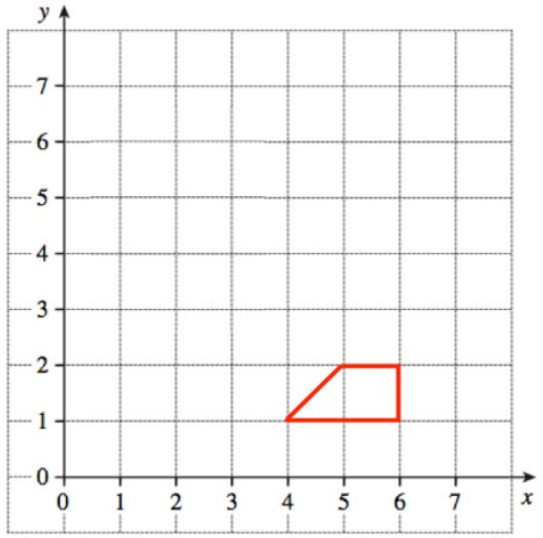
Combined Transformations- 656-657

Transformations Student Knowledge Organiser

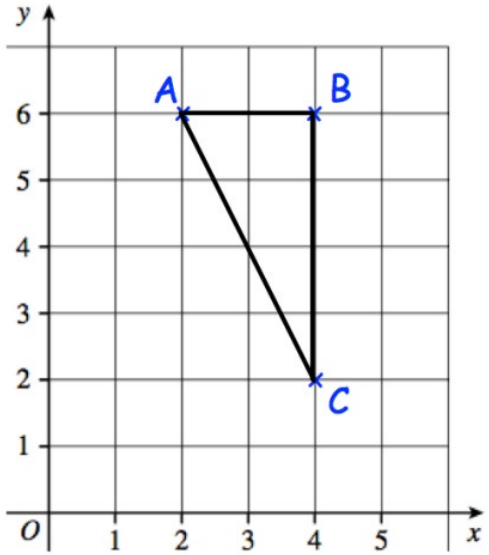
a) Translate shape A by the vector $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$, name it shape B
b) Reflect shape A in the line y=-1, name it shape C
c) Rotate shape A 180° clockwise around (0,0), name it shape D



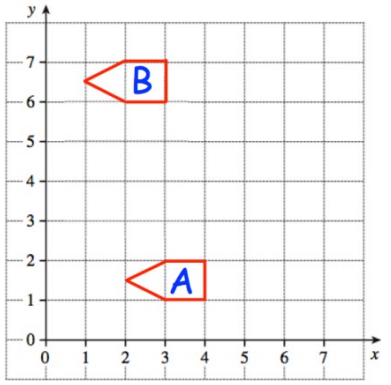
Enlarge the trapezium by a scale factor of 2, centre (7,0)



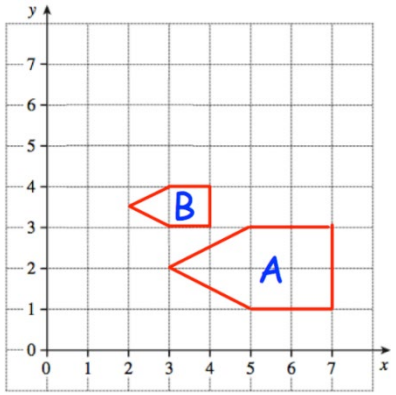
Enlarge the triangle by a scale factor of ½ , centre (0,0)



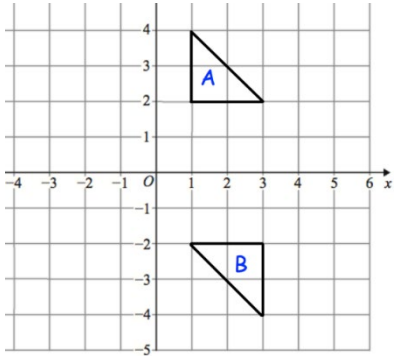
Describe the transformation of Shape A to Shape B



Describe the transformation of Shape A to Shape B



Describe the transformation of Shape A to Shape B



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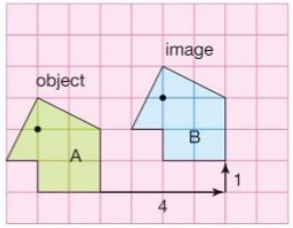
Transformations Student Knowledge Organiser

Key words and definitions

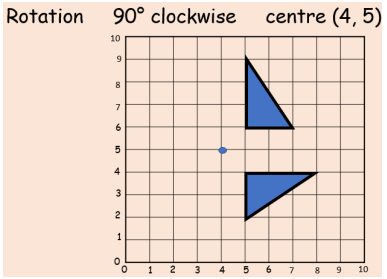
Enlarge – To make a shape larger (or Smaller)
Reflect – To produce an image of a shape as seen in a mirror
Rotate – To turn a shape about a centre point
Translate – To move a shape left or right and up or down
Column Vector - Used to describe a translation $\begin{pmatrix} x \\ y \end{pmatrix}$ with x being left or right, y being up or down.
Congruence – Two shapes are congruent if they are both the same size and shape.
Similarity – Two shapes are similar if one is an enlargement of the other.
Scale Factor – By multiplying each side of a shape by this number you produce an image that has been enlarged.

Translation

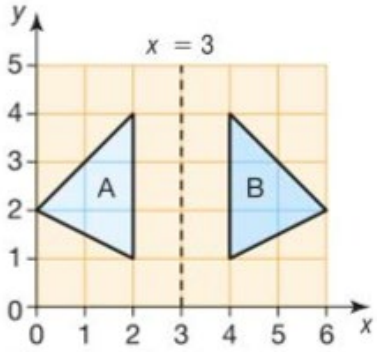


The shape is translated by $\begin{pmatrix} 4 \\ 1 \end{pmatrix}$.

Rotation



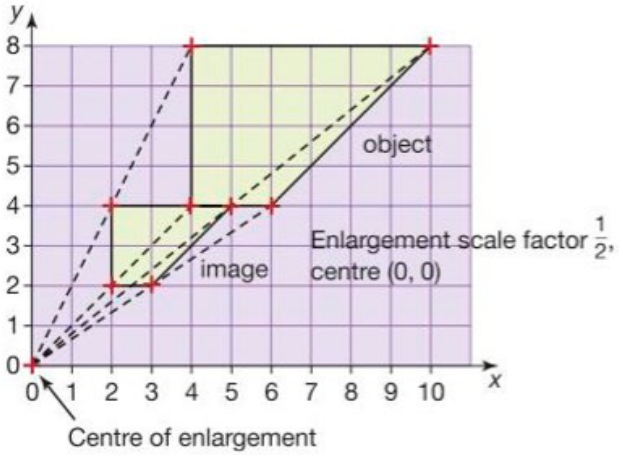
Reflection



The mirror line is $x = 3$.

Enlargement

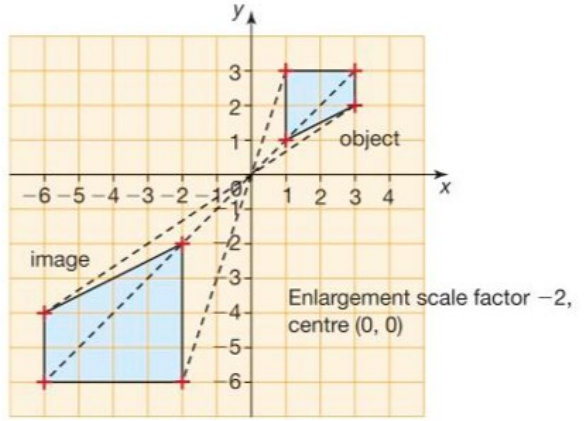
Enlargement with a fractional scale factor reduces the size of the shape.



Scale factor $\frac{1}{2}$: all lengths on the image are half the corresponding lengths on the object.

Enlargement – Negative Scale factor

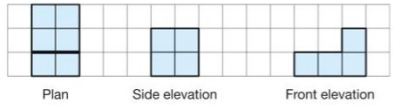
Enlargement with a negative scale factor produces a shape upside down on the opposite side of the centre.



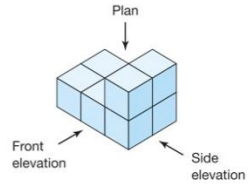
Scale factor −2: all lengths on the image are twice the corresponding lengths on the object; the image is inverted.

Plans and Elevations

- A **plan** of a solid is the view from directly overhead (bird's eye view).
- An **elevation** is the view from the front or the side of the solid.



Notice the extra bold line in the plan, when the level of the cubes alters.



Hegarty Maths Links

Translations – 637,638
Reflections – 639-641
Rotations – 648,649
Enlargement – 642 – 647
Describing Transformations – 650 – 654
Combined Transformations – 656,657
Similarity - 608-614
Plans and Elevations – 837-844

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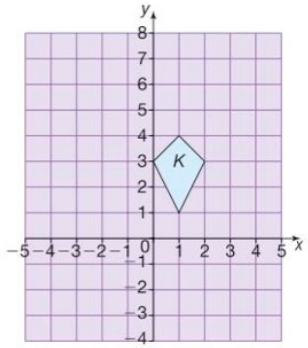
Transformations Student Knowledge Organiser

Translation

Copy this diagram.

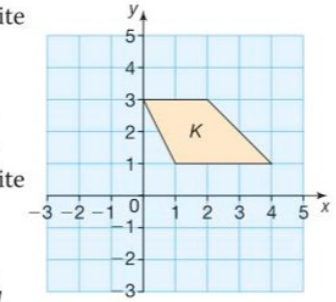


a Translate the kite K by the vector $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$. Label the image L.

b Translate the kite K by the vector $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$. Label the image M.

Rotation

Copy this diagram.

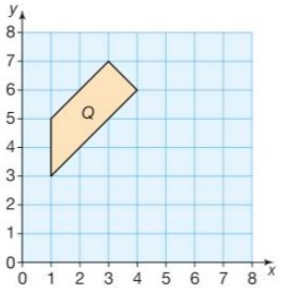


a Rotate the kite K through 180° about (1, 1). Label the image L.

b Rotate the kite K through −90° about (2, 0). Label the image M.

Reflection

Copy this diagram and extend the y-axis to −8.



a Reflect the quadrilateral Q in the x-axis. Label the image R.

b Reflect the quadrilateral Q in the line $y = x$. Label the image S.

Describing Transformations

Describe fully the transformation that maps

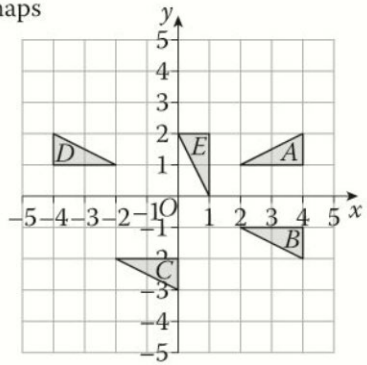
a triangle A to triangle B

b triangle C to triangle B

c triangle B to triangle D

d triangle D to triangle A

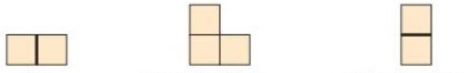
e triangle E to triangle A.



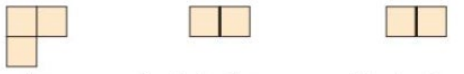
Plans and Elevations

The plan, front elevation and side elevation are given for these solids made from cubes. Draw a 3D sketch of each solid and state the number of cubes needed to make it.

a



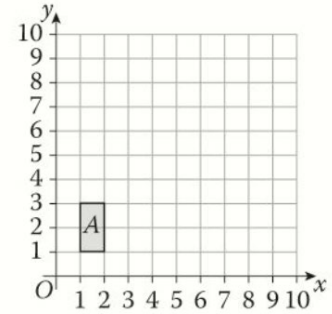
b



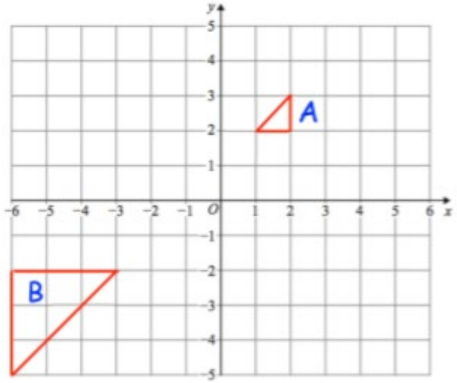
Enlargement

Copy this diagram.

