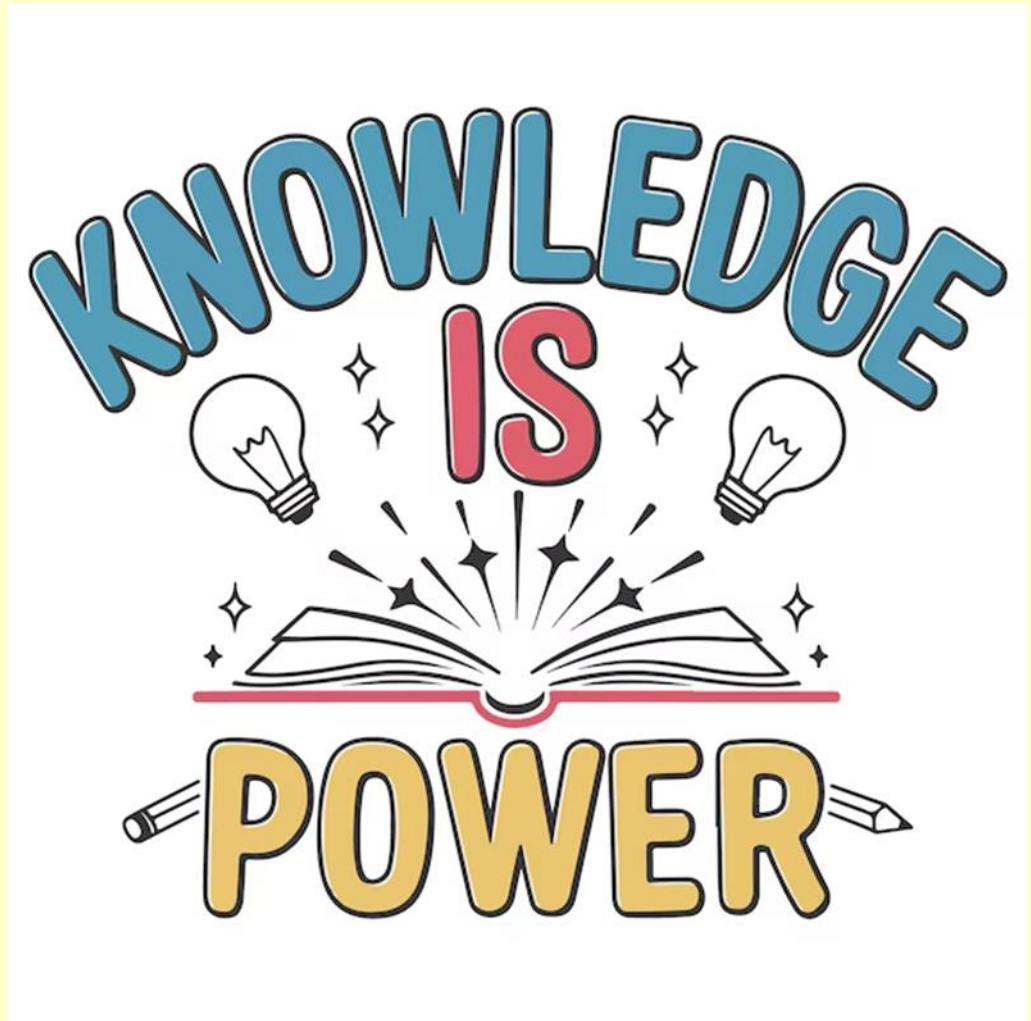


Open  
Academy  
Year 9  
Knowledge  
Organiser

Spring Term  
1



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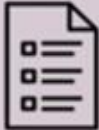






Page 24 – Physical Education – Topic: Football

Page 25 - Religious Studies – Topic: Is it reasonable to believe in Life after Death?

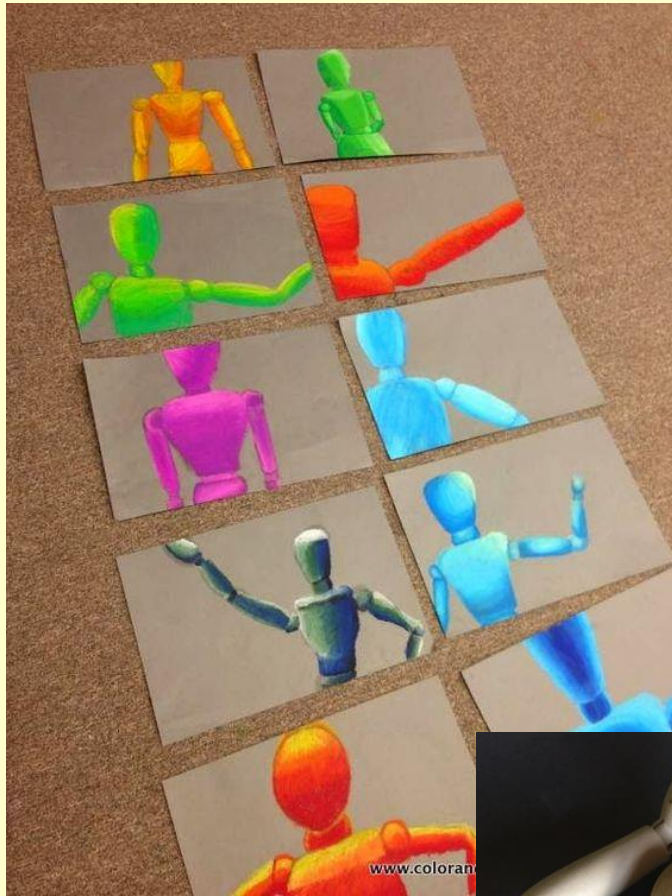
Page 26 – Science –Topic 1: Architect module. Topic 2:Teacher module

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# How to use your Knowledge Organiser: Step by step guide

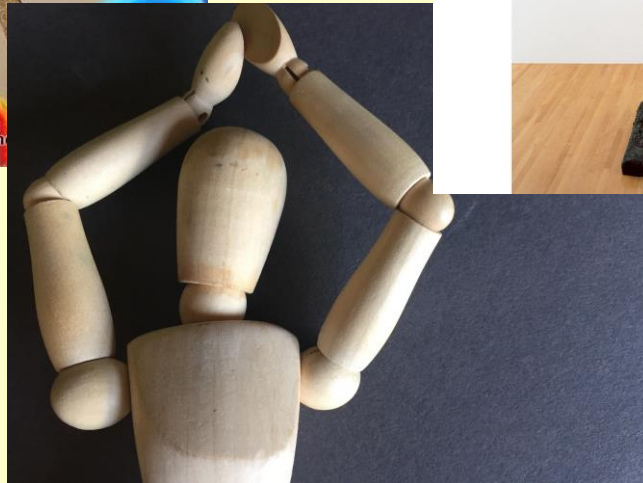
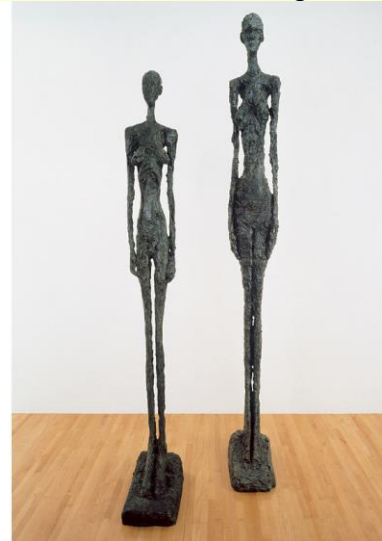
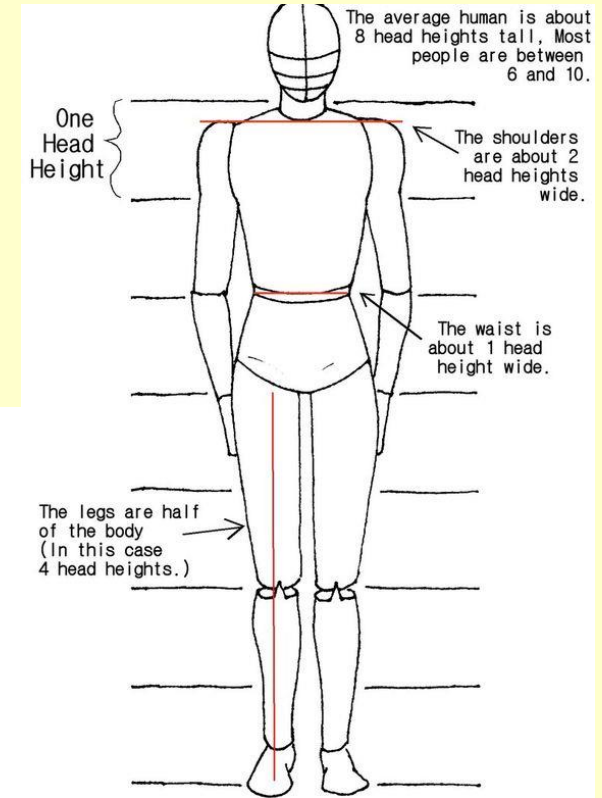
	Look, Cover, Write, Check	Definitions of Key Words	Flash Cards	Self Quizzing	Mind Maps	Paired Retrieval
Step 1	<p>Look at and study a specific area of your KO.</p> 	<p>Write down the key words and definitions.</p> 	<p>Use your KO to condense and write down key facts or information onto flash cards.</p> 	<p>Use your KO to create a mini quiz. Write down your questions using your KO.</p> 	<p>Create a mind map with all the information you can remember from your KO.</p> 	<p>Ask a friend or family member to have the KO or flash cards in their hands.</p> 
Step 2	<p>Cover or flip the KO over and write down everything you can remember.</p> 	<p>Try not to use your KO to help you.</p> 	<p>Add pictures to help support. Then self-quiz using the flash cards. You could write questions on one side, and answers on the other!</p> 	<p>Answer the questions and remember to use full sentences.</p> 	<p>Check your KO to see if there are any mistakes on your mind map.</p> 	<p>They can test you by asking you questions on different sections of your KO.</p> 
Step 3	<p>Check what you have written down. Correct any mistakes in green pen and add anything you have missed. Repeat.</p> 	<p>Use your green pen to check your work.</p> 	<p>Ask a friend or family member to quiz you on the knowledge.</p> 	<p>Ask a friend or family member to quiz you using the questions.</p> 	<p>Try to make connections, linking the information together.</p> 	<p>Write down your answers,</p> 

# Year 9 Art – Topic: Human Figure



Year 9 are looking at the Human Figure this term and making drawings from the wooden mannequins.