Enlarge rectangle A by scale factor 3, centre (0, 0). Label the image B.



Describe fully the single transformation that takes shape A to shape B.



Combinations of Transformations

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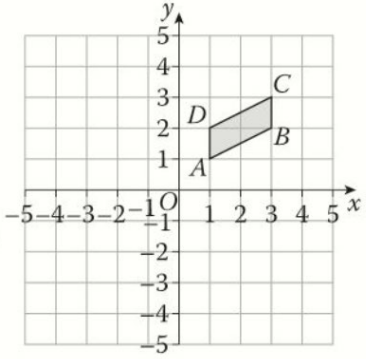

a Reflect $ABCD$ in the x-axis, and label the image $A'B'C'D'$.

b Rotate $A'B'C'D'$ by 180° about the origin, and label the image $A''B''C''D''$.

c Find the single transformation that maps $ABCD$ to $A''B''C''D''$.

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Y9 ART: ANIMALS

Key Figures	
	**Sarah Esteje** is an illustrator and photographer born in 1987. She studied art in Paris at both LISAA and Gobelins School of the Image, Paris.
	**Franz Marc** (1880-1916) was a German painter and printmaker, one of the key figures of German Expressionism.
	**Henri Rousseau** (1844-1910) was a French painter who was known for his richly coloured and meticulously detailed pictures of lush jungles, wild beasts, and exotic figures.
	**Poly Printing** is a process of using a polystyrene sheet to create repeat prints.

Key Terms	
Abstract	Relating to or denoting art that does not attempt to represent external reality, but rather seeks to achieve its effect using shapes, colours, and textures.
Amalgamation	The action, process, or result of combining or uniting.
Background	The part of a picture, scene, or design that forms a setting for the main figures or objects, or appears furthest from the viewer.
Biro Pen	A ballpoint pen, also known as a biro, ball pen, or dot pen is a pen that dispenses ink over a metal ball at its point, i.e. over a "ball point".
Blending	The technique of gently intermingling two or more colours or values to create a gradual transition or to soften lines.
Collage	The process of layering materials such as paper onto a background.
Colour	What the eye sees when light is separated.
Colour symbolism	Colour symbolism is the use of colour as a representation or meaning of something that is usually specific to a particular culture or society.
Form	An element in art where an object appears to have three-dimensions.
Illustrator	A person who draws or creates pictures for magazines, books, advertising etc.
Line	A line is a mark made in art. A line has a width and a length. A line can be straight, curved, continuous, dashed or broken.
Line drawing	Any image that consists of distinct lines placed against a background, without gradations in shade or hue.
Poly print	A method of printmaking using polystyrene sheets.
Printmaker	A person who makes pictures or designs by printing them from specially prepared plates or blocks.
Tone	Light to dark shade used to create form in an artwork.
Two-dimensional	Flat in appearance – without thickness.

SMSC Creative thinkers, Cultural, Reflective learners

Timeline

Knowledge links: Science, English, Technology, Geography, History,

45000 Years Ago

Ancient humans sketched out the forms of animals on cave walls.

1905

Franz Marc starts painting and depicting animals in his work.

1908

Picasso throws a banquet in Rousseau's honour

1920's

German Expressionism is founded.

2014

Sarah Esteje starts to share her artwork on social media.

RESEARCH & BACKGROUND INFORMATION

Introduction:

You need to introduce your investigation telling the reader:

- Why you have chosen this task
- What you need to investigate in order to complete the task
- How you plan to investigate (internet, books, visits, etc)

This should take up ½ a page on the rest on the page you should start your background information (see below)

Background information:

Use the internet, recipe books, menus to complete the following questions:

- How is 'International Cuisine' defined? Find the definition on an online dictionary.
- What influences the cuisines (or cookery) of particular countries?
- Who or what promotes or affects international cuisine? (think about celebrity chefs, importing food goods, foods grown in the country, weather, price of ingredients)
- What is the customer demand in the UK for international food (ethnic groups who live in the UK, international travel, speed of importing goods)?
- Explain the impact that international cuisines have had in your area (range of food outlets, food ranges in supermarkets, carnivals). How many _____ restaurants in Peterlee are there? How many _____ restaurants are there in Shotton? Use www.yell.com

1 mark

- Investigate the quality and range of manufactured international food available to the caterer. (go onto www.asda.co.uk and compare two ready meals from the country of your choice. Comment on the cost, packaging, ingredients used, presentation, nutritional content per portion- Are they healthy? Do these products meet government guidelines?- 5 a day, balanced diet. Do they contain additives/colourings.) Type up your findings. You must consider the nutritional content of these foods.

Choose one country to investigate in more depth. ,

- Background information
- The country I have chosen to study in more depth is…..
- This is because…..
- It has a population of…… people
- The religion in this country is …..
- The staple foods of this country are…
- The foods that grow in this country are…
- The following are traditional dishes….
- **Conduct a survey or visit to a restaurant.**

Write a conclusion at the end of your research.

Italian

Basic skills	Medium skills	High skills
1. Tiramisu with store bought sponge fingers 2. Pizza using shop bought base 3. Bruschetta + simple topping	1. Vegetable lasagne with store bought pasta 2. Focaccia 3. Grissini (breadsticks) 4. Ciabatta bread 5. Risotto (any type) 6. Pizza 7. Spaghetti bolognaise 8. Cannelloni with shop bought pasta tubes 9. Arabiata sauce and shop bought pasta 10. Store bought pasta with homemade sauce 11. Ricotta cheesecake (medium?) 12. Individual Spinach and ricotta bread and butter pudding	1. Tiramisu (med?) 2. Panna Cotta 3. lasagne with HMD pasta 4. mascarpone and homemade pesto stuffed chicken breast wrapped in parma ham and served with a mushroom risotto stuffed pepper 5. tiramisu torta 6. salmon with salsa verde and accompaniments 7. chicken carbonara served with tagliatelle HMD pasta 8. Chicken parmesan 9. Gnocchi 10. Any homemade pasta with homemade sauce 11. Parmesan crisps (garnish) 12. Biscotti (accompaniment) 13. Sweet ravioli with mascarpone and honey HMD pastry 14. Spinach and ricotta cannelloni HMD pasta

Year 9 - Computing - Advanced Image Editing - Knowledge Organiser

Key Words	
Vector Image	• Is created in graphics packages and consist of shapes called objects. • Even if an object in a vector graphic is quite large, it doesn't need a lot of computer. memory. Therefore the file size of a vector graphic is often very small. • Are scalable - i.e. when you resize them, they do not lose quality.
Bitmap (raster) Image	• Is composed of many tiny parts, called pixels. The pixels are often many different colours. • It is possible to edit each individual pixel. • Since the computer has to store information about every single pixel in the image, the file size of a bitmap graphic is often quite large. • Are NOT scalable – i.e. when you resize a bitmap graphic, it tends to lose quality.
Manipulation	• Transforming or altering an asset using methods/techniques to achieve desired results.
Composition	• Is the result of 2 or more images that have been combined or overlaid.
Layer	• Photoshop layers are like sheets of stacked acetate. • Transparent areas on a layer let you see layers below. You use layers to perform tasks such as compositing multiple images, adding text to an image, or adding shapes.
Client brief	• Outlines the client's objectives, expectations, target audience, budget, timeline, and any specific requirements or constraints that must be considered
Target audience	• A group of people identified as likely customers of a product. The product should be developed with them in mind so they are more likely to buy.

Why someone might use Photoshop to manipulate an image.

- To improve it in some way, e.g. by removing a spot from a supermodel's nose!
- To use as proof that something actually happened, e.g. UFO flying over your house!
- To provoke a shock reaction.
- To create a piece of art.

File Types.

- . JPG (Lossy) - Joint Photographic Experts Group, does not keep transparency.
- . PNG (Lossless) - Portable Network Graphic, good for images in colour, larger file size than a jpeg, keeps transparency.
- . TIFF (Lossless) - Tagged Image File Format, not used on the WWW due to its very large file size, file standard in printing.

Shortcuts

Ctrl + D	Deselect
Ctrl + T	Free transform
Ctrl + alt + z	Go backwards a step
Ctrl + "-" (or use +)	Zoom in and out

Layer effects

Warping Text

Year 9 Sentence Builder 7
Travel and transport

Je vais [I go]

il/elle va [he/she goes]

nous allons [we go]

j'utilise [I use]

il/elle utilise [he/she uses]

nous utilisons [we use]

je prends [I take]

il/elle prend [he/she takes]

nous prenons [we take]

parfois
quelquefois
[sometimes]

souvent
[often]

tout le temps
[all the time]

de temps en temps
[from time to time]

rarement
[rarely]

toujours
[always]

tous les jours
[every day]

régulièrement
[regularly]

en bus [by bus]

en train [by train]

en bateau [by boat]

en voiture [by car]

en avion [by plane]

à vélo [by bike]

à pied [on foot]

le bus [the bus]

le train [the train]

le bateau [the boat]

la voiture [the car]

l'avion [the plane]

afin de / d'

pour

[in order to]

aller au collège [to go to school]

visiter la famille [to visit family]

sortir avec les amis [to go out with friends]

rencontrer les amis [to meet friends]

aller aux magasins [to go to the shops]

faire de l'exercice [to do some exercise]

aller à la plage [to go to the beach]

aller en vacances [to go on holiday]

aller à l'étranger [to go abroad]

Year 9 Sentence Builder 8
The environment

Récemment [Recently] Hier [Yesterday] La semaine dernière [Last week]	je suis allé [I went]	en voiture [by car] en avion [by plane]	mais dans le futur [but in the future] mais demain [but tomorrow]	je recyclerai [I will recycle]	le verre [glass] le papier [paper] les bouteilles [bottles]
	j'ai utilisé [I used]	trop d'électricité [too much electricity] tant d'eau [so much water] trop de plastique [too much plastic]		j'utiliserai [I will use] je n'utiliserai pas [I won't use]	moins d'électricité [less electricity] autant d'eau [as much water] les transports en commun [public transport] le bus / le train / mon vélo [the bus / the train / my bike]
	j'ai pris [I took]	un bain [a bath] la voiture [the car]		je prendrai [I will take]	une douche [a shower] les transports en commun [public transport] le bus / le train / mon vélo [the bus / the train / my bike]

Popular Music – Y9 T3

Common Instruments

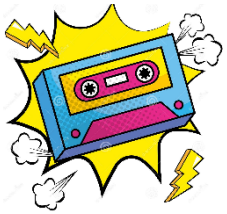
Vocals

Keyboard/Piano/Synthesiser

Guitar (Electric and Acoustic

Bass Guitar

Drums



Common Structures

32 Bar Song Form – AABA, 8 bars each

Strophic – same melody, different lyrics

12 Bar Blues – 12 bars (1111, 4411, 5411)

Verse – repeated often with different words

Chorus – repeated after each verse

Riffs – a repeated phrase

Middle 8 – section in the middles of the song. Used to break it up between verses/chorus

Bridge – short contrasting section to transition

Fill – short drum solo

Instrumental Break – only instruments play

Intro/Outro – beginning/end of a song

Common Features

Improvisation – making it up on the spot

Melismatic – lots of notes to one syllable

Syllabic – one note per syllable

Syncopation – off beat

Driving rhythms – push the music forward

Primary Chords – Chords 1, 4 and 5

Secondary Chords – the dominant chord of one of the other major or minor triads

Music Technology

Loop – an idea recorded and repeated over

Sample – a short clip of previously recorded music

Panning – making sound come from the left or right speaker

Phasing – an effect that combines an audio signal with a short delay to create phase differences. A bit like a place passing by!

Computer Generated Sounds – sounds made by a computer

Synthesised/Electronic – music produced by electronic means

Reverb – an effect that can be added to voices/instruments that makes them sound like they are in a concert hall (or bathroom!)

Echo – a delay effect by repeating the sound slightly after the original

Amplified – sounds made louder by means of electronic signal

Acoustic – natural sound

Common Styles

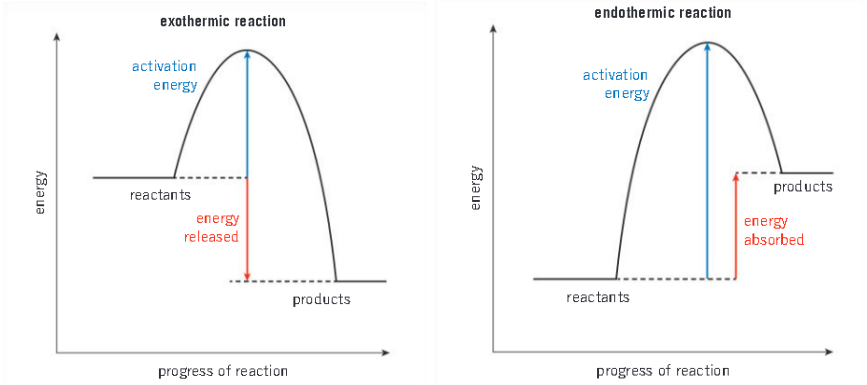
Pop	Fusion	Soul
Rock	Reggae	Hip Hop
Rap	Minimalism	Ballad

Year 9 Science
Chemical Changes

Energy changes

During a chemical reaction, **energy** is transferred either:

- to the surroundings – **exothermic** – temperature of the surroundings **increases**
- from the surroundings – **endothermic**- temperature of the surroundings **decreases**



Bond energies

Chemical bonds occur between atoms. In order for a chemical reaction to occur, bonds are broken before new ones are made between different atoms.

- Breaking bonds- **endothermic- energy is taken in**
- Making bonds – **exothermic – energy is released**

Bond energy example calculation

Bond energy values can be used to predict whether a chemical reaction will be exothermic or endothermic.

Taking the following reaction as an example:

$H_2 + Cl_2 \rightarrow 2HCl$

Bond type	Bond energy (kJ/mol)
H-H	436
Cl-Cl	243
H-Cl	432

Overall energy transferred = **energy required to break bonds** - **energy released when making bonds**

The energy required to break bonds in H2 and Cl2 is 436 + 243 = 679 kJ/mol

The energy released on making bonds in HCl is (2x432) = 864 kJ/mol

Overall energy transferred = 679-864 = -185 kJ/mol → exothermic

Summary

Reaction	Energy transfer	Temperature changes	Examples	Everyday uses	Bonds
Exothermic	To the surroundings	Increase of surroundings temperature	Combustion Neutralisation	Hand warmers	More energy released, than needed for bonds to break
Endothermic	From the surroundings	Decrease of surroundings temperature	Thermal decomposition Melting and boiling	Sports injury packs Freezing and condensing	**Less** energy released, than needed for bonds to break

Key terms

activation energy **bond energy** **endothermic** **exothermic** **reaction profile** **bond making** **bond breaking**

Year 9 Science
Earth and atmosphere 2

The Earth's changing atmosphere

Period	Proportions of gases	Evidence
~ 4.6 billion years to 2.7 billion years ago	CO_2 – Released by volcanoes. Biggest component of the atmosphere. O_2 – Very little oxygen present N_2 – Released by volcanoes H_2O – Released by volcanoes. Existed as vapour -Earth too hot. Ammonia and methane may also have been present.	Very limited evidence. Comparisons made to other planets with an atmosphere rich in CO_2
~ 2.7 billion years to 200 million years ago	CO_2 – Begins to reduce. • Water condenses to form oceans, which CO_2 dissolves in. • Algae start to photosynthesise using CO_2. • CO_2 precipitates in the oceans as carbonates to form rocks • CO_2 taken in by plants and animals. Trapped as fossil fuels for millions of years O_2 – Increases due to evolving plants releasing during photosynthesis N_2 – Continues to increase through volcanic release H_2O – Decreases as the Earth cools, condensing to form seas and oceans	Still limited. Look at processes such as photo-synthesis to make theories.
~ 200 million years ago until the present day	CO_2 – about 0.04%. O_2 – about 21% N_2 – about 78% H_2O – Very little overall. Collects in clouds. A small proportion of other gases	Ice core evidence. Global measure-ments.

Pollutants

Pollutant	Origin	Effect
CO	Incomplete combustion	Colour/odourless toxic gas
Particulates	Incomplete combustion	**Global dimming**
SO_2	Sulfur impurities	**Acid rain**/respiratory issues
Nitrogen oxides	Heating of nitrogen in air	**Acid rain**/respiratory issues

Key terms

Acid rain **atmosphere** **carbon footprint** **pollutant** **climate change** **global warming** **greenhouse gas** **water**

Greenhouse effect and global warming

Greenhouse gases such as **carbon dioxide**, **methane** and **water vapour** absorb radiation from the sun and maintain the temperature on Earth. During the day, the Sun warms the earth's surface, whilst at night the earth cools and releases the heat back into the atmosphere. Some of the heat becomes trapped – this is the **Greenhouse effect**. In the last 200 years, human activities have led to an increase in the release of greenhouse gases through burning of fossil duels and deforestation.

Climate change

Global warming leads to changes in the weather patterns across the globe. This is known as global climate change. Climate change has numerous effects on the planet: Rising sea levels, changes in the amount of rainfall, polar ice caps melting and extreme weather events.

Earth's Resources

We use Earth's resources to provide us with warmth, fuel, shelter, food, and transport. These can be **natural** (timber, fuel) or **synthetic** resources made by scientists. Resources can also be categorised as **finite** or **renewable**. Finite resources such as fossil fuels will run out. Wood is a renewable resource, as trees can be grown to replace any that are cut down.

Water

Type	What is in it? How is potable water made?
Pure	Just water molecules.
Potable	Water molecules, low level of salts, safe levels of harmful microbes
Salty	Water molecules, high levels of salts, high levels of harmful microbes. **Desalination** is the process to turn salt water into potable water, either through **distillation** or **reverse osmosis**.
Fresh	Water molecules, low level of salts, often high levels of harmful microbes. To produce potable water, fresh water is passed through filters to remove larger objects before being **sterilised** to kill microbes with ozone, chlorine or UV light.

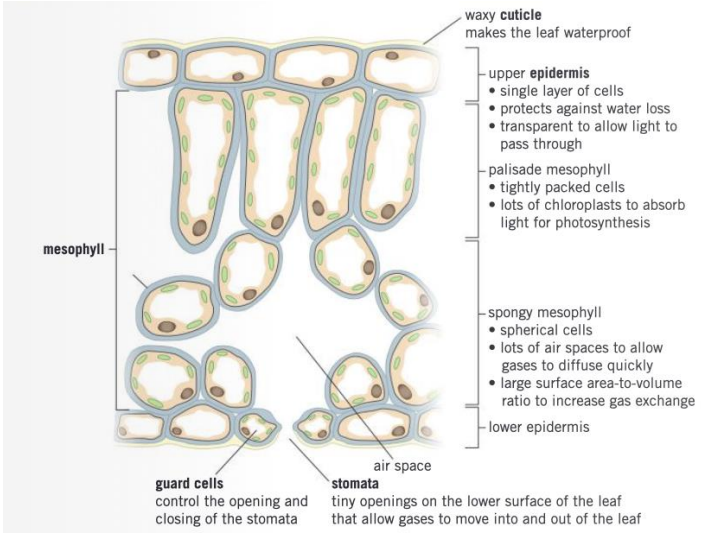
Resources

Many materials are made from **natural resources** that have **limited supplies**. When finished with a product, it can be: added to landfill, incinerated, **reused** (used again for a similar purpose) or **recycled** (conserves resources and requires less energy than creating new materials).

Year 9 Science
Photosynthesis and cellular respiration

Tissues in a leaf

Leaves are organs because they contain many tissues that work together to perform photosynthesis.



Stomata

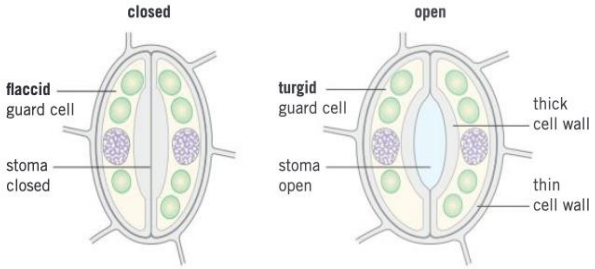
Stomata are tiny openings in the undersides of leaves – this placement reduces water loss through evaporation.

They control gas exchange and water loss from leaves by:

- Allowing diffusions of carbon dioxide into the plant for photosynthesis
- Allowing diffusion of oxygen out of the plant

Guard cells are used to open and close the stomata.

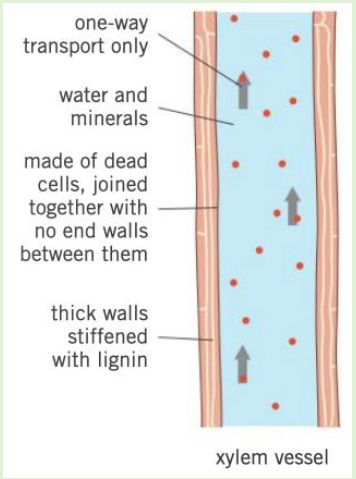
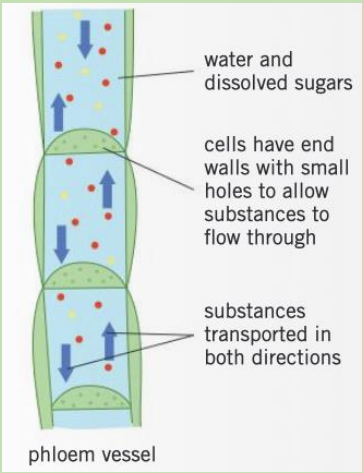
When a plant has plenty of water, the guard cells become turgid. The cell wall on the inner surface is very thick, so it cannot stretch as much as the outer surface. So as the guard cells swell up, they curve away from each other, opening the stoma.



Key terms

cuticle epidermis flaccid mesophyll stomata phloem xylem turgid translocation transpiration guard cell

Transportation in plants

	Transpiration	Translocation
Description	Water is lost through the stomata by evaporation. This pulls water up from the roots through the xylem and is called transpiration. The constant movement of water up the plant is called the transpiration stream.	The movement of dissolved sugars from the leaves to the rest of the plant through the phloem.
Importance	Provides water to cells to keep them turgid. Provides water to cells for photosynthesis Transports mineral ions to leaves.	Moves dissolved sugars made during photosynthesis to other parts of the plant. This allows for respiration, growth and glucose storage.
Specialised Tissues		

Factors affecting the rate of transpiration

Factor	Effect on transpiration	Because…
temperature	higher temperatures increase the rate of transpiration	water evaporates faster at higher temperatures
humidity	lower humidity increases the rate of transpiration	the drier the air the steeper the concentration gradient of water molecules between the air and the leaf
wind speed	more wind increases the rate of transpiration	wind removes the water vapour quickly, maintaining a steeper concentration gradient
light intensity	Higher light intensity increases the rate of transpiration	stomata open wider to let more carbo dioxide into the leaf for photosynthesis

Year 9 Science Photosynthesis and cellular respiration

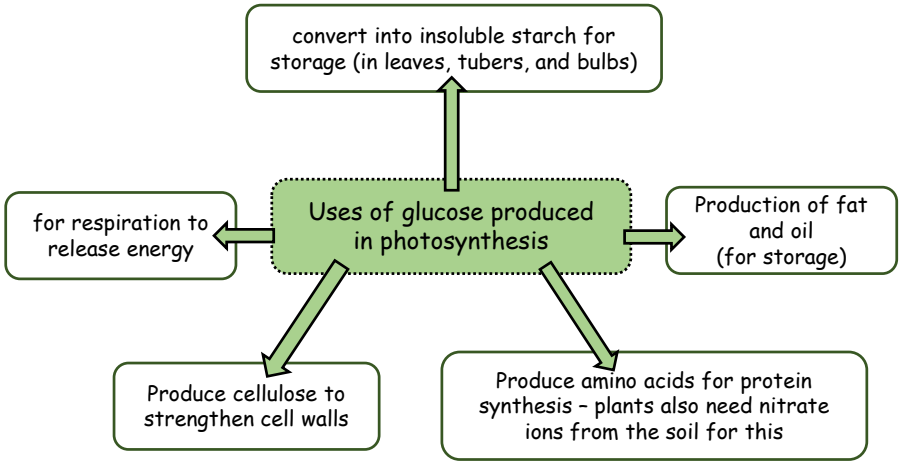
Photosynthesis reaction

Photosynthesis is a chemical reaction in which energy is transferred from the environment as light from the Sun to the leaves of a plant. This is an endothermic reaction.