Students are studying proportion and how to Apply tone to show 3D form on the figures



Make a drawing of this figure using pencil tone

We are learning about the figure artist Giacometti this term. He produces tall thin sculptures of people that show how it feels to be human. Specifically, they show the vulnerability and fragility of human life. If working from home, can you make drawings of these figures using pen, pencil and ink.

# Year 9 Computer Science – Topic: Spreadsheets

## Topic 1 – Key takeaways:

Arithmetic operators perform basic math operations, such as addition, subtraction, and multiplication.

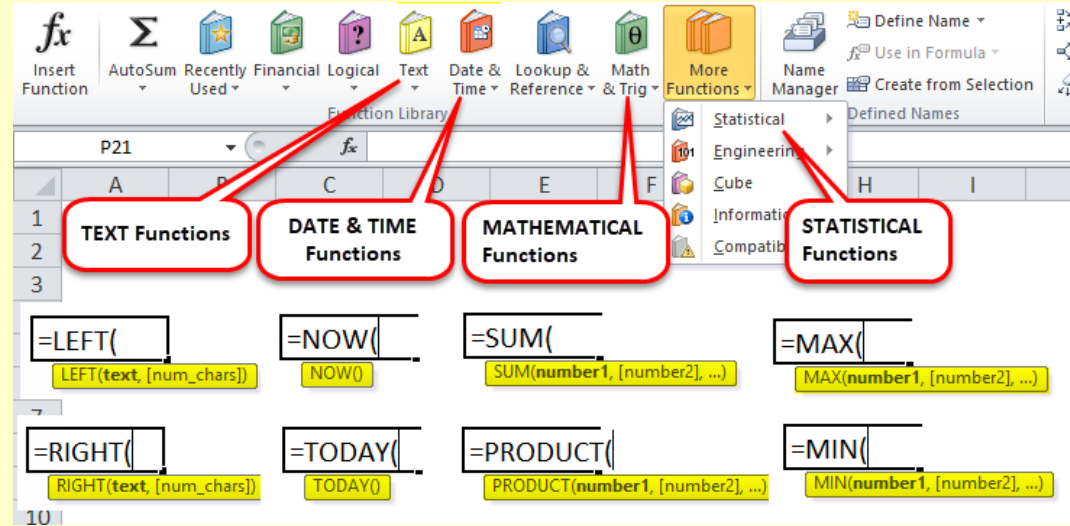
Excel allows you to automate calculations using formulas like =A1+B1.

Conditional formatting highlights data based on predefined rules, such as color-coding cells.

It helps identify patterns and outliers in large datasets.

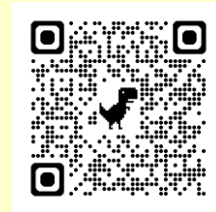
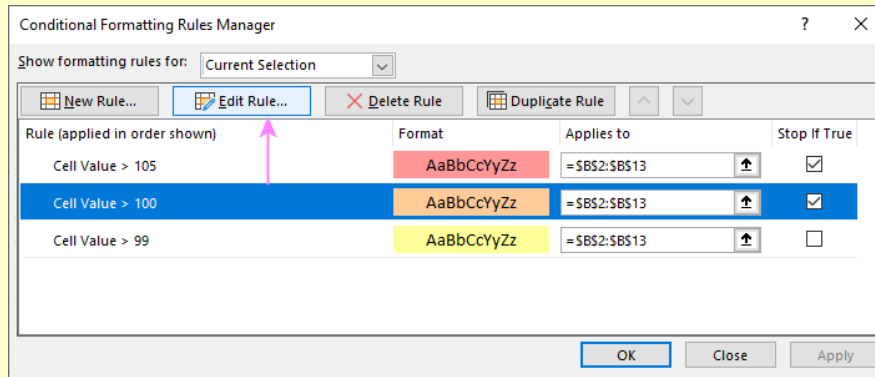
The VLOOKUP function retrieves data from a table based on a lookup value.

It simplifies the process of finding specific data in large datasets.



## Topic key vocabulary:

Formula  
Rows  
Cells  
Columns  
Logic test  
Rule  
=SUM  
=VLOOKUP



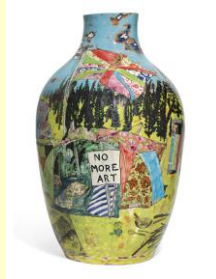
	A	B	C	D
1	Product	Delivery status	Action required	
2	Apples	delivered	No	
3	Bananas	In transit	Yes	
4	Cherries	Delivered	No	
5	Kiwis	Out for delivery	Yes	
6	Lemons	In transit	Yes	
7	Mangos	Delivered	No	
8	Oranges	DELIVERED	No	
9	Peaches	Out for delivery	Yes	

Key Questions: What formula would you use to calculate the total of three values in Excel?

How would you use an IF statement to highlight overdue payments?

Lookup Table – A table used to retrieve specific data with a lookup function.

# Year 9 Design and Technology – Topic: Screen Printing



## Word Bank

Stencil  
Grayson Perry  
Craft Knife  
Shape  
Composition  
Blocking  
Detail  
Screen Printing  
Squeegee  
Colour Mixing



These are the key principles of design we will be looking at this term when producing a screen printed sample in the style of Grayson Perry.

## Exam Style Questions?

- Which practical skills will you use when making your stencils?
- What are the key Health and Safety considerations when using a craft knife to make your stencils?
- How will you think hard about colour mixing and shape to make sure your print is as successful as possible?
- What refinements will you make to your stencil through trial and error to continuously improve your stencil?

## Grayson Perry – Fact File

### **Full Name:**

Grayson Perry

### **Born:**

March 24, 1960

### **Place of Birth:**

Chelmsford, Essex, England

### **Occupation:**

Artist, Sculptor, Writer, Broadcaster

### **Known For:**

- Ceramics (particularly large, often narrative-driven pots and vases)
- Publicly addressing identity, gender, and social issues through his artwork
- His alter ego, "Claire," an embodiment of his female persona

## How to Screen Print:

1. Tape your stencil upside down on the front of the silk screen, covering all of the areas you don't want paint to go through.
2. Place your fabric flat on the table and position the screen on top.
3. Mix your paint ratio 3:1 paint to printing medium and mix well until smooth.
4. Apply in a line to at the top of the screen. Use the squeegee to pull the paint through the screen 3 times, the bang off the excess and do a dry pull. Make sure someone is holding the screen down!
5. Lift the screen off carefully and repeat the desired amount of times.
6. Strip and wash the screen and leave the printed fabric to dry. You should see light through the screen when it is clean.

## Useful Links

<https://www.youtube.com/watch?v=xCINKXM1pao>

<https://www.channel4.com/programmes/graysons-art-club>

<https://www.royalacademy.org.uk/art-artists/name/grayson-perry-ra>



# Drama – Topic: Interpretating a text

Meaning can be communicated both physically and vocally. The following are skills used by actors to interpret and communicate characters' personality and intention.

## Key Vocab

- Body Language – Showing what you feel by the way you stand.
- Gesture – how you communicate with your hands and/or arms.
- Facial expression – showing what you feel on your face.
- Voice tone – the emotion that you are putting into your voice. E.g an angry tone of voice.
- Emphasis – where you stress certain words to show meaning.
- Pitch – how high or low you are speaking.
- Pace – how fast or slow you are speaking.
- Pause – Allowing breaks in the speaking
- Accent – changing the way you speak to show where you are from.



## Key Questions:

What facial expressions are being shown above?

Where is the scene below set? When is the scene taking place? Who is in the scene? What is he like? Why is he there?

## Scene 1

*The street. A litter bin. A yellow spot comes up on Link. He looks bored. His clothes are scruffy and he looks dirty. He takes a good look at the audience then speaks them.*

**Link:** Have you ever sat and watched people, really watched them? They're all in their own little world. Now and then they'll let you in, if they're feeling brave or if they think they know you. But the rest of the time you might as well be invisible.

Interpreting a text means taking the words or script written by someone else and find a way of bringing that play to life, some people call it from page to stage.

Exercises which might help you understand a character from a play you are exploring may include:

**The given circumstances** – Using the ideas of Constantin Stanislavski, think about who the characters are, where the play is set, when the play is set, what has just happened, why the characters are there.

**Stage business** – thinking about what your character is doing on stage to make the performance more realistic and believable.

**Subtext** - Dramatic characters as well as real people often say one thing but mean another. Their meaning can be very different to the spoken words so that a sarcastic tone and a change of inflection can subvert the surface meaning of the words:

# Year 9 English – An Inspector Calls

## Plot summary

An Inspector Calls is set within the drawing room of a privileged British family. Their happy celebrations for a recent engagement will be interrupted by the arrival of the Inspector, who will interrogate them individually about their involvement in the death of a young, working-class woman. Each character is confronted with the consequences of their choices, some refusing to change their ways, while others show glimpses of reform. Priestley's drama invites the audience to consider our responsibility to look after one another and the role of the wealthiest classes in supporting the poor.



## Key characters and research prompts:

**The Inspector** – Priestley's mouthpiece, The Inspector examines the Birling family, revealing their roles in the death of a young woman. He forces the Birlings to consider their priorities.

**Research links between the Inspector and the author Priestley.**

**Mr Birling** – An embodiment of Capitalist Britain, Mr Birling is a man who has forgotten his roots and become obsessed by money.

**Research articles about social responsibility in 2025. Who might be a modern Mr Birling?**

**Sheila Birling** – Initially a childish figure, she steps out of her parents influence and recognises her wider responsibilities.

**Research young people who have made social change.**

## Links – Marxism

In Year 7 and Year 8 we read through the view of Marxism as we studied Lord of the Flies and Animal Farm. This asks us to consider how society is arranged into social classes and also how these different groups interact with each other. Marxism questions the chances of character's progressing through the hierarchy.

**Where do Priestley's sympathies lie in the drama?**

**How would we consider the relationship between the upper and lower classes in the drama?**

## Context

An Inspector Calls was written in the 1940s but is set in 1912. Its context matters greatly as the audience is asked to consider how much society has changed or remained the same in that time. It still speaks to an audience today, because many of the issues explored still exist.

Throughout the play, there are questions about the role of women in society, what role government and the wealthiest classes should play in looking after the poor and the potential consequences to individuals and society as a whole if it does not reform and start protecting its most vulnerable.

## Links

Our novels, To Kill and Mockingbird and Roll of Thunder, Hear My Cry both present situations where people are made outsiders and mistreat others. Think back to our work on psychoanalysis. What motivates people or drives them to do this?

**Tip: Consider this in your written work and why Priestley is making this point. What might he be saying to his audience?**



# Year 9 English – An Inspector Calls

## Study skills for this course:

What makes great analysis – a wide understanding of a text and an ability to draw upon a range of relevant evidence. However, it can be difficult to keep track of key quotations and references as we read.