Chlorophyll, the green pigment in chloroplasts in the leaves, absorbs the light energy. Leaves are well adapted to increase the rate of photosynthesis when needed.

carbon dioxide + water $\xrightarrow{\text{light}}$ **glucose** + oxygen

$6CO_2 + 6H_2O \xrightarrow{\text{light}} C_6H_{12}O_6 + 6O_2$



Inverse square law

As the distance of a light source from a plant increases, the light intensity decreases – this is called an inverse relationship. This relationship is not linear, as light intensity varies in inverse proportion to the square of the distance:

$$\text{light intensity} \propto \frac{1}{\text{distance}^2}$$

For example, if you double the distance between a light source and a plant, light intensity falls by three quarters.

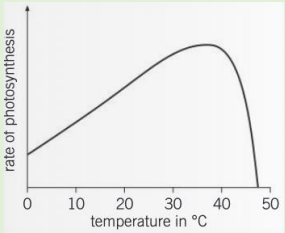
Rate of photosynthesis

A limiting factor is anything that limits the rate of a reaction when it is in short supply.

The limiting factors for photosynthesis are
- Temperature
- Carbon dioxide concentration
- Light intensity
- Amount of chlorophyll

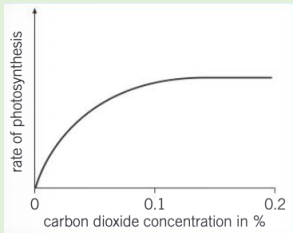
Less chlorophyll in the leaves reduces the rate of photosynthesis. More chlorophyll may be produced by plants in well-lit areas to increase the photosynthesis rate.

Limiting factors and photosynthesis rate



At low temperatures the rate of photosynthesis is low because the reactant molecules have less kinetic energy.

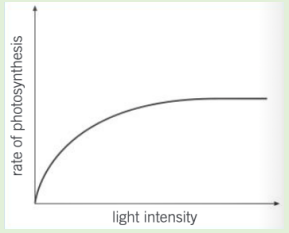
Photosynthesis is an enzyme-controlled reaction, so at high temperatures the enzymes are denatured and the rate quickly decreases.



Carbon dioxide is used up in photosynthesis, so increasing carbon dioxide concentration increases the rate of photosynthesis.

At a certain point, another factor becomes limiting.

Carbon dioxide is often the limiting factor for photosynthesis.



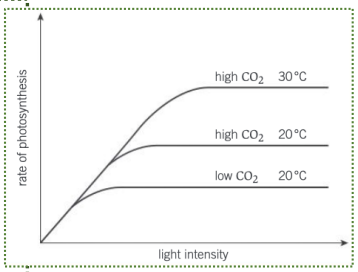
Light energy is needed for photosynthesis, so increasing light intensity increases the rate of photosynthesis.

At a certain point, another factor becomes limiting.

Photosynthesis will stop if there is little or no light.

Interaction of limiting factors

Limiting factors often interact, and any one may be limiting photosynthesis.
For example, on the graph the lowest curve has both carbon dioxide and temperature limiting photosynthesis. Temperature is limiting for the middle curve, and the highest curve shows photosynthesis rate increases when both temperature and carbon dioxide are increased until another factor becomes limiting.



Greenhouse economics

Commercial greenhouses control limiting factors to get the highest possible rates of photosynthesis so they can grow plants as quickly as possible or produce the highest yields, whilst making a profit.

Key terms

carbon dioxide | chlorophyll | chloroplast | endothermic | glucose | inverse square law | limiting factor | photosynthesis

Science Year 9
Investigating Photosynthesis

Aim

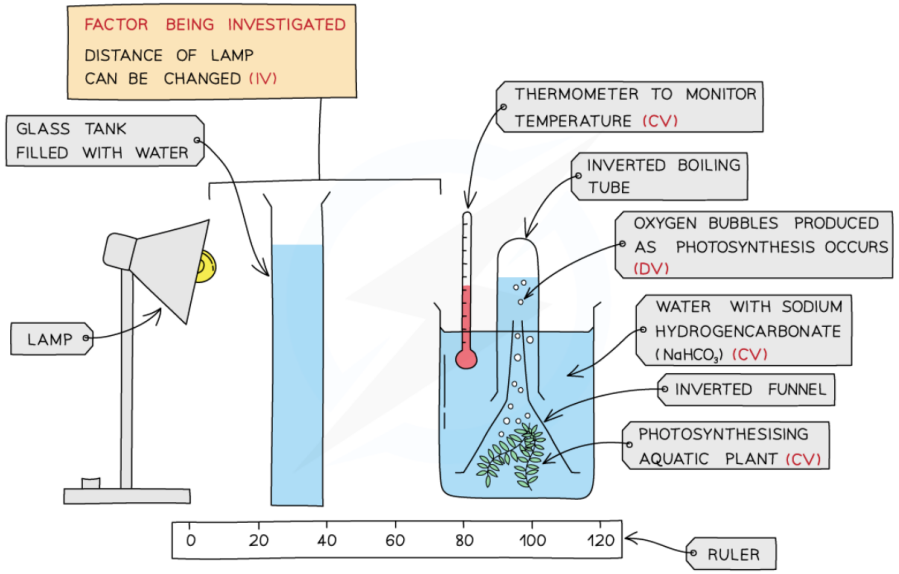
Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed

Variables

Dependent – The number of bubbles / volume of oxygen produced
Independent – Distance between light source and plant / light intensity.
Control – Temperature (can be controlled using and LED bulb or a heat shield, carbon dioxide concentration, type of plant, length of plant, mass of plant.

Method

Place a piece of pondweed (Elodea or Cabomba are often used), into a beaker of water
Use a light a set distance from the plant
Record the number of bubbles observed in three minutes
Repeat steps for different distances



Improvements

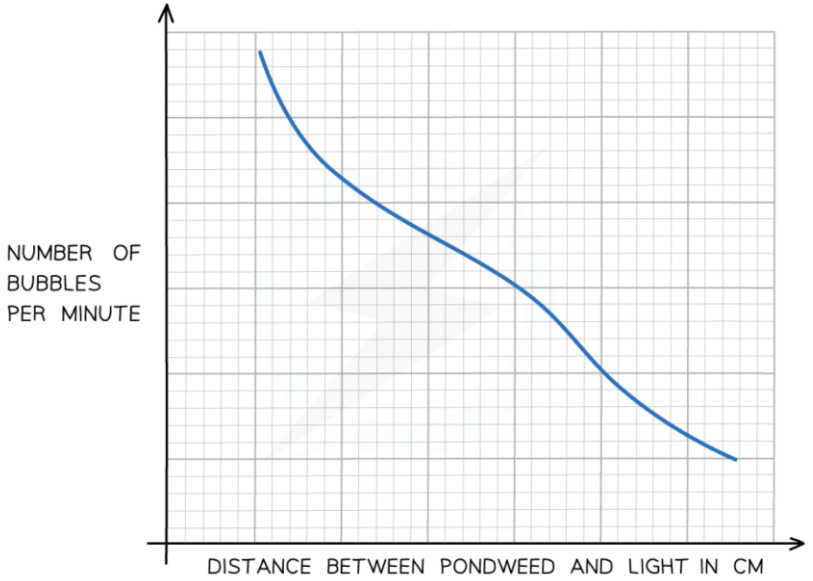
- Use a gas syringe to collect the volume of gas produced
- Repeat the experiment at least twice for each distance and calculate the mean number of bubbles
- Use of a glass tank between lamp and plant to prevent heating of the plant, or using an LED bulb that releases very little heat energy

Changing the Independent Variable

- To investigate the impact of carbon dioxide concentration the concentration of sodium hydrogen carbonate can be changed.
- Use different temperatures of sodium hydrogen carbonate solution.

Results

- As the distance between the plant and light source increases the number of bubbles decreases. This shows that the rate of photosynthesis decreases at lower light intensities.



Key terms

carbon dioxide | chlorophyll | chloroplast | endothermic | glucose | inverse square law | limiting factor | photosynthesis

Science – Year 9
Cellular Respiration

Cellular respiration

Cellular respiration is an exothermic reaction that occurs continuously in the mitochondria of living cells to supply the cells with energy.

The energy released during respiration is needed for all living processes, including

- chemical reactions to build larger molecules, for example, making proteins from amino acids
- muscle contraction for movement
- keeping warm

Respiration in cells can take place aerobically (using oxygen) or anaerobically (without oxygen).

Type of respiration	Oxygen required?	Relative amount of energy transferred
aerobic	✔	Complete **oxidation** of glucose – large amount of energy is released
anaerobic	✘	Incomplete oxidation of glucose – much less energy is released per glucose molecule than in aerobic respiration

Aerobic respiration

glucose + oxygen → carbon dioxide + water

$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

Anaerobic respiration in muscles

glucose → lactic acid

$C_6H_{12}O_6 \rightarrow 2C_3H_6O_3$

Fermentation

Anaerobic respiration in plant and yeast cells is represented by the equation:

glucose → ethanol + carbon dioxide (energy transferred to the environment)

Anaerobic respiration in yeast cells is called fermentation.

The products of fermentation are important in the manufacturing of bread and alcoholic drinks.

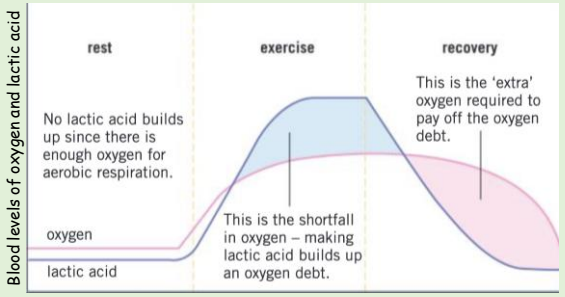
Response to exercise

During exercise the human body reacts to the increased demand for energy.

To supply the muscles with more oxygenated blood, heart rate, breathing rate, and breath volume all increase.

If insufficient oxygen is supplied, anaerobic respiration takes place instead, leading to the build up of lactic acid.

During long periods of vigorous exercise, muscles become fatigued and stop contracting efficiently.



After exercise, the lactic acid accumulated during anaerobic respiration needs to be removed. Oxygen debt is the amount of oxygen needed to react with the lactic acid to remove it from cells.

Removal of lactic acid

Lactic acid in the muscles

⇩

Transported to the liver in the blood

⇩

Lactic acid is converted back to glucose

Key terms

aerobic anaerobic exothermic fermentation lactic acid metabolism mitochondria oxidation oxygen debt respiration

Year 9 Science
Relationships in an Ecosystem

Feeding relationships within a community can be represented by food chains.

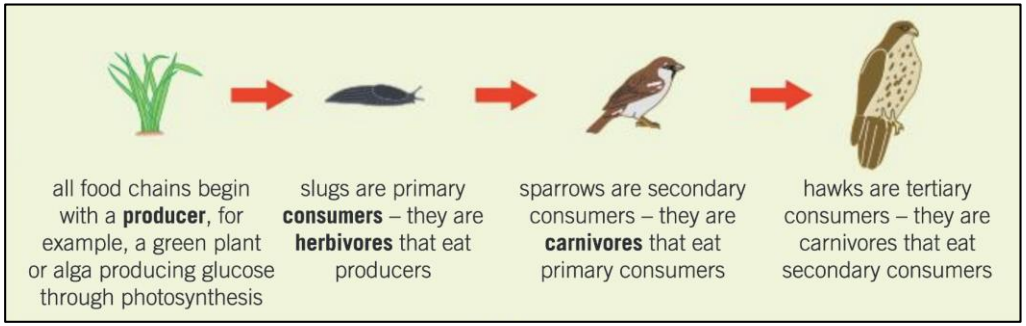
Photosynthetic organisms that synthesise molecules are the producers of all biomass for life on Earth, and so are the first step in all food chains.

A range of experimental methods using transects and quadrats are used by ecologists to determine the distributions and abundance of different species in an ecosystem.

Consumers that kill and eat other animals are predators, and those that are eaten are prey.

Apex predators are carnivores with no predators.

Organisms usually have more complex feeding relationships, with more than one predator or more than one source. These can be shown in a food web.



all food chains begin with a **producer**, for example, a green plant or alga producing glucose through photosynthesis

slugs are primary **consumers** – they are **herbivores** that eat producers

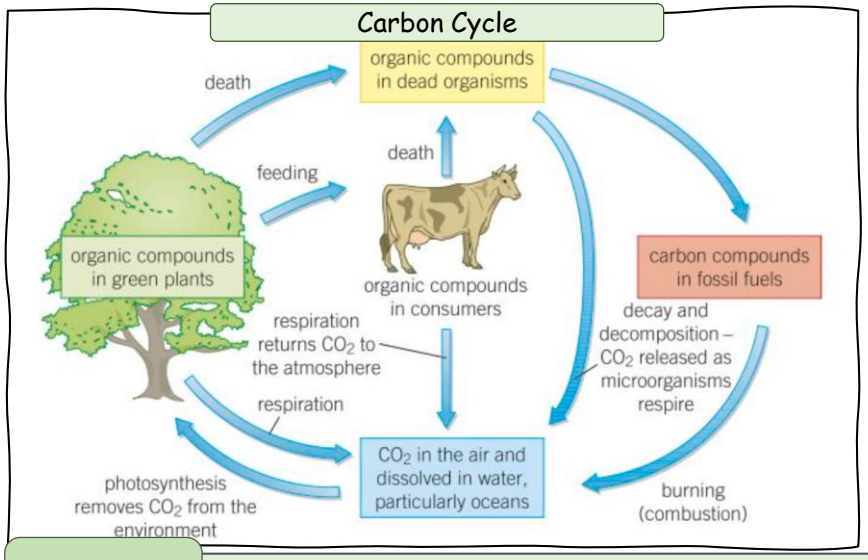
sparrows are secondary consumers – they are **carnivores** that eat primary consumers

hawks are tertiary consumers – they are carnivores that eat secondary consumers

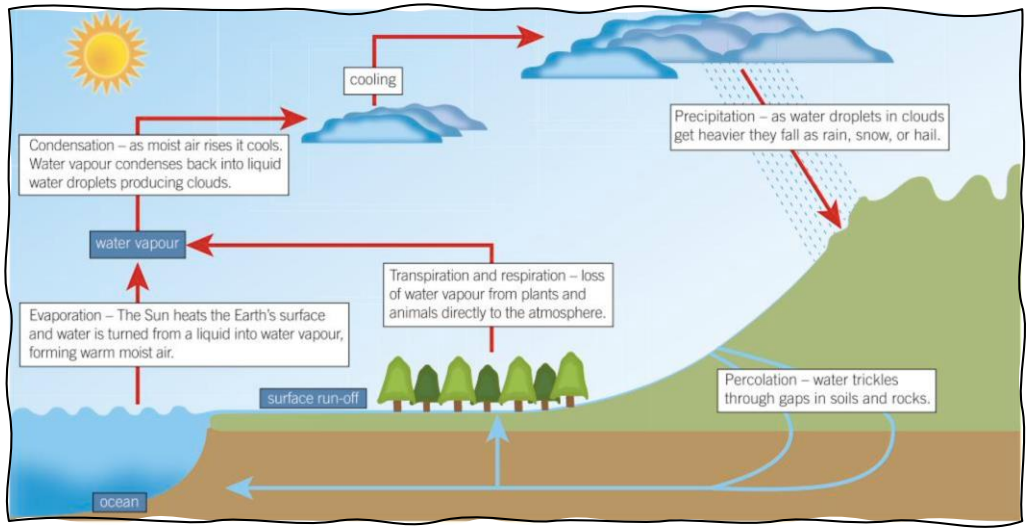
How materials are recycled

All materials in the living world are recycled, which provides the building materials for future organisms.

Carbon Cycle



Water Cycle



Key terms

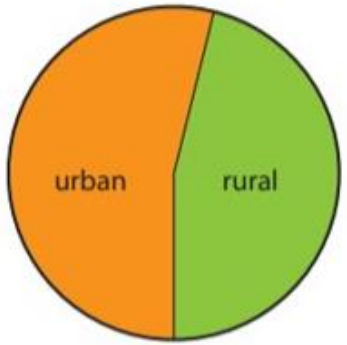
biodiversity carbon cycle carnivore consumer deforestation evaporation food chain food web herbivore precipitation predator prey producer water cycle

Year 9 Topic 5 Geography
Urban Contemporary Issues

Make sure you know the 'bare bones' of this unit.

Urban – A densely populated built up area, for example, a town or city
Rural – A sparsely populated area, for example, the countryside
Urbanisation – An increasing percentage of a country's population living in a town or city
Megacity – A city with a population of more than 10 million people
Push factor – A reason why a person is forced away from an area, for example, poverty
Pull factor – A reason why a person is attracted to an area, for example, employment
Social Inequality – The extent to which there are differences between groups in society, related to things such as gender and income.
Deprivation – The damaging lack of material benefits considered to be basic necessities in society
Poverty – Where people struggle to meet daily needs through their income and therefore struggle to participate in society
Brownfield site – Previously sites of industry that have been abandoned and left derelict
Greenfield site - Previously undeveloped sites found on the edge of cities (urban-rural fringe
Energy mix – The range of energy sources of a region or country, both renewable and non-renewable
Landfill site – The disposal of waste material by burying it in the ground
Regeneration – The action or process of regenerating and improving an area

Rates of urbanisation across the world



Since the industrial revolution, urban areas have grown, as people were attracted to find work, usually in factors. During that period, people were forced to move from rural areas due to poverty or lack of work (push factors) and attracted to live in urban centres due to advantages of better healthcare and job prospects (pull factors)

Today, about 54% of humans live in urban areas. By 2050, this figure is likely to be 70%.

Europe and North America were the first continents to have high rates of urbanisation. Asia and Africa have the current highest rates of urbanisation.

Social Inequality

There are a number of strategies in place to help reduce inequality, but social inequality is a huge challenge both nationally and globally.

Income inequality in the UK has risen in the UK faster than any other developed nation. In 2021, the richest 10% of people received 50% more income than the poorest 40%. This has a huge impact on relative poverty.

Income inequality impacts on factors such as health (not everyone will live to the same age, or enjoy a healthy lifestyle), gender (on average, women live years longer than men) and ethnic group.

UK Housing Crisis

Demand for good quality and affordable housing is rising in the UK. This is due to an increasing population, people living longer and social factors, such as people choosing to marry later.

However, the UK has a housing crisis because there are not enough homes and people can't afford the homes they would like to live in.

Houses are becoming increasingly unaffordable to people on low incomes because of rising house prices, spiralling interest rates for mortgages, high private sector rents, and inadequate levels of social housing. This means people are spending a higher amount of their income on housing and less on other basic needs.

Until the 1970s, high rise flats were a common way to home a growing population in a small, inner city area (for example, The Byker Wall). Increasingly, however, high rise flats have been linked with a lack of community and high crime rates.

As more housing is needed, the urban-rural fringe is becoming less distinct.

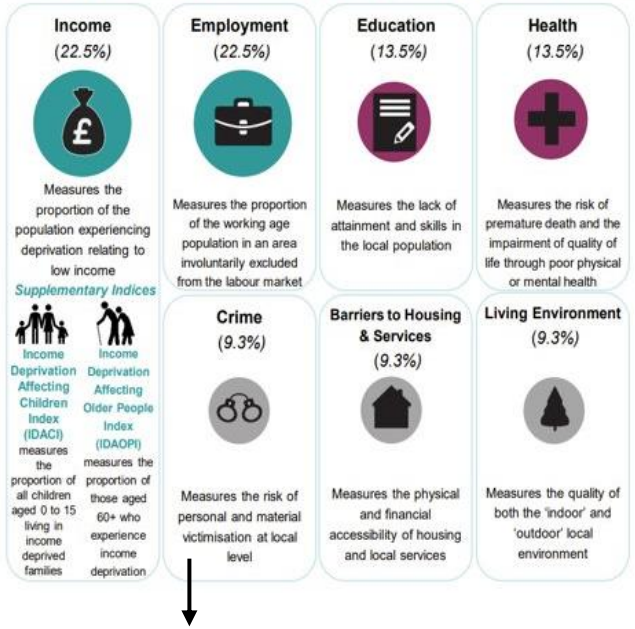
However there is great controversy about building in these greenfield sites since the environment is changed from open space to urban, affecting biodiversity. Some argue inner city brownfield sites should be developed instead.

What is urban deprivation?

Urban deprivation is defined as a standard of living below that of the majority in a particular society that involves hardship and lack of access to resources.

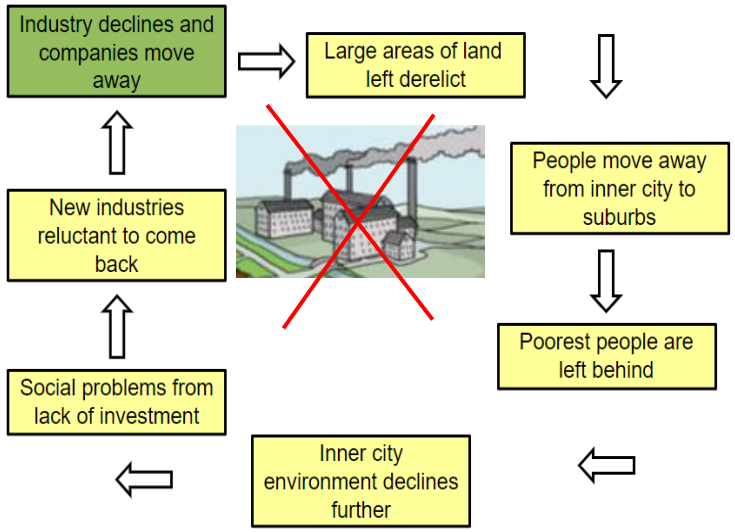
All the factors that make up quality of life (for example, income, education, levels of crime and health) can be put into an index to show areas that are more deprived than others. This is called The Index of Multiple Deprivation.

There are 7 domains of deprivation, which combine to create the Index of Multiple Deprivation (IMD2019):



An area of multiple deprivation is likely to have a crime rate. **Urban crime** is likely to happen when an area lacks resources and investment, therefore provides the opportunity for crime. The police use GIS (Geographical Information Systems) to map patterns and resulting crime hot spots.

What is the cause of urban deprivation?

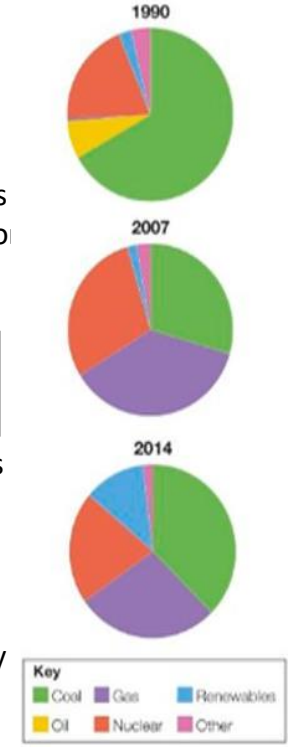


Urban energy

Household energy use has reduced due to homes becoming more energy efficient and people becoming more aware of the environmental costs. However, energy is used increasingly in urban places for transport, to heat homes for a growing populatio and to provide fuel for industries, such as those which make food and clothes.