1. Mindmap different characters with their key quotations as we go through the drama. Draw on these even when asked about a specific moment in the play.
2. Consider different contexts. How might someone respond differently or the same today?

## Example Progress Folder Tasks

How does Priestley characterise Mr Birling in the opening act of the play?

Write a diary entry from the perspective of Eva Smith detailing her experiences.

Explore the theme of social responsibility in the drama. How does the character of Sheila show the Inspector's optimism for the younger generation?

## Success Criteria

Analysis tasks require you to make sure you have specific ingredients in your answer. By Spring in Year 9, you will be familiar with these and need to develop them further.

**Thesis Statements** – Include an introduction that shows the 'golden idea' you're going to explore.

**Evidence** – Try to find more than one piece of evidence that supports your point. These should be relevant.

**Context** – What has motivated Priestley to make this choice?

## Ambitious Vocabulary

**Altruism** – Showing concern for the well-being of others.

**Capitalism** – An ideology that prioritises individual wealth.

**Cynical** – Doubtful of others' motives or actions.

**Exploitation** – Taking unfair advantage of others for personal gain.

**Hypocrisy** – Pretending to have beliefs or views that one doesn't actually have.

**Imperialistic** – The desire to extend control or influence. Also a policy of building an empire or taking over other land.

**Morality** – The distinction between right and wrong.

**Ominous** – Suggesting that something bad is about to happen.

**Prejudiced** – Unfair judgement or views of others. Linked to biased views of others.

**Subversive** – Intending to undermine or overthrow existing policies or actions.

## Dramatic / Linguistic Vocabulary

**Allegory** – A story with a moral message beneath the surface.

**Characterisation** – A method of giving a character a personality through their words, actions and relationships.

**Dramatic Irony** – The audience knows something the character doesn't.

**Foreshadowing** – A hint of something that will become more significant as the story progresses.

**Stage Directions** – Instructions written by the playwright telling actors and directors how something should be staged.

**Symbolism** – Objects, names and settings representing something broader.

**Tip: Use the ambitious vocabulary in your answers and the dramatic vocabulary to identify the methods the author is using.**

# Year 9 Food Technology – Topic: Nutrients

## Nutrients

Macro nutrients – Needed in large quantities in the diet

1. Protein
2. Fats
3. Carbohydrates

Micronutrients – needed in small quantities in the diet

1. Vitamins
2. Minerals

## Protein

### Food sources

Animal –beef, pork, lamb, poultry (chicken, turkey, duck), fish, cheese, butter milk

Plant – beans, chickpeas, lentils, peas, nuts, seeds, found in smaller amounts in some vegetables such as spinach and broccoli.

### Function

Grown and repair of muscles and cells

## Example exam questions

What is the function of sugary and starchy carbohydrates? (2 marks)

Why is protein especially important for children? (2 marks)

What are the functions of fat? (3 marks)

List 5 food sources of plant-based protein (5 marks)

What is the macro nutrient found in the following ingredients – butter, sugar, flour, egg? (4 marks)

## Fat

There are two types of fat, saturated and non-saturated.

Saturated fats are classed as ‘unhealthy fats’, they are solid at room temperature and are generally animal based.

Unsaturated fats are classed as ‘healthier fats’ and are liquid or soft at room temperature and come from plant-based sources.

### Function

Keeps us warm (provides insulation), secondary source of energy, protects vital organs and bones.

### Food sources

Animal –beef, chicken skin, processed meat (sausages, salami, pepperoni), bacon, butter, cheese, full fat milk

Plant – vegetable oils (sunflower, olive, rapeseed), avocado, nuts, seeds

## Carbohydrates

There are two types of carbohydrates, complex and simple. They are also known as starchy (complex) and sugary (simple).

### Function

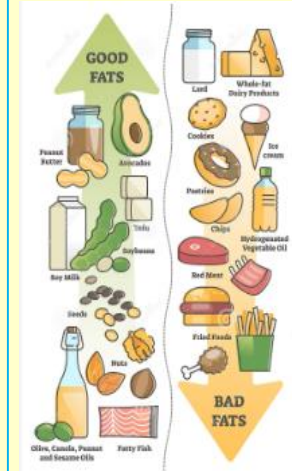
Starchy/complex carbohydrates are digested slowly and provide long term energy.

Sugary/simple carbohydrates are digested slowly and provide short term energy

### Food sources

Starchy – bread, rice, pasta, potatoes, bagels, oats, flour, cereal and some vegetables.

Simple – fruit, some vegetables, sugar, honey, syrup, sweets, fizzy drinks



## Key Vocabulary

Macro nutrients  
 Micronutrients  
 Protein  
 Fats  
 Carbohydrates  
 Vitamins  
 Minerals  
 Function  
 Sources  
 Types  
 Saturated  
 Unsaturated  
 Plant based  
 Animal Based

## Complex & Simple Carbohydrates

### Simple Carbohydrates



### Complex Carbohydrates



# Year 9 Geography – Topic: India

## India location

India is located in the southern part of the continent of Asia (sometimes called the '**Indian sub-continent**'). It once included Pakistan and Bangladesh in a united land area.

It has 9 neighbouring countries, these include Afghanistan, Pakistan, China, Nepal, Bhutan, Bangladesh, Myanmar, Maldives and Sri Lanka.



## India culture

India is a land of **diverse peoples**, city dwellers, countryside tribes, farmers, river traders, mountain farmers etc.

## Physical Geography

India has a varied **relief** including:

- the 3rd highest mountain of Kangchenjunga at 8,586m.
- Eastern and Western Ghats mountains.
- River Ganges and the Brahmaputra (sacred in Indian culture),
  - flooded swamps like the '**Sunderbans**'.
  - the most densely populated desert in the world, **the Thar desert**.
  - There are also **arid** areas, **tropical rainforests** in the south and **temperate forests** in the north, plus **coral reefs** off the coast.

## Assessment Tasks

India research HW  
Dharavi slums news report

## Human Geography

India now has the **largest population** of any country at 1.35billion people.

Cities in India have **grown rapidly** over the last 50 years, today the largest cities in India are Mumbai at 12m, Delhi at 11m and Bangalore at 9m.

As cities in India have grown they have experienced lots of problems such as a lack of housing, lack of water, poor **sanitation**, disease, **poverty**, waste and discrimination.

## Industry and growth

**Primary sector** farming for both **subsistence** (food for family) and sale at local markets is still a huge part of the economy.

**Secondary sector** industries such as manufacturing of textiles, plastics and steel.

Its 'bollywood' film industry is part of the **service sector** along with shops and financial and other services.

Growing **quaternary sector** that includes IT and electronics technology.

## Key Vocabulary

Monsoon  
Trade  
Himalayas  
New Delhi  
Mumbai  
Rice cultivation  
Hinduism  
Islam  
Buddhism  
Monsoon  
Kashmir  
Trade  
Call centres  
Slums  
Literacy  
Debt  
Colonialism  
Partition  
Subsistence  
Gandhi  
Greenhouse gases  
Desertification  
Development  
BRICS

# Year 9 German – Topic: Ambitions 1

## Wie bist du? What are you like?

abenteuerlustig	adventurous
kühn	daring
mutig	brave
ängstlich	fearful
feige	cowardly
verrückt	mad crazy
vorsichtig	cautious

Click on the link below to hear the words in the green box; [What type of job have you got?](#)

## Was für einen Job hast du? What type of job have you got?

Ich arbeite als ...	I work as
als Bademeister(in)	as a lifeguard
als Trainer(in)	as a coach
als Babysitter(in)	as a babysitter
Hundeausführer(in) walker	as a dog walker
als Zeitungsausträger(in)	as a newspaper boy/girl
in einem Café	in a café

Click on the link to practise some phrases  
[Textivate](#)

## Hast du einen Job?

Seit wann arbeitest du?	How long have you been working?
Ich arbeite ...	I've been working ...
seit einer Woche	for a week
seit sechs Monaten	for six months
Ich finde den Job ...	I find the job ...
toll	great
Interessant	interesting
okay	OK
nicht schlecht	not bad
langweilig	boring
furchtbar	awful
Ich mag den Job, weil ...	I like the job because ...
er interessant ist	it's interesting
er Spaß macht	it's fun
ich viel Geld verdiene	I earn a lot of money
Man muss ...	You have to ...
abwaschen	wash up
Ich mag den Job nicht, weil ...	I don't like the job because ...
er langweilig ist	it's boring
er keinen Spaß macht	it's no fun
ich nicht viel Geld verdiene	I don't earn a lot of money
Man muss	you must.....
sauber machen	clean
Salate vorbereiten	prepare salads
Man kann ...	You can ...
mit den Hunden laufen	run with the dogs
mit einem Ball spielen	play with a ball
fit bleiben	keep fit
Man darf (nicht)	You are (not) allowed to ...
essen	eat
spielen	play
Ich habe keinen Job, aber ich will als ... arbeiten.	don't have a job, but I want to work as.....

## Do you have a job?

## Würdest du ... ?

Ich würde ...	I would ...
nie	never
Vielleicht	maybe
bestimmt	definitely
mit Haifischen schwimmen	swim with sharks
Extrembügeln	
Machen	do extreme
ironing	
zum Mond fliegen	fly to the moon
Kakerlaken essen	eat cockroaches
den Mount Everest besteigen	climb Mount Everest

## Would you ... ?

Click on the link below to hear the words in the orange box; [Would you?](#)

Click on the link below to hear the words in the blue box:

[What are you like?](#)  
Can you add 5 more words in German to describe people?

Click on the link below to hear the Words in the grey box:  
[Do you have a job?](#)

# Year 9 History – Topic: The Holocaust

## Key Vocabulary

### 1. The origins of anti-Semitism and Jewish persecution.

Anti-Semitism is the hatred of Jewish people. Jewish persecution did not start with the Nazis. Jewish people have been persecuted for centuries in many countries. The Holocaust is when Nazi Germany murdered over 6 million Jewish people in World War II.

### 2. Jewish life in Europe before World War II.

- Jewish people lived in many countries in Europe. The largest Jewish populations lived in Eastern Europe. Poland had the largest population of Jewish people in the world.
- Some Jewish people, especially in Eastern Europe, lived a very traditional lifestyle based around their religion.
- Other Jewish people, particularly in western Europe, were more 'assimilated'. This meant that they typically followed the culture and traditions of the countries they lived in.
- Jewish people did not just identify themselves by their religion – they also identified by other means, for example by joining Jewish football clubs.