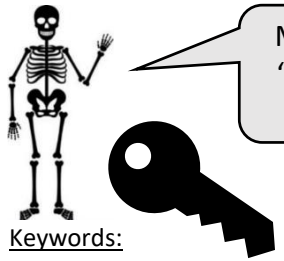
Fact: Urban areas currently consume around 75% of global primary energy supply, and this is expected to grow

The UK imports most of its energy, and mainly relies on fossil fuels, that are non-renewable, and in thousands of years will run out before being replaced. The UK is investing in renewable energy (including wind, solar and hydro-electricity) and in 2014, this made up a larger share of the UK's energy mix



Urban challenges	Urban solutions
Waste: In HICs like the UK, waste is a growing problem. Items are being replaced often (such as mobile phones and computers) rather than re-used. **Landfill sites** are the most common and oldest form of waste disposal – over 50% of all household waste ends up in the ground; however, waste can take years to decompose, this is not good for the environment, producing greenhouse gases, contaminating soils/water and harming health.	**Waste:** Landfill space is limited and will run out, so it is important to invest in: • Reducing the amount of waste produced • Re-using items rather than replacing them • Recycling raw materials create new products Often recycled goods ends up in landfill because of incorrect labelling or sorting; this is an area for urgent improvement
Traffic: Urban areas have the worst air quality due to high amounts of industry and traffic. In particular, traffic congestion contributes to air pollution due to an increase in the number of cars on the road and the growing number of people who commute to work in city areas, without using public transport. Air pollution causes severe health challenges for people who live in built up areas.	**Traffic:** Traffic management schemes have been introduced including: • Park and ride schemes, • Car pooling • Cycling and Bus lanes • Congestion charges • Traffic Calming

Y9 Sustainable World



Make sure you know the 'bare bones' (the basics) of this unit.

Keywords:

- Sustainable development - is **the ability to provide for current generations without compromising the ability of future generations to meet their own needs**.
- Sustainable Development Goals - **aim to transform our world**. They are a call to action to end poverty and inequality, protect the planet, and ensure that all people enjoy health, justice and prosperity.
- Poverty - the state of being extremely poor.
- Inequality - **the idea that different people experience different standards of living**.
- Sanitation - the promotion of hygiene and prevention of disease by maintenance of sanitary conditions (as by removal of sewage and rubbish).
- Food Miles - a mile over which a food item is transported during the journey from producer to consumer, as a unit of measurement of the fuel used to transport it.
- Carbon Footprint - the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community.
- Sustainable tourism involves **taking into account any probable or possible impacts of tourism on the present and future social, environmental and economic structure of a place**

"Sustainability is meeting the needs of the present without compromising the ability of future generations to meet their own needs." The Brundtland Report 1987

Sustainable Development Goals

SUSTAINABLE DEVELOPMENT GOALS

What: The Sustainable Development Goals are 17 unique goals set out by UN member states to help tackle some of the biggest causes of POVERTY, INJUSTICE and DAMAGE to our planet. Their predecessors were the Millennium Development Goals established in 2000.

When: The Sustainable Development Goals were established in 2015 and will run up to 2030

Who: The SDGs are designed with both developing and developed countries in mind and are to be seen as universal goals to be achieved worldwide

Why:
- **795 MILLION** hungry
- More than **1 BILLION** people live on a dollar a day
- **1.3 BILLION** tons of food are wasted every year
- **375 MILLION** people are affected by climate change related disasters every year

Why does the UK Import food?

= cheaper to import because **poor harvests** and **cost of animal feed** makes UK food **expensive**

= UK **climate is unsuitable** for growing foods such as cocoa, tea and bananas

= supermarkets are **big and able to stock** a wide range of foods

= **demand** for **greater choice** and **variety** of food

= demand for **seasonal food all year round**, e.g. strawberries in winter

Sustainable food principles

1.Eating local and seasonal food reduces the miles which food has to travel.

2. Farm organically – low carbon farming, less use of fertilisers/pesticides.

3. Reduce waste packaging

4. Eat less meats/dairy to reduce greenhouse gas emissions.

5. Eat less at-risk fish – reduce overfishing by eating a wider range of fish.

6. Fair trade – ensuring all workers within food production are treated the same with a fair price for goods.

7. Promote health and wellbeing – encourage healthy eating, aiming to reduce the amount of food we waste.

8. Make system more democratic – local famers and communities receiving fair prices not having to compete with cheap prices from supermarkets.

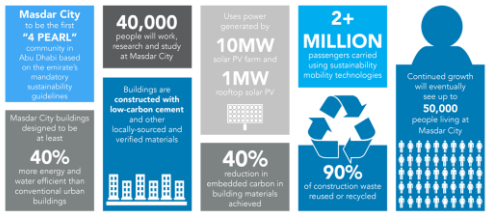
Example of sustainable City: **Masdar City,**

Masdar City is located in Abu Dabi within the United Arab Emirates, Asia.

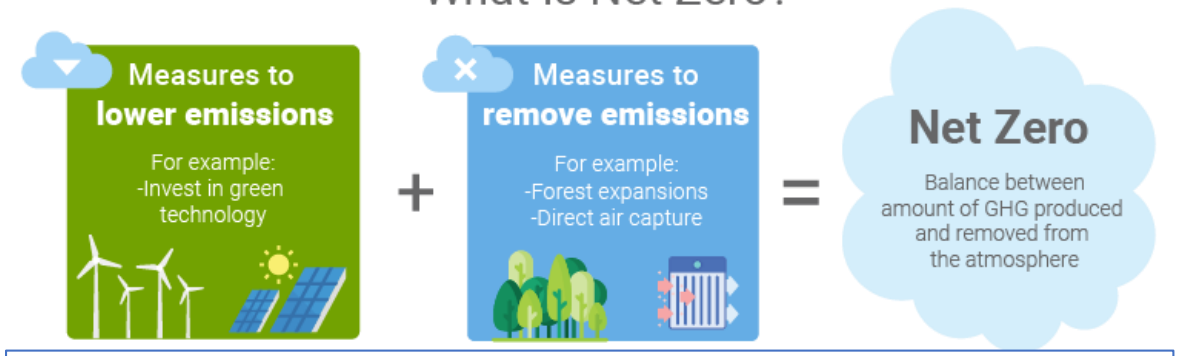
It is located next to Abu Dabi airport.
It has many features in place to achieve sustainability, some of the ***successes include:***
- Everything in walking distance.
- The entire community is powered by a 54 acre field of 87,777 solar panels with more on the roofs of the buildings
- For the most part, cars have been replaced by a series of driverless electric vehicles
- design of the walls of the buildings (cushions of air limit heat-radiation) has helped reduce demand for air conditioning by 55 percent
.- A wind tunnel allows the city to be a low as 20 degrees Celsius.
However, there has been failures -

- There is a bike-sharing station – though it's a good 10 miles away from Abu Dhabi, and there are no bike paths.
- Masdar City is nowhere close to zeroing out its greenhouse gas emissions now, even at a fraction of its planned footprint

- The UAE uses its own ratings system which does not readily translate to

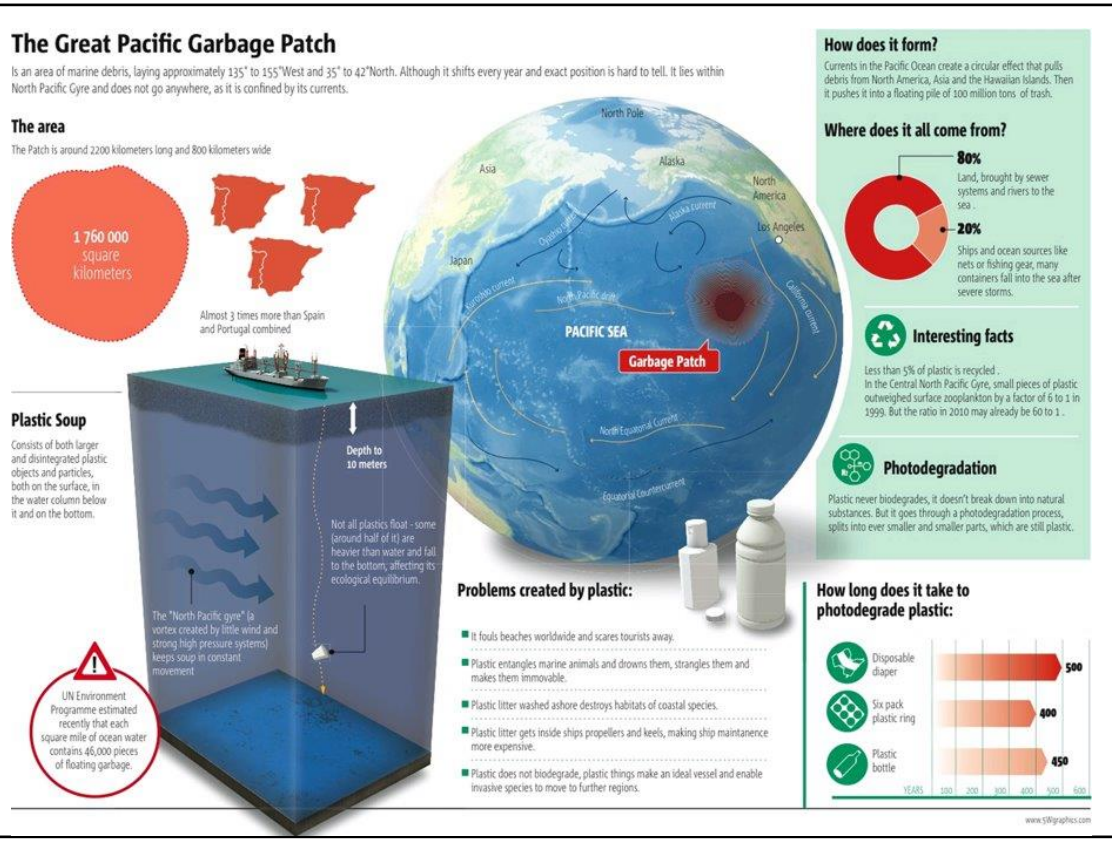


What Is Net Zero?



What has the UK put in place to achieve Net Zero?
- Climate change Act – The Uk will achieve Net Zero by 2050, to help gain this -

- Emission Trading Scheme, which replaces the EU scheme following the UK's departure from the EU. The scheme is mandatory for energy-intensive industries. They are given permits to emit greenhouse gases and can trade them at the market rate. It is intended to incentivise industries to lower emissions and save money.
- Fuel duty tax on the road fuel burnt by UK car drivers.
- Contracts for Difference guarantee a fixed price per unit of low-carbon power generation for large-scale power operations.
- Energy Company Obligation, on large energy firms in Britain, requires companies to boost the efficiency of homes, with the costs passed to consumers via energy bills.
- Climate Change Levy (CCL) is paid by polluters in the business sector on every unit of energy consumed. CCLs can be opted out of if the user agrees to a Climate Change Agreement to boost their efficiency.



Plastic Pollution

Causes	Impacts	Solutions
• 300 million tonnes of plastic waste gets produced each year. • Too much single use plastic • 70% of plastic debris sinks into the oceans. • 79% of plastic ends up in landfill sites.	• 100 million marine life die each year due to plastic waste. • 5.25 trillion pieces of plastic waste estimated to be within our oceans. • 90% of worldwide debris comes from 10 rivers alone. • Largest trash site @The Great Pacific Garbage Patch' is the side of Texas.	• Recycle • Boycott single use plastics • Use reusable carrier bags • Shop local and buy package free objects. • Educate people about the harm which is being done to the oceans. • Carry out rubbish collections at our beaches.

Tataquara Lodge

Location
Tataquara Lodge is on an island in the Xingu River in the Brazilian State of Para.
It is owned and operated by a cooperation of six local tribes of indigenous people.
The lodge has 15 rooms and offers activities such as fishing, canoeing, wildlife viewing and forest walks.
The surrounding forest is home to a variety of wildlife including species of bats and tropical birds.

Environmental benefits
The lodge was built from local materials such as straw and wood that was found on lying on the ground in the local area. This means they did not have to cut down any new trees to build the lodge.
It uses solar power to run lights, rather than burning fossil fuels to generate electricity which is better for the environment.
The food served in the lodge is all locally produced. This means that the food has not had to travel far, thereby reducing food miles.

Economic benefits
As the lodge is owned by local tribes, any profit it makes goes to them rather than to a big foreign company.
The surrounding area supplies the lodge with local food and produce, which further puts money back into the local economy.

Benefits for local people
The lodge creates and provides jobs for the local population.
Local people can make and sell crafts such as jewellery, and also perform traditional dances and songs. This gives them money and helps to preserve their culture.
Any extra money made from the lodge is invested in providing healthcare and an education for local people.

Sustainability
The lodge is sustainable because everything it does is aimed at improving the quality of life for the people who live in the area.
It also means that the tribes people will stop looking for other ways to make money that might damage the environment, e.g. logging and farming. The ecolodge will also remain in place for generations to come, making it sustainable in the long run.