### 3. Nazi persecution of the Jews before World War II.

- Hitler hated the Jews. He believed that the Aryan (German) race was fighting the Semitic (Jewish) race for control of the world. He saw the Germans as a 'master race' and the Jews as 'sub-humans'.
- Hitler blamed the Jews for Germany losing World War I. He believed that the German army had been 'stabbed in the back'.
- Hitler wanted a 'pure' Aryan Germany, and to remove Jews and Eastern Europeans from other countries and take over their lands.
- Hitler accused the Jews of inventing communism, controlling big businesses and the world, and causing all of Germany's problems.
- Nazi persecution of the Jews involved propaganda, segregation, attempts to encourage emigration, and violence.

### 4. Persecution during World War II

- Germany captured lots of land at the start of World War II. This gave them control over millions of Jews in Poland and Russia.
- The Nazis forced Jewish people to live in 'ghettos'. A ghetto was a place where only Jewish people lived. They were not allowed to go in and out freely.
- There were many ghettos. The largest was in Warsaw, the capital of Poland.
- Conditions in ghettos were very bad. There was not enough space, food, or medical supplies. Many Jewish people died in them.

### 5. The Holocaust by bullets

- When the German army attacked Russia and Poland, they were followed by special soldiers called the 'Einsatzgruppen'.
- These soldiers did not fight battles. Their job was to murder enemies of the Nazis, especially Jews.
- They killed around 1.2 million Jewish people by shooting them.

### 6. Concentration camps

- The Nazis built places to murder Jewish people using gas. They were called concentration camps.
- Jewish people from all over Europe were transported to these camps by train.
- Some were selected to work, other were quickly murdered.
- The most well-known concentration camp was called Auschwitz. Around 1.1 million Jewish people were murdered there.

### Example exam questions

1. Write a definition of the term 'Holocaust' [1 mark]
2. Give one difference between Jewish people living in Eastern and Western Europe [1 mark]
3. Give two reasons why Hitler was anti-Semitic [2 marks]
4. Explain why the invasion of Poland and Russia was a turning point in the persecution of the Jews [5 marks]
5. Give two examples of the poor conditions in ghettos [2 marks]

- Anti-Semitism
- Aryan
- Auschwitz
- Concentration camp
- Communism
- Einsatzgruppen
- Extermination
- Ghetto
- Holocaust
- Jew
- Master race
- Nazi
- Persecute / persecution
- Propaganda
- Segregation
- SS
- Sub-human

# Year 9 Maths - Unit 6 – Number Skills

## What do I need to be able to do?

- Identify integers and rational numbers
- Work with negative numbers
- Solve problems with numbers
- Find HCF and LCM
- Add and Subtract Fractions
- Multiply and Divide Fractions
- Write Numbers in Standard Form

## Vocabulary

- Denominator:** the bottom number in a fraction
- Factor:** integers that multiply to make another integers
- Integer:** a whole number that is positive or negative
- Inverse operation:** the operation that reverses the action
- Irrational:** a number that can not be made by dividing two integers
- Multiples:** numbers belonging to the times table of that number
- Numerator:** the top number in a fraction
- Product:** the answer of a multiplication
- Quotient:** the answer of a division
- Rational:** a number that can be made by dividing two integers

### Directed number R

**Addition**

$2 + -4 = -2$

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

Two  $-1$ 's left  $--2$

Generalisation:  $+ - = -$

**Subtraction**

$2 - -1 = 3$

Representation for calculation

"Subtract" – means take away or remove

Take away one

Start with the representation of 2

Generalisation:  $- - = +$

### Multiplication

$-2 \times -3 = 6$

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

Divisions are the inverse operations

$a = 5$     $b = -4$

Brackets around negative substitutions helps remove calculation errors

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

### Standard form R

Any number between 1 and less than 10  $\rightarrow A \times 10^n$   $\leftarrow$  Any integer

$6 \times 10^5 + 8 \times 10^5$   
 $= 600000 + 800000$   
 $= 1400000$   
 $= 1.4 \times 10^6$

$(1.5 \times 10^5) \div (0.3 \times 10^5)$   
 $1.5 \div 0.3 \times 10^5 \div 10^5$   
 $= 5 \times 10^0$

Adding Fractions



Negative Numbers



Standard Form



Adding in Standard Form



## Integers, real and rational numbers

Rational – root word: ratio

Real numbers:  $\frac{2}{3}$  stems from 2 (2 of the whole)

Irrational numbers:  $\sqrt{2}$  the solution is a decimal that never ends and does not repeat.

The square root of a negative is not a real number and cannot be found

## HCF/LCM

R

1 is a common factor of all numbers

Common factors are factors two or more numbers share

HCF – Highest common factor

HCF of 18 and 30

18 1, 2, 3, 6, 9, 18

30 1, 2, 3, 5, 6, 10, 15, 30

HCF = 6

LCM – Lowest common multiple

LCM of 9 and 12

9 9, 18, 27, 36, 45, 54

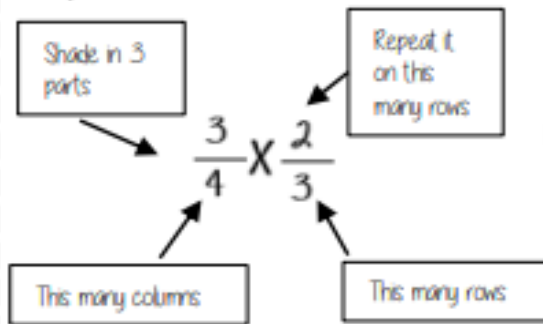
12 12, 24, 36, 48, 60

LCM = 36

The first time their multiples match

## Multiplication/ Division of fractions

R



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

Modelled:

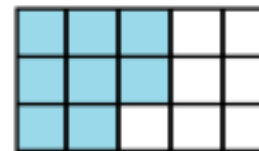
Remember to use reciprocals

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

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

Multiplying by a reciprocal gives the same outcome

Represented

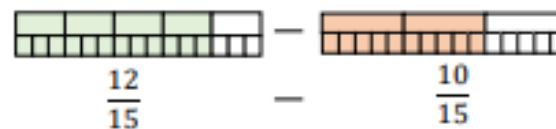


$$= \frac{8}{15}$$

## Addition/ Subtraction of fractions

R

$$\frac{4}{5} - \frac{2}{3}$$



$$= \frac{2}{15}$$

Use equivalent fractions to find a common multiple for both denominators

Highest Common Factor



Lowest Common Multiple



Dividing Fractions



A job involving number:

Forensic Scientist

Forensic scientists use the principles of biology, chemistry and maths to analyse evidence and solve criminal investigations. Crime scenes can reveal bloodstain patterns that are used to calculate the position of the murderer/victim and even the type of weapon that was used.



# Year 9 Maths - Unit 7 – Using Percentages

## What do I need to be able to do?

- Convert between fractions, decimals and percentages
- Use Percentage Multipliers
- Calculate percentage increase and decrease
- Express Percentage Change
- Solve Reverse Percentage Problems
- Solve Percentage Problems

## Vocabulary

**Decimal:** a number to the right of the decimal place.

**Equivalent:** of the same value

**Fraction:** represents how many parts of a whole number you have

**Integer:** a whole number with no decimal

**Invest:** use money with the goal of increasing its value over time

**Growth:** to increase or go up

**Multiplier:** the number you are multiplying by to find a percentage

**Percent:** parts per 100 – written using the % symbol

**Profit:** the income takeaway the costs

**Reduce:** to make smaller in value

### FDP Equivalence R

Percentage  
100% = a whole = 100 hundredths

10 hundredths  
10 out of 100  
10%

$\frac{10}{100} = \frac{1}{10} = 0.10$  One hundredth  
(one whole split into 100 equal parts)

ones	tenths	hundredths
	•	•

### Converting FDP R

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

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

70 hundredths = 70%

Be careful of recurring decimals

eg  $\frac{1}{3} = 0.3333333$   
 $\frac{1}{3} = 0.\dot{3}$

The dot above the 3

Fractions  
Decimals  
Percentages



Percentage  
of amount



Percentage  
Multipliers



Fraction of  
Amount



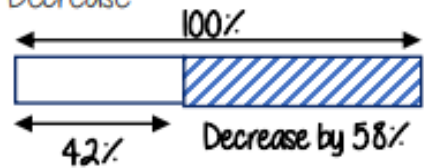
Percentage  
Increase





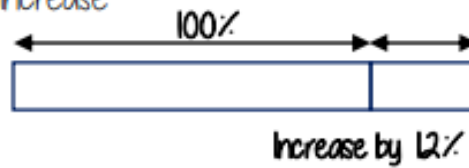
## Percentage Increase/ Decrease R

Decrease



Multiplier  
Less than 1  
 $100 - 0.58 = 0.42$

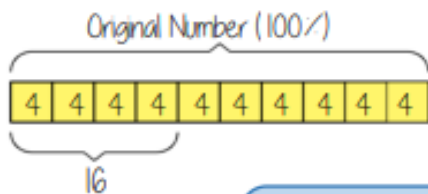
Increase



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

## Reverse Percentages

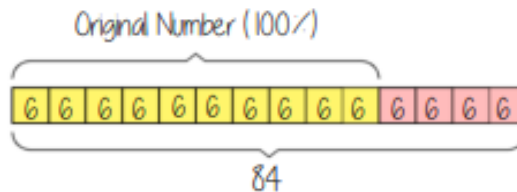
40% of my number is 16  
What am I thinking of?



$40\% = 16$   
 $10\% = 4$   
 $100\% = 40$

Try to scale down to 10% or 1% and then scale back up to 100%

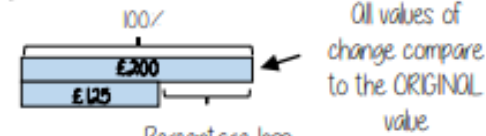
140% of my number is 84. What is the original number?



$140\% = 84$   
 $10\% = 6$   
 $100\% = 60$

## Percentage change R

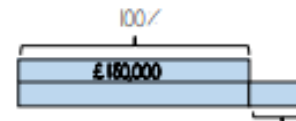
I bought a phone for £200  
A year later sold it for £125



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

$\frac{\text{Difference in values}}{\text{Original value}} \times 100$

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



Money made (profit value)  $\frac{36000}{180000} \times 100 = 20\%$

Percentage Change



Expressing Percent's



Reverse Percentage



A career involving number:

Cryptanalyst



Cryptanalysts analyse and decipher secret code, decoding messages for government and law enforcements. They help provide privacy for people and businesses, keeping hackers away from important data. They are constantly working on new ways to encrypt information and keep it safe.

# Year 9 Maths Unit 8 – Maths and Money

## What do I need to be able to do?

- Solve problems with bills and bank statements
- Calculate simple interest
- Calculate compound interest
- Calculate wages and taxes
- Solve problems with exchange rates
- Solve best buy problems
- Calculate money problems

## Vocabulary

- Balance:** the amount of money in a bank account  
**Credit:** money being placed into a bank account  
**Currency:** the type of money that a country uses  
**Debit:** money that leaves a bank account  
**Deposit:** an initial payment (often a way of securing a purchase)  
**Expense:** a cost or outgoing  
**Multiplier:** a number you multiply by to find a percentage  
**Per annum:** each year  
**Unitary method:** to find the cost of one

Bank Statements



Simple Interest



Compound Interest



Best Buys



## Bills and Bank Statements

**Bills** – tell you the amount items cost and can show how much money you need to pay

Some can include a total  
 Look for different units  
 (Is it in pence or pounds)

Menu	Price
Milk	89p
Tea	£1.50

## Bank Statements

Bank statement can have negative balances if the money spent is higher than the money coming into the account

Date	Description	Credit	Debit	Balance
1 <sup>st</sup> Sept	Salary	£1500		£1500
1 <sup>st</sup> Sept	Mortgage		£600	£900
25 <sup>th</sup> Sept	Baby Money	£15		£915

## Simple Interest

For each year of investment the interest remains the same

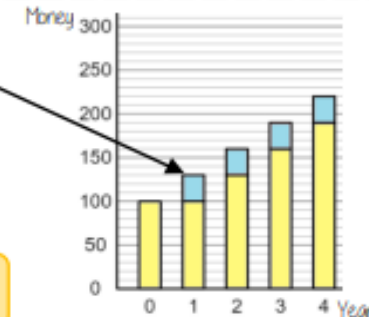
$$\text{Principal amount} \times \text{Interest Rate} \times \text{Years}$$

$$100$$

Principal amount is the amount invested in the account  
 eg Invest £100 at 30% simple interest for 4 years

$$\frac{100 \times 30 \times 4}{100} = £120$$

This account earned £120 interest  
 At the end of year 4 they have £220



## Compound Interest

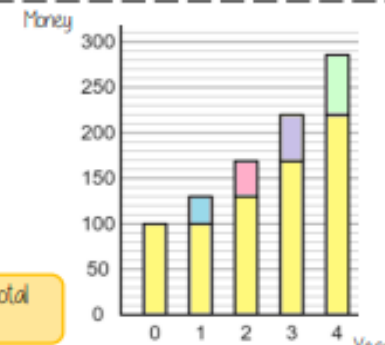
Interest is added to the current value of investment at the end of each year so the next year's interest is greater

$$\text{Principal amount} \times \text{Multiplier}^{\text{Years}}$$

eg Invest £100 at 30% compound interest for 4 years

$$100 \times 1.3^4 = £285.61$$

This account has £285.61 in total  
 at the end of the 4 years



## Value Added Tax (VAT)

VAT is payable to the government by a business. In the UK VAT is 20% and added to items that are bought.

Essential items such as food do not include VAT.

## Wages and Taxes

Salaries fall into tax brackets – which means they pay this much each month from their salary

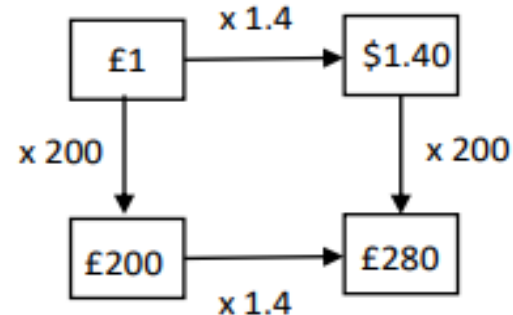
Taxable Income	Tax Rate
£12 501 to £50 000	20%
£50 001 to £150 000	40%
over £150 000	45%

Over time:

Time and a half – means 1.5 times their hourly rate

Double – 2 times their hourly rate

## Exchange Rates



When making estimates it is also useful to use estimates to check if our solution is reasonable.

Use inverse operations to reverse the exchange process

### Common Currencies

United Kingdom	£	Pounds
United States of America	\$	Dollars
Europe	€	Euros

## Unit Pricing

4 Oranges £1	5 cupcakes £1.20
-----------------	---------------------

$$\begin{array}{l}
 4 = \text{£}1.00 \\
 2 = \text{£}0.50 \\
 1 = \text{£}0.25
 \end{array}
 \begin{array}{l}
 \div 2 \\
 \div 2 \\
 \div 2
 \end{array}
 \quad
 \begin{array}{l}
 5 = \text{£}1.20 \\
 1 = \text{£}0.20
 \end{array}
 \begin{array}{l}
 \div 5 \\
 \div 5
 \end{array}$$

Cost per Unit

To calculate unit per cost you divide by the cost

Cupcakes are the best value as one item has the cheapest value

There is a directly proportional relationship between the cost and number of units

Tax



Unitary Method



Currency Conversions



Exchange Rates



A career involving number:

Banker



A Personal Banker is a finance professional who manages the accounts and finances of their clients. They are responsible for overseeing all aspects of their clients' accounts, providing them with banking services like loans or credit cards, and advising investment opportunities.

# Year 9 Physical Education – Topic - Rugby



## Key skills

### Passing & Use of Space

Is being able to accurately replicate prior learnt types of passes and performing these in a game to retain ball possession & outwit opposition. Also understanding what the use of space means for attacking opportunities.

### Outwitting opponents - 5 vs 3

Is developing knowledge and understanding of strategic play used to outwit opponents. This means developing and refining tactics based on the analysis of opposition. This also means to begin to correctly officiate.

### Tackling & Rucking

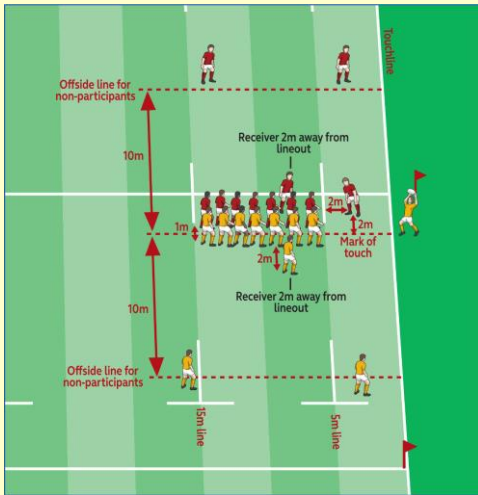
Is developing an understanding & knowledge of how to perform a ruck and to replicate the correct tackling & rucking technique. This includes understanding the safety aspects of tackling and the rules regarding rucking and offside.

### Restarting play - Line Outs

Is being able to perform a small line out with the correct technique and understanding how a line out is formed with the necessary positions.

### Scrum development

Is developing the knowledge & understanding of how to form a 3-man scrum, understanding and accurately describing the scrum positions and to develop knowledge of when a scrum is used. Then integrating scrummage skills into a small sided game after an infringement.



## Scrum

A scrum will be awarded for:

a forward pass, a knock on, where the ball does not emerge from a maul or ruck; or when the ball becomes unplayable.

The referee will call “Crouch” and then “Bind”. The front rows crouch and using their outside arm each prop must bind onto the body or side of their opponent and the second rows crouch and bind onto the prop in front of them.

Following a pause, the referee calls “Set” only when the front rows are ready. The front rows may then engage.

## Key Vocabulary

- Backwards
- Conversion
- Line Out
- Offside
- Outwit
- Pass
- Penalty
- Possession
- Ruck
- Scrum
- Tackle
- Tactical

## Rules of The Game



# Year 9 Physical Education – Topic - Cheerleading

## Skills

I can perform in the role of base (holds the flyer), support (helps flyer get in and out of position) or flyer (person who is held up)

I can perform low level stunts, eg. thigh stand, modified prep and load

I can use transitions to link stunts together, entries and dismounts must link smooth and flow

I can use jumps (straight, star, tuck, pike, straddle) and tumblers in the routine to improve the dynamics and as transitions

I can use choreographical techniques such as cannon, unison, mirroring and formation

I can learn a short dance piece to be included in the routine

## Health and Fitness

I can warm up effectively in preparation for cheerleading (pulse raiser, mobilisation and preparation stretches)

I can identify the different components of fitness required to perform well in cheerleading.

I can identify ways in which I could improve these components of fitness.

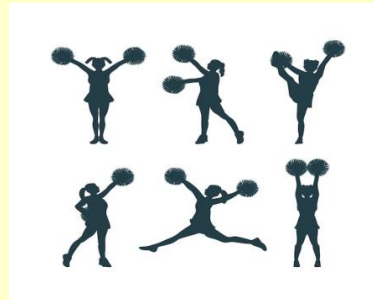
## Choreography

I can critically evaluate my own and other performances and give feedback to help improve work.

I can use technical language in planning routines and performances.

I can work with my group to plan a routine

I can put my choreography to music



## Leadership

I bring correct kit for PE

I show willingness to improve by actively engaging in each lesson as either a base, support or flyer

I can successfully coach as part of small group.

I can identify strengths and weaknesses in my own and others performance.



## Key Vocabulary

Body tension and extension  
Control  
Base, support, flyer  
Transitions  
Stunts  
Unison, cannon, mirroring  
Tumble  
Jump

## Rules

Remove all jewellery, tie back long hair and have bare feet or grip socks

Perform as a base, support or flyer

Hold balances for 3 seconds

All routines should have a clear start and finish

Always perform agilities on a mat

Always have good tension, extension, and control

# Year 9 - Physical Education – Topic - Health Related Fitness

## Continuous training

This type of training involves a steady but regular pace at a moderate intensity which should last for at least 30 minutes. Activities can include running, walking, rowing or cycling.



## Fartlek training

This means **Speed Play** in Swedish. It is a combination of different intensities. *i.e. 30 seconds Sprinting, 30 seconds walking, 30 seconds jogging.* There is NO rest in fartlek training.



## Free weights/resistance machines

Free weights and resistance machines can be used to improve a muscle's endurance capacity. To improve endurance, you must have high repetitions low weight. To improve muscular strength, it must be low repetitions and high weight.



## Circuit training

Circuit training is a series of exercises completed one after another. It is a very good way of developing strength and muscular endurance people training is usually done with a group of people, and you rotate after 30 seconds of an exercise. Circuit training may have rest periods, but it is usually high intensity and uses a range of muscles in the body.

## Interval training

This training involves periods of work followed by periods of rest. This training is like fartlek but in interval training you must have rest. For example: You might run for 2 minutes and then rest for 1 minute.



## SAQ (Speed, Agility, Quickness)

This training involves exercises that change direction quickly. Rapid energetic movements over a short distance are designed to replicate specific actions from sports such as rugby, basketball and football.