BIG QUESTIONS – Y9 – P4L

Does punishment deter crime?

Types of punishment: Prison, community service, fines, tagging, suspended sentences etc.

Capital punishment - Execution as a punishment for a person who has committed a crime.

FOR	AGAINST
- Acts as a deterrent - Society can be free of its most dangerous people - The **Bible** sets down the death penalty for some crimes, so it must be acceptable to God, 'Eye for eye, and tooth for tooth.'	- It is a cruel, inhumane, and degrading punishment - There have been many occasions of innocent people wrongfully executed - One of the Ten Commandments is "thou shalt not kill"

Should euthanasia be permitted?

Euthanasia - The painless killing of someone dying from a painful disease.
Assisted Suicide - Providing a seriously ill person with the means to commit suicide.

- Euthanasia is illegal in the UK.

FOR	AGAINST
- We should be able to choose how we die - Lessens pain for the patient, people should not have to live if they have no chance of getting better - It stops the suffering of relatives watching the patient die a slow and painful death	- It is unnecessary when there are painkilling drugs - The dying patient might not be able to think properly when deciding that he/she wants to die quickly - Places called hospices now look after the terminally ill. These places allow people to die peacefully and without pain.

Is abortion morally wrong?

Abortion - The medical process of ending a pregnancy so it doesn't result in the birth of a baby.
It's also sometimes known as a termination.

The law: Abortions can be carried out until 24 weeks. They can only be carried out after 24 weeks for medical reasons.

Pro-Choice (choice of woman)	Pro-Life (rights of the foetus)
- Women should have the right to choose what happens to their bodies - The mother's health or life is at risk - Tests reveal an abnormality of the foetus	- No one has the right to take human a life - The foetus is a potential human being - Many couples would adopt if babies were available

Religious arguments abortion and euthanasia

FOR	AGAINST
- May be the most loving thing to do - Jesus told Christians to love their neighbour	- Sanctity of life (life is holy and belongs to God; only God has the right to end a pregnancy) - The 10 commandments – You shall not kill

Is marriage important?

Marriage - The legal union between a man and woman
Cohabitation - Living together without with married

What is the purpose of marriage?
Procreation- men & women were created to have children.
Union- marriage enables a lifelong faithful relationship
Rearing children- channel for love & compassion
Gift from God - 'till death do us part'

Pros of marriage – increased level of security, may contribute to a stable family
Cons of marriage – you limit your level of freedom, could end up in divorce

Forced marriage - either one or both of the people getting married are being coerced into the marriage. They do not give their full consent to be getting married.
Arranged marriage - when the family of the person getting married take responsibility for finding a suitable match. Both people in an arranged marriage have to consent to the marriage and are given the right to refuse the match.

Is social media bad for you?

Social media is computer-based sharing of information via networks.
Digital footprint is the trail of data created when we use the internet.

Positives of social media	Negatives of social media
- Boosting self-confidence - Creating a positive Digital Footprint - Ability to make new friends	- Decreases face to face communication - Posts cannot always be deleted - Addiction - Cyberbullying

Skills and Techniques:

- **Actions** (eg travel, turn, elevation, gesture, stillness, use of different body parts, floor work, transfer of weight)
- **Dynamics** (eg fast/slow, sudden/sustained, strong/light, flowing/abrupt)
- **Space** (eg pathways, levels, directions, size of movement, patterns, spatial design)
- **Relationships** - eg lead and follow, mirroring, action and reaction,, complement and contrast, formations)
- **Timing**
- **Rhythm**

Choreographic devices

- Motif and development
- Repetition
- Contrast
- Highlights
- Climax
- Changes in numbers of dancers
- Unison and canon.

Positions and groupings:

Solo
Duet
Trio
Group

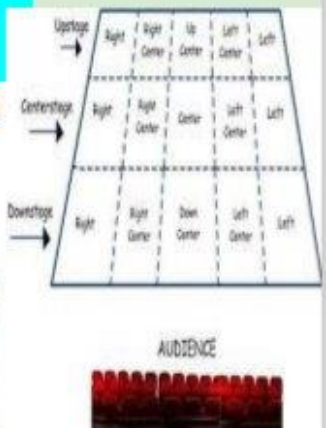
Centre stage
Upstage
Downstage
Stage Left
Stage Right
Onstage
Offstage

Performance skills

- Posture
- Alignment
- Balance
- Coordination
- Control
- Flexibility
- Mobility
- Strength
- Stamina
- Extension

Key Words:

Choreography
Pathways
Direction
Level
Speed
Extension
Timing
Phrase
Stimulus



Influential Choreographers

Bob Fosse David Bintley Merce Cunningham
Rosie Kay Matthew Bourne

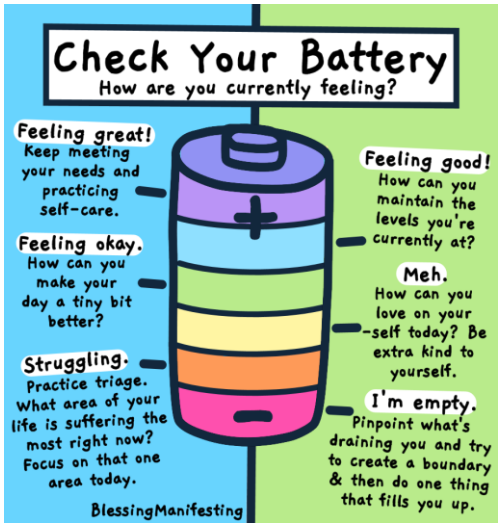
Challenge: What can you find about these people?

Year 9
Dance
Choreographic Devices

Mental Wellbeing and health prevention – Y9 – P4L

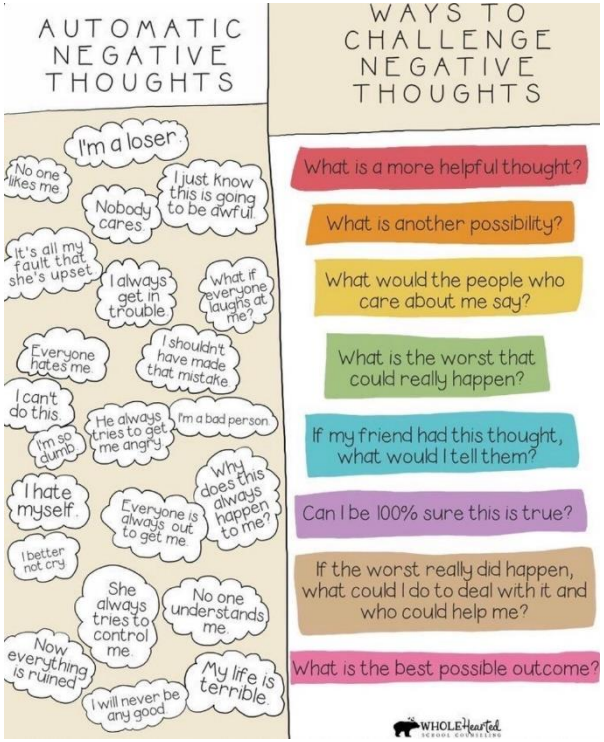
What is mental wellbeing?
- We might use it to talk about how we feel, how well we're coping with daily life or what feels possible at the moment.
- Good mental wellbeing doesn't mean you're always happy or unaffected by your experiences. - But poor mental wellbeing can make it more difficult to cope with daily life.

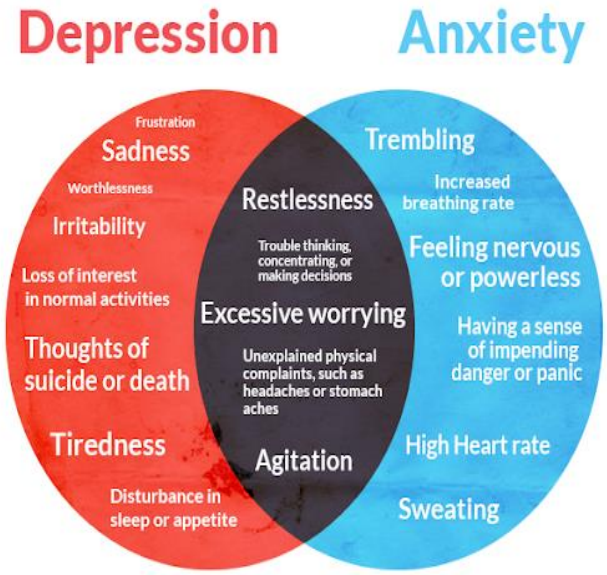
- **Resilience** is the process of adapting when you are faced with trauma, stress or any kind of adversity or emotional suffering.
- Someone who is resilient faces tough life situations head-on, experiencing the difficult times and emotions.



Mindfulness involves noticing what's happening in the present moment. You might be aware of your mind, body or surroundings. Mindfulness aims to help you to feel calmer and less stressed.

SUPPORT
Young Minds www.youngminds.org.uk
Childline - www.childline.org.uk
Samaritans - www.samaritans.org





Is mental health as important as physical health?
- Mental and physical health are equally important.
- The presence of physical conditions can increase the risk for mental illness. For example, if you have a chronic illness you may not be able to leave the house.
- Mental health problems can cause your physical health to deteriorate. For example: if you have chronic anxiety and depression, you may have trouble sleeping, thus, putting your physical health at risk.

Is mental health as important as physical health?
Vaccines - have saved millions of lives as they protect people against harmful diseases.

Blood donation – Blood or the components of blood are used to treat patients with medical conditions, such as anaemia, cancer and blood disorders, as well as those having surgery.

Organ Donation - when you decide to give an organ to save or transform the life of someone else.

Donating stem cells - replaces damaged blood cells with healthy ones. It can be used to treat conditions affecting the blood cells, such as leukaemia.

Cancer Awareness
Breast cancers: https://coppafeel.org
Cervical cancer: https://www.jostrust.org.uk
Cervical screens (smear tests): https://www.cancerresearchuk.org/about-cancer/cervical-cancer/getting-diagnosed/screening/about
Testicular cancer: https://www.teenagecancertrust.org/information-about-cancer/testicular-cancer
Skin cancer: https://www.teenagecancertrust.org/information-about-cancer/skin-cancer

KEY WORDS:

AED: automated external defibrillator, is used to help those experiencing sudden cardiac arrest

Anxiety: is what we feel when we are worried, tense or afraid – particularly about things that are about to happen, or which we think could happen in the future

CPR: stands for cardiopulmonary resuscitation. It is an emergency lifesaving procedure that is done when someone's breathing or heartbeat has stopped

Depression: is a low mood that lasts for a long time, and affects your everyday life

First Aid: help given to a sick or injured person until full medical treatment is available

Panic attacks: are a type of fear response. They're an exaggeration of your body's normal response to danger, stress or excitement

Resilience: being able to cope with difficult life events and bounce back afterwards

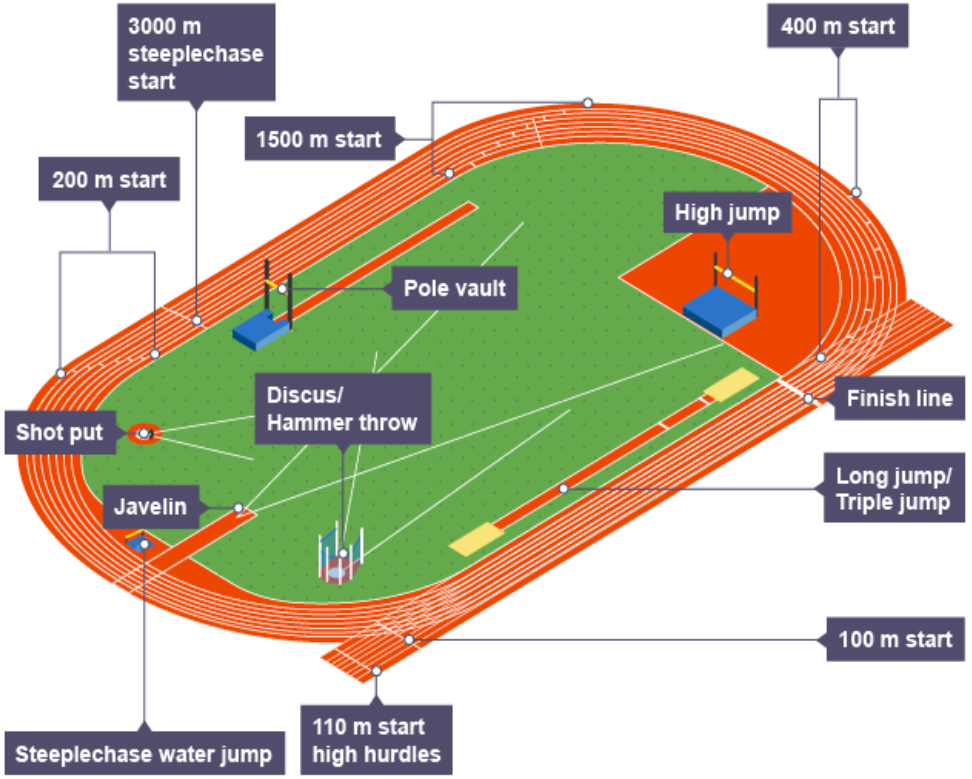
Stress: is how we react when we feel under pressure or threatened. It usually happens when we are in a situation that we don't feel we can manage or control

Y7 Subject Knowledge Organiser
Athletics – Competition, Scoring & Officials

Competition

Athletics is a collection of sporting events that consist of the three major areas of running, jumping and throwing. The running events include sprints, middle and long-distance events and hurdling. Jumping events include the long jump, high jump, triple jump and pole vault, while the throwing events include the discus throw, hammer throw, javelin throw and shot put. There are also combined events, such as the decathlon for men, which consists of ten events, and the heptathlon for women, which consists of seven events.