## Static active/static passive/PNF Stretching

**Static Passive stretching:** This requires the help of an external force, such as a partner, gravity or a wall causing the muscle to stretch.

**Static Active stretching:** The performer applies internal force on a joint, pushing it beyond its point of resistance (lengthening the muscles)

**PNF (proprioceptive neuromuscular facilitation)** is where the muscle is contracted isometrically for a period of at least 10 seconds. It is then relaxed and stretched again, usually going further the second time.

## Plyometrics

**Plyometrics** training refers to any exercise that enables the muscle to reach maximal force in the fastest possible time.



## Key Vocabulary

Continuous  
Fartlek  
Free weights  
Resistance  
Circuit  
Speed  
Agility  
Plyometrics  
Interval

# Year 9 Physical Education – Topic: Pickleball

## Scoring:

First Number score of the serving team

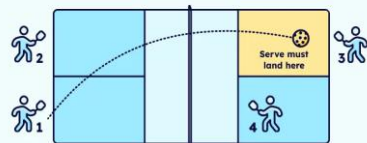
Second Number score of the receiving team

Third Number which player of the team is serving, first server (1) or second server (2)

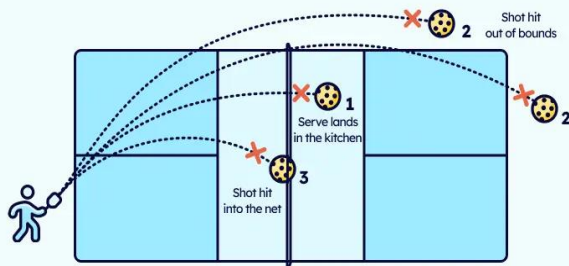
**3 - 3 - 1**

Serving team's score    Receiving team's score    Current server (will be 1 or 2)

## Serving and faults:



PICKLEHEADS



PICKLEHEADS

## Shots:

### Dinks

Played closer to the net, these touch shots are hit into your opponent's kitchen and help keep the other team from attacking.



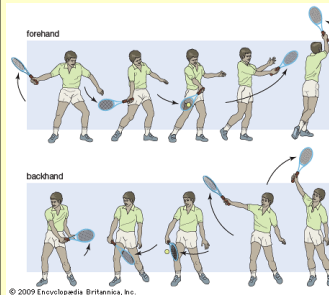
### Drop Shots

Played at the back of the court, these shots aim to land in the opponent's kitchen to keep them from attacking.



### Forehand/ backhand Drives

These powerful shots are hit off the bounce, often from the baseline. They are played using a forehand or backhand swing.



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### Volleys

These shots are hit out of the air before the ball bounces. They can only be played outside the kitchen.



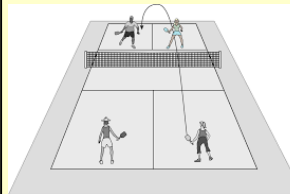
### Smash

The overhead smash is designed for one thing and one thing only: to destroy the ball and make it impossible for your opponents to return it.



### Lobs

These shots are hit high into the air to move opponents away from the kitchen.



### Overheads

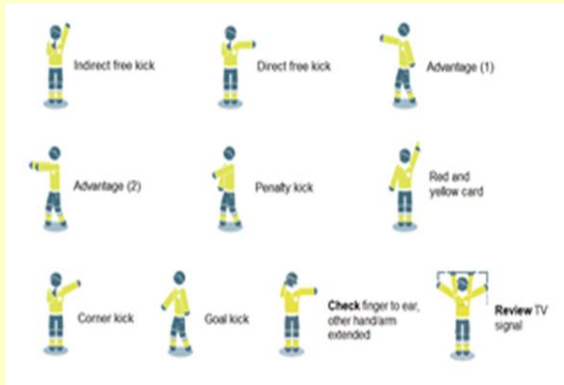
Shots hit above the head with a tennis serving motion, used to attack lobs before they bounce.



## Key words:

Score  
Serve  
Dink  
Drop shot  
Volley  
Forehand  
Backhand  
Lob  
Smash  
overhead

# Year 9 Physical Education – Topic: Football



## Officiating in Football

Each match is controlled by a referee who has full authority to enforce the Laws of the Game in connection with the match.

The officials must be respected at all times.

Their role is to give free kicks, whether to award a goal, give yellow or red cards for fouls/decent and the result of the match.

### PLAY ADVANTAGE

Allows play to continue when an offence occurs, and the non-offending team will benefit from the advantage and penalises the offence if the anticipated advantage does not ensue at that time or within a few seconds

Referee signals (SEE Above)

## Key skills

**Passing** - To understand the benefits of passing and where different types of passes should be used i.e. Over defensive line. To be able to outwit opponents with a variety of passes.

**Control & Turning** - To be able to use the different parts of the body to control the ball. To perform and replicate different types of dribbling with control, speed and fluency in a pressured situation. To outwit opponents with the combination of advanced turns and dribbles making decisions about how best to advance on opposition.

**Attack/Beating an opponent** - To be able to outwit opponents using dummies & fakes at speed. To understand the importance of width and playing into space in order to attack. To develop strategic and tactical play.

**Shooting** - To perform a variety of shooting techniques on goal. i.e. low drive, chip and volley. To develop their understanding and knowledge of how to execute a successful shot on goal i.e. success criteria. To appreciate how to adjust shot selection based on opponents positioning.

**Defensive Tactics** - To develop their understanding and knowledge of how to stop attack effectively. To perform the different types of defensive techniques in different situation.

**Set Plays** - To perform crosses using varying height, speed and positioning. To develop creativity in developing new strategies from corner kicks in attack and defence.

## PRIOR LEARNING

**It is helpful if the pupils have:**

Experienced setting up and organising football practices in groups.

Applied and adapted the principles of attack and defence in small, sided games

Lead own warm up and cool down safely.

Learnt about specific techniques  
Used and applied football rules correctly.

## Key Vocabulary

Offside  
High-line  
Man-to-man  
Offside trap  
Through pass  
Touch line  
Pressure  
Attack  
Defence  
Push-up  
Goal side  
Play-on  
Advantage



# Year 9 Religious Studies – Topic: Is it reasonable to believe in Life after Death?

## Muslim beliefs in Life After Death

Muslims believe that this world will come to an end on a day Allah has appointed. "Every soul shall have a taste of death; and only on the Day of Judgment shall you be paid your full recompense..." (Qur'an 3:185).

Everything will be annihilated, and all of the human beings who had lived in this world will then be restored to life and will be presented before Allah.

The entire record of every man and woman - of all their deeds and misdeeds - will be presented before Allah for final judgment.

"We shall set up scales of justice for the Day of Judgment, so that not a soul will be dealt with unjustly in the least..." (Qur'an 21:47).

One who excels in goodness will, by the Mercy of Allah, receive a goodly reward; one whose wrongs outweigh his good deeds will be punished.

It is neither fair nor just to treat everyone equally. "Is then the man who believes no better than the man who is rebellious and wicked? Not equal are they" (Qur'an 32:18).

Allah on that day will judge with Justice, and every soul will receive what it has earned.

While unsure of their fate in the Hereafter,

Muslims are confident of the Mercy and Justice of Allah. "Say: 'Oh My servants who have transgressed against their own souls!

Despair not of the Mercy of Allah, for Allah forgives all sins, for He is Oft-Forgiving, Most Merciful.'" (Qur'an 39:53). Those who emerge

successfully from Judgment will go to eternal Paradise; those who are condemned and deserve punishment will be sent to Hell.

Allah is the perfect and fair Judge.

## Christian Beliefs on Life after Death

Christians interpret the teachings of the Bible on life after death to mean that humans will have a spiritual existence after death, rather than a physical one.

Belief in life after death may be influenced by the meaning and purpose that it gives to the lives of Christians.

The guiding principle of life after death for Christians is that Heaven is seen as a reward for those who have been faithful. Teachings are interpreted in the following ways.

Christians do not believe that they should do good actions just to be rewarded, but rather because it is right to do good. However, the consequence of good actions will be a place in Heaven. Christians try to build up a relationship with God during their lives through prayer and worship. This relationship is also shown in living by God's laws, as expressed in the Ten Commandments. Most Christians reject the idea of reincarnation

For Christians, God makes each individual unique and He loves them as they are. This unique individual is made up of body and soul.



## Exam questions

1. What is the soul? (2 marks)
2. Explain using examples of why Christians believe in life after death. (4 marks)
3. List 3 reasons why an atheist may not believe in life after death. (3 marks)
4. What do you think about near death experiences? (2 marks)
5. "Life after Death does not make sense" Do you agree/disagree. Give reasons.

## Key Vocabulary

Eternal Life  
Soul  
Immortal  
Heaven  
Hell  
Sins  
Judgement  
Fate  
Destiny  
Deeds  
Karma  
Punishment  
Suffering  
Spiritual

## The afterlife

Life after death is a fundamental belief in most religions.

What form life after death takes is different in each religion, and sometimes there is a difference of belief between members of the same religion.

Some people who are not religious also believe in life after death, while others believe that there is no existence after death.

Ways of thinking about life after death include: reincarnation, resurrection, rebirth, immortality,

# Year 9 Science

## Science Topic 1 – Architect module (KS3 revision)- please note this is a synoptic revision module and covers

### Topic 1 – Key takeaways:

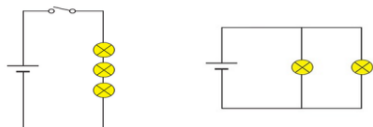
- Any scientific investigation has to have an independent, dependant and control variables
- Buildings can pollute the environment – the water, ground and the air
- Buildings lose thermal energy which costs money in heating bills
- Buildings can be insulated in a number of ways to preserve their warmth and keep the cost of bills down
- Buildings have many types of electrical circuits in them

Topic key vocabulary:  
Independent variable  
Dependent variable  
Control variable  
pollution  
Insulation  
Circuits



### Starter

1. What are the differences in these two circuits?
2. How do you think these differences affect the current and potential difference in these circuits?



Scan the code to go to the BBC bitesize site:



### Key questions

How do houses lose heat and what can be done to insulate them effectively?  
How are bulbs in a house wired in a circuit?

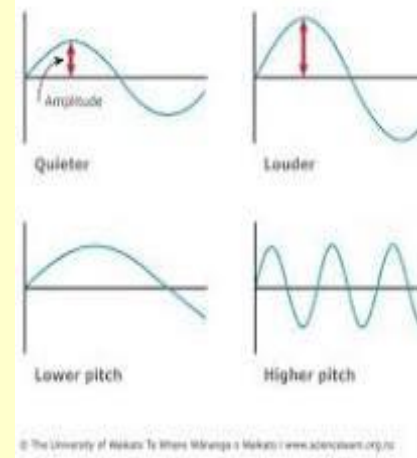
## Science Topic 2 – Teacher module (KS3 revision) please note this is a synoptic revision module and covers several topics

### Topic 2 – Key takeaways:

- The main food groups are carbohydrates, proteins and fats. Why we need them in our diet and how to test for them
- The Earths consists of a core, a mantle and a crust
- Your body gets energy mainly from aerobic respiration but can use anaerobic respiration as well
- That sound travels as a longitudinal wave which is different to light which is a transverse wave
- The shape and size of a sound wave change when a sound does
- Sound travels at different speeds in solids , liquids and gases

Topic key vocabulary  
Carbohydrates  
Starch  
Glucose  
Fat  
Protein  
aerobic respiration:  
Anaerobic respiration  
Core, mantle  
crust,  
Amplitude,  
frequency

Scan the code to go to the BBC bitesize site:



Key Questions : What are the main food groups and how do you test for them?  
What is difference between aerobic and anaerobic respiration?  
How does a sound wave change when a sound changes?

# Year 9 Wellbeing

## Mindfulness and Meditation can help most people at times!

Our 'everyday mind' can end up full of worries about things which are no longer true or happening or fretting about what MIGHT happen in the future – even though we know it may not! The idea is that we are more than these conscious thoughts.

Challenging things happen, we cannot avoid that, but what we think about those challenges is very much up to us

To worry and repeatedly think about difficult things can become suffering - a habit it is all too easy to fall in. The good news however is that we can avoid it! How?

When we notice that we are worrying about things - playing through possible futures like a film in our heads or imagining something going wrong, or even remembering difficult things, unpleasant experiences, **we can simply choose to bring ourselves back to the present moment, by thinking about our breathing.**

This practice comes with lots of benefits...

## How to Practice Mindfulness

- 1 Take a seat.** Find a place to sit that feels calm and quiet to you.
- 2 Set a time limit.** If you're just beginning, it can help to choose a short time, such as 5 or 10 minutes.
- 3 Notice your body.** You can sit or kneel however is comfortable for you. Just make sure you are stable and in a position, you can stay in for a while.
- 4 Feel your breath.** Follow the sensation of your breath as it goes out and as it goes in.
- 5 Notice when your mind has wandered.** When you get around to noticing this—in a few seconds, a minute, five minutes—simply return your attention to the breath.
- 6 Be kind to your wandering mind.** Don't judge yourself or obsess over the content of the thoughts you find yourself lost in. Just come back.



## The Benefits of Meditation for Students

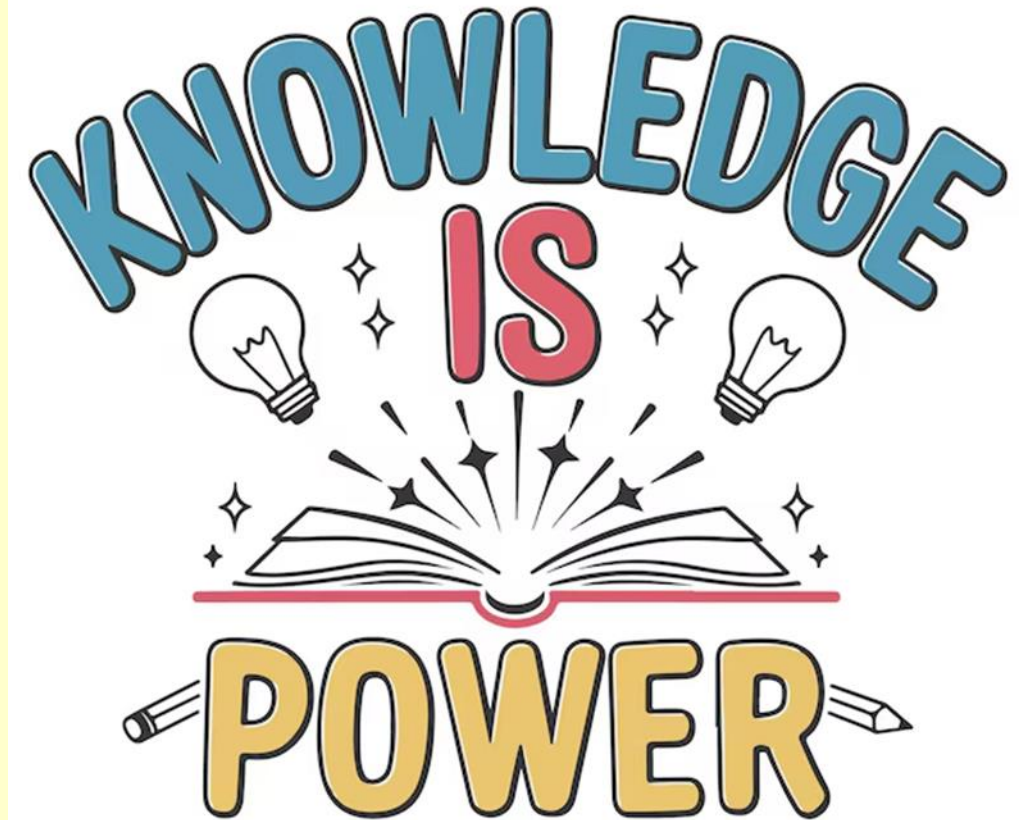


I know it seems way too simple! But this is an ancient practice with traditions in all major religions – including Islam and Christianity! I know that it will seem odd at first. That is your worrying mind trying to stop you taking control over it! But stick with it – it will help! Regularly practicing will really help!

If you are struggling with worries regularly you might want to get some support – you can start with Kooth – go to their website and sign up – it is easy, and they will help! If you need help on a specific aspect of Mental Health you can always start at the excellent FYI website here: <https://www.fyiorfolk.nhs.uk/> - it costs nothing to sign up and get help!

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Organiser

Spring Term  
2



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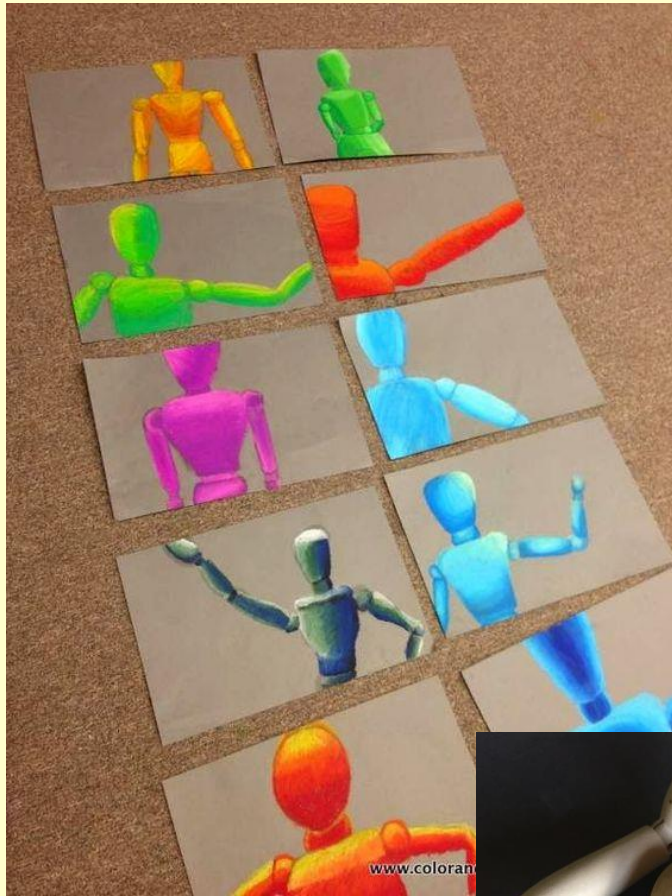
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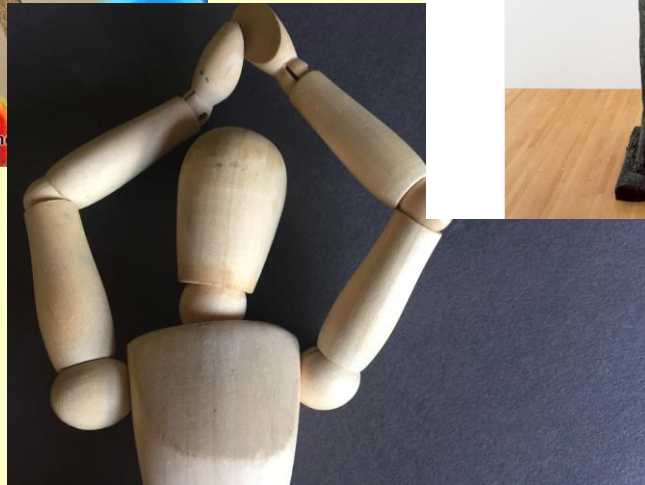
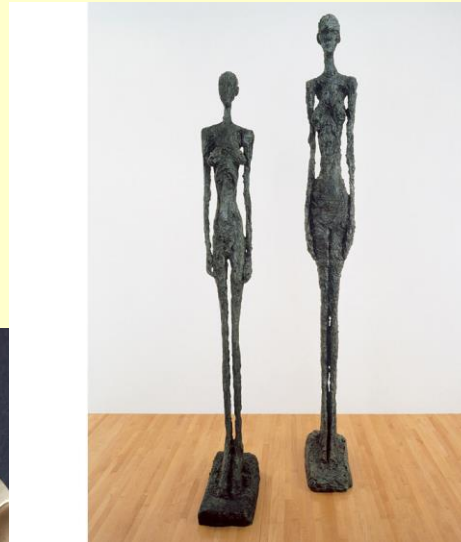
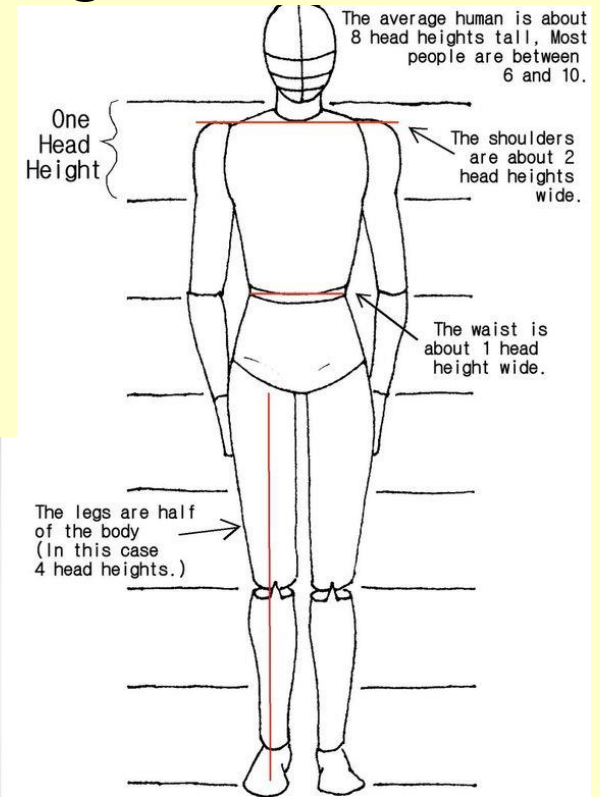
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# Year 9 Art – Topic: Human Figure



Year 9 are looking at the Human Figure this term and making drawings from the wooden mannequins.