Shown below is a typical competition area for athletics.



Scoring

Success in athletics is judged on times and distances rather than points or goals.

Track events – These races are started with an electronic pistol which is only sounded again on a false start. In races that are very close, officials use a digital line-scan camera across the finish line to give them a photo finish picture. The clock stops when an athlete has passed through the finish line.

Jumping events – These events are measured from the front edge of the take-off board to the first mark made in the sand by the athlete. The distance is always measured to the nearest centimetre and athletes will always be given a minimum of three jumps.

Throwing events – These events are measured from the front edge of the throwing line to the first mark made in the ground by the implement. The distance is always measured to the nearest centimetre and athletes will always be given a minimum of three attempts.

Officials

An athletics competition requires a wide range of officials. These include:

Starter – Starts all track events.

Starter's marshals – Line up competitors in correct order ready for starting.

Timekeepers – Provide official times for all track competitors.

Place judges – Ensure the correct order of positions are given.

Field event judges – Measure, record and let athletes know when it is safe to compete.

Relay judges – Make sure runners at change-overs are in the correct lane and within the change-over box.

Sketchup Tools

Select Tool
Shift = Toggle
Ctrl = Add
Shift+Ctrl = Subtract
Right to Left = Crossing Selection
Left to Right = Window Selection

Move Tool
Shift = Inference Lock
Ctrl = Copy
Alt = Auto-Fold
VCB: Number = Distance

Paint Bucket Tool
Shift = Matching
Ctrl = Connected
Shift+Ctrl = Object
Alt = Sample Paint

Push/Pull Tool
Double-Click = Repeat
Ctrl = New Face
VCB: Distance

Eraser Tool
Shift = Hide
Ctrl = Soften/Smooth
Shift+Ctrl = Unsoften/Unsmooth

Rotate Tool
Ctrl = Copy
VCB: Number = Angle
VCB: Rise:Run = Slope

Rectangle Tool
VCB: Length, Width

Follow Me Tool
Alt = Use Parameter of Surface as Path

Line Tool
Shift = Inference Lock
VCB: Number = Length

Scale Tool
Shift = Toggle Uniform
Ctrl = About Center
VCB: Number = Scale Factor
VCB: Number w/ units = Length

Circle Tool
VCB: Number+**s** = Segments
VCB: Number+**r** = Radius

Offset Tool
VCB: Number = Length
Double-Click: Repeate

Arc Tool
VCB: Number = Bulge
VCB: Number+**s** = Segments
VCB: Number+**r** = Radius

Orbit Tool
Shift = Pan
Ctrl = Free

Polygon Tool
VCB: Number+**s** = Segments
VCB: Number+**r** = Radius

Pan Tool

Freehand Tool
Shift = Draw 3D Polyline

Zoom Tool
Shift = Change Field of View
VCB: Number = View Angle
VCB: Number in **mm** = Focal Length

Tape Measure Tool
Ctrl = Measure Only
VCB: Number = Resize Model

Zoom Window Tool

Dimension Tool

Zoom Extents Tool

Text Tool

Previous

Protractor Tool
Shift = Measure Only
VCB: Number = Angle
VCB: Rise:Run = Slope

Walk Tool
Shift = Move Vertically
Ctrl = Run
Alt = Walk Through Entities
VCB: Number = Eye Height

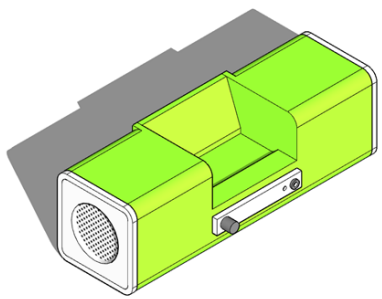
Section Tool

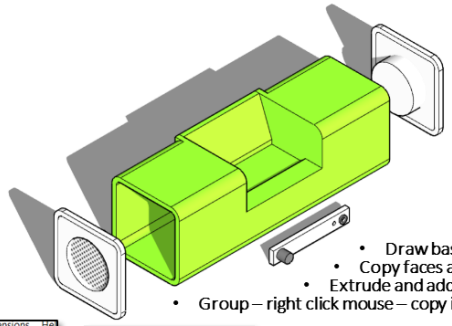
Look Around Tool
VCB: Number = Eye Height

Axes Tool

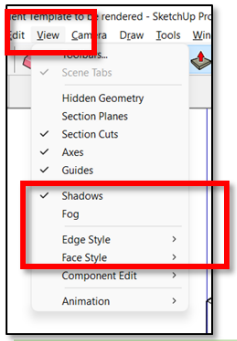
Position Camera Tool

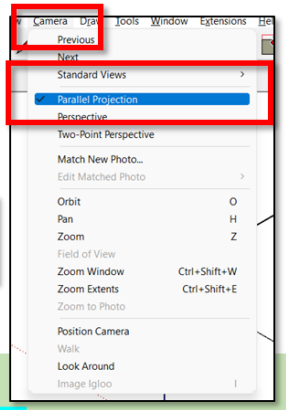
Sketchup Rendering Settings

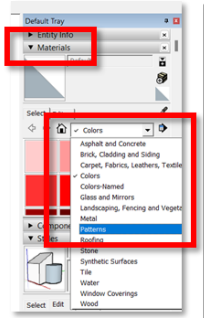


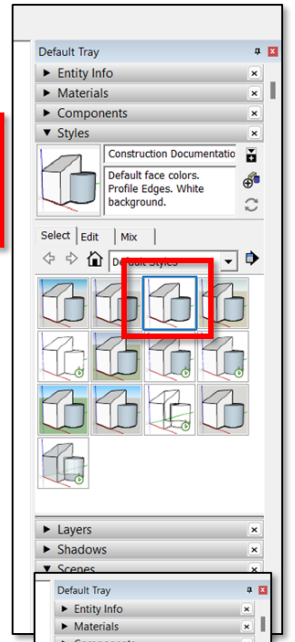


- Draw basic design
- Copy faces and move
- Extrude and add features
- Group – right click mouse – copy if needed









Sketchup settings

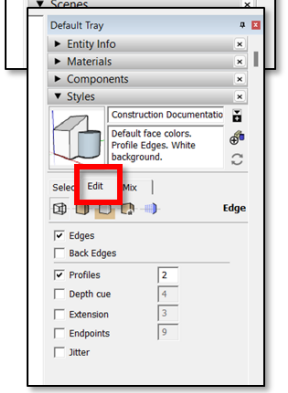
- **Style = construction style**
- **Render model with paint bucket – colours (plastic), patterns (speaker grill), glass (power LED)**
- **Parallel projection**
- **Camera = iso (isometric)**
- **After you can also use perspective or two-point perspective and reprint screen work**
- **View shadows**
- **Hide guides, axes, section cuts**

Apply dimensions

1. Draw a basic design
2. Copy surfaces and move, then extrude and add details
3. Group part (right click mouse) – copy if needed
4. Bring parts together
5. Print screen work and paste in
6. Move parts to create exploded view – re print screens and paste in

You can draw a solid model, but this will achieve a lower grade.

Optional
Use the edge style (back edges) to show inner details as well – it will look like dotted lines



Year 9: The Cold War

Key Vocabulary	Definitions
Communism	A theory or system of social organisation in which all property is owned by the community and each person contributes and receives according to their ability and needs
Capitalism	An economic and political system in which a country's trade and industry are controlled by private owners for profit
NATO	The North Atlantic Treaty Organisation, also called the North Atlantic Alliance, is an intergovernmental military alliance
Warsaw Pact	The Warsaw Pact was a collective defence treaty signed in Warsaw, Poland, between the Soviet Union and seven other Eastern Bloc socialist republics of Central and Eastern Europe in May 1955
Iron Curtain	The Iron Curtain is a term describing the political boundary dividing Europe into two areas from the end of World War II in 1945 until 1991.
Bloc	A group of countries or political parties with common interests who have formed an alliance.
Détente	The easing of hostility or strained relations, especially between countries.
Checkpoint Charlie	A crossing point between West Berlin and East Berlin when the Berlin Wall divided the city.

Importance of the conferences

Potsdam – the Grand Alliance discussed their ideas for the future of Germany. This went well despite the fact that the countries (Br, USA, USSR) had different aims.
When the leaders met again at Potsdam it was a different story. The leaders of Br and USA had changed and were alarmed by Stalin's actions in Europe. The relationships between these countries became much more hostile. The USA was suspicious of the USSR and all the allies had different views of what should happen to Germany after WW2.

Significance of the Berlin Crisis

The Berlin Crisis started when the USSR issued an ultimatum demanding the withdrawal of all armed forces from Berlin, including the Western armed forces in West Berlin. The crisis culminated in the city's partition into East and West Berlin with the East German building of the Berlin Wall.

Why was the Arms Race significant?

The arms race was important for 2 main reasons:

- It led to the fear of mutually assured destruction as each side had enough weapons to destroy the world many times over.
- The USA and the USSR had to find ways to solve disputes that did not result in a nuclear war.

Co-Existence

The period of peaceful coexistence occurred in the early 1950s. Nikita Khrushchev, the leader of the USSR between 1953 and 1964, is associated with the policy of peaceful coexistence. It meant living in peace with each other, although competition between the two superpowers could continue.

Cuban Missile Crisis

The Cuban Missile Crisis of October 1962 was a direct and dangerous confrontation between the United States and the Soviet Union during the Cold War and was the moment when the two superpowers came closest to nuclear conflict. They had only ever been involved in proxy wars before this threat

Why was the Vietnam War important?

It was the first war to come into American living rooms nightly, and the only conflict that ended in defeat for American arms. The war caused turmoil on the home front, as anti-war protests became a feature of American life. Americans divided into two camps--pro-war hawks and anti-war doves.

The Space Race

The Space Race played a significant part in the Cold War as the Americans and Soviets competed to prove their technological and intellectual superiority by becoming the first nation to put a human into space. From beginning to end, the world's attention was captivated by this contest for dominance.

What was Détente?

While Détente did not end the Cold War, it produced some significant achievements. The willingness of both superpowers to communicate led to arms reduction summits, the signing of anti-nuclear proliferation agreements and a reduction in nuclear arms stockpiles

Yalta Conference – Feb 1945

Potsdam Conference – May 1945

Berlin Blockade and airlift - 1948 - 49

USSR tests its first nuclear weapon - 1949

USA tests the first hydrogen bomb - 1950

The Space Race begins – 1957

Vietnam War - 1959 - 1975

The Berlin Wall - 1961

Cuban Missile Crisis - 1962

Establishment of a hotline phone between USA and USSR - 1963

Berlin Wall comes down - 1989

USSR collapses and the Cold War ends - 1991