Students are studying proportion and how to Apply tone to show 3D form on the figures



Make a drawing of this figure using pencil tone

We are learning about the figure artist Giacometti this term. He produces tall thin sculptures of people that show how it feels to be human. Specifically, they show the vulnerability and fragility of human life.

If working from home, can you make drawings of these figures using pen, pencil and ink.

# Year 9 Computer Science – Data representation

## Topic 1 – Key takeaways:

- LANs connect computers in a small area, like a school, to share resources.
- Servers provide centralised services, such as file storage and internet access, for networks.
- The internet connects millions of networks worldwide using routers and servers.
- Data is sent over the internet in small packets to ensure reliability.
- Binary is the base-2 number system used by computers to represent data.
- Binary addition is used in computer calculations, such as arithmetic and logic operations.
- Hexadecimal (base-16) is a compact way of representing binary data in programming.
- It is commonly used for memory addressing and colour codes in web design.

Hex	Decimal
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

## Hexadecimal to Decimal

Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Convert 2c9b to decimal

$$(2 \times 16^3) + (12 \times 16^2) + (9 \times 16^1) + (11 \times 16^0)$$

$$8192 + 3072 + 144 + 11$$

$$11419$$

$$\therefore (2c9b)_{16} = (11419)_{10}$$



## Binary to Decimal

$2^{10}$	$2^9$	$2^8$	$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
1024	512	256	128	64	32	16	8	4	2	1

				1	0	1	1	0	0	1
--	--	--	--	---	---	---	---	---	---	---

$$1011001_2 = 1 \times 64 + 1 \times 16 + 1 \times 8 + 1 \times 1 = 89$$

Topic key vocabulary:  
Hexadecimal  
Binary  
Base  
Router  
LAN  
WAN  
PAN  
Server  
WWW

Key Questions: What is the main difference between a LAN and a WAN?  
How does a router help connect devices to the internet?  
How would you add the binary numbers 1011 and 1101?  
Why do programmers prefer using hexadecimal over binary?

# Year 9 Design and Technology – Topic: Screen Printing



## Word Bank

Stencil  
Grayson Perry  
Craft Knife  
Shape  
Composition  
Blocking  
Detail  
Screen Printing  
Squeegee  
Colour Mixing



These are the key principles of design we will be looking at this term when producing a screen printed sample in the style of Grayson Perry.

## Exam Style Questions?

- Which practical skills will you use when making your stencils?
- What are the key Health and Safety considerations when using a craft knife to make your stencils?
- How will you think hard about colour mixing and shape to make sure your print is as successful as possible?
- What refinements will you make to your stencil through trial and error to continuously improve your stencil?

## Grayson Perry – Fact File

### **Full Name:**

Grayson Perry

### **Born:**

March 24, 1960

### **Place of Birth:**

Chelmsford, Essex, England

### **Occupation:**

Artist, Sculptor, Writer, Broadcaster

### **Known For:**

- Ceramics (particularly large, often narrative-driven pots and vases)
- Publicly addressing identity, gender, and social issues through his artwork
- His alter ego, "Claire," an embodiment of his female persona

## How to Screen Print:

1. Tape your stencil upside down on the front of the silk screen, covering all of the areas you don't want paint to go through.
2. Place your fabric flat on the table and position the screen on top.
3. Mix your paint ratio 3:1 paint to printing medium and mix well until smooth.
4. Apply in a line to at the top of the screen. Use the squeegee to pull the paint through the screen 3 times, the bang off the excess and do a dry pull. Make sure someone is holding the screen down!
5. Lift the screen off carefully and repeat the desired amount of times.
6. Strip and wash the screen and leave the printed fabric to dry. You should see light through the screen when it is clean.

## Useful Links

<https://www.youtube.com/watch?v=xCINKXM1pao>

<https://www.channel4.com/programmes/graysons-art-club>

<https://www.royalacademy.org.uk/art-artists/name/grayson-perry-ra>





# Year 9 Drama – Topic: Devising

**Devising** is working collaboratively to create original drama.

The devising process will start with a **stimulus** – something which stimulates or gives you ideas to create drama about.

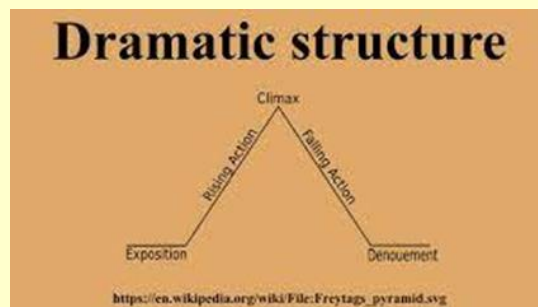
You will then need to do **research** to get more ideas about what to include in your performance.

Devised theatre is often built around a **theme** or issue that the drama is built around.

You will need to work **collaboratively** with a variety of people in your group so that you can get a variety of ideas.

You will need to be brave and be able to **experiment** with ideas, you are unlikely to have the perfect idea straight away.

When devising you will need to keep your **creative intentions** in mind, what are you trying to show the audience?



## Key Vocab

**Exposition** – gives the background information about the characters and where the story is set.

**Rising action** – this is where a complication is added, and the tensions rises.

**Climax** – This is the highest point of tension the moment where the audience holds their breath.

**Falling Action** – Starts to explain the results of the complication, the audience can start to relax again.

**Denouement or resolution** – this is the conclusion and lets the audience know the final messages.

Theatre companies who perform devised performances:

**Complicite** uses extreme movement and surrealist imagery.

Their work combines text, music, images and action to create surprising and disruptive theatre. The company are famous for long research and development periods and they bring together performers, designers, writers, artists and specialists.

<https://www.complicite.org/>

**The Paper Birds** are a devising theatre company with a social and political agenda. These means they create drama which raises awareness about issues in today's world.

They work using **verbatim theatre** meaning they uses the words of real people without changing them.

<https://www.thepaperbirds.com/>

# Year 9 English – An Inspector Calls

## Plot summary

An Inspector Calls is set within the drawing room of a privileged British family. Their happy celebrations for a recent engagement will be interrupted by the arrival of the Inspector, who will interrogate them individually about their involvement in the death of a young, working-class woman. Each character is confronted with the consequences of their choices, some refusing to change their ways, while others show glimpses of reform. Priestley's drama invites the audience to consider our responsibility to look after one another and the role of the wealthiest classes in supporting the poor.



## Key characters and research prompts:

**The Inspector** – Priestley's mouthpiece, The Inspector examines the Birling family, revealing their roles in the death of a young woman. He forces the Birlings to consider their priorities.

**Research links between the Inspector and the author Priestley.**

**Mr Birling** – An embodiment of Capitalist Britain, Mr Birling is a man who has forgotten his roots and become obsessed by money.

**Research articles about social responsibility in 2025. Who might be a modern Mr Birling?**

**Sheila Birling** – Initially a childish figure, she steps out of her parents influence and recognises her wider responsibilities.

**Research young people who have made social change.**

## Links – Marxism

In Year 7 and Year 8 we read through the view of Marxism as we studied Lord of the Flies and Animal Farm. This asks us to consider how society is arranged into social classes and also how these different groups interact with each other. Marxism questions the chances of character's progressing through the hierarchy.

**Where do Priestley's sympathies lie in the drama?**

**How would we consider the relationship between the upper and lower classes in the drama?**

## Context

An Inspector Calls was written in the 1940s but is set in 1912. Its context matters greatly as the audience is asked to consider how much society has changed or remained the same in that time. It still speaks to an audience today, because many of the issues explored still exist.

Throughout the play, there are questions about the role of women in society, what role government and the wealthiest classes should play in looking after the poor and the potential consequences to individuals and society as a whole if it does not reform and start protecting its most vulnerable.

## Links

Our novels, To Kill and Mockingbird and Roll of Thunder, Hear My Cry both present situations where people are made outsiders and mistreat others. Think back to our work on psychoanalysis. What motivates people or drives them to do this?

**Tip: Consider this in your written work and why Priestley is making this point. What might he be saying to his audience?**

# Year 9 English – An Inspector Calls

## Study skills for this course:

What makes great analysis – a wide understanding of a text and an ability to draw upon a range of relevant evidence. However, it can be difficult to keep track of key quotations and references as we read.

1. Mindmap different characters with their key quotations as we go through the drama. Draw on these even when asked about a specific moment in the play.
2. Consider different contexts. How might someone respond differently or the same today?

## Example Progress Folder Tasks

How does Priestley characterise Mr Birling in the opening act of the play?

Write a diary entry from the perspective of Eva Smith detailing her experiences.

Explore the theme of social responsibility in the drama. How does the character of Sheila show the Inspector's optimism for the younger generation?

## Success Criteria

Analysis tasks require you to make sure you have specific ingredients in your answer. By Spring in Year 9, you will be familiar with these and need to develop them further.

**Thesis Statements** – Include an introduction that shows the 'golden idea' you're going to explore.

**Evidence** – Try to find more than one piece of evidence that supports your point. These should be relevant.

**Context** – What has motivated Priestley to make this choice?

## Ambitious Vocabulary

**Altruism** – Showing concern for the well-being of others.

**Capitalism** – An ideology that prioritises individual wealth.

**Cynical** – Doubtful of others' motives or actions.

**Exploitation** – Taking unfair advantage of others for personal gain.

**Hypocrisy** – Pretending to have beliefs or views that one doesn't actually have.

**Imperialistic** – The desire to extend control or influence. Also a policy of building an empire or taking over other land.

**Morality** – The distinction between right and wrong.

**Ominous** – Suggesting that something bad is about to happen.

**Prejudiced** – Unfair judgement or views of others. Linked to biased views of others.

**Subversive** – Intending to undermine or overthrow existing policies or actions.

## Dramatic / Linguistic Vocabulary

**Allegory** – A story with a moral message beneath the surface.

**Characterisation** – A method of giving a character a personality through their words, actions and relationships.

**Dramatic Irony** – The audience knows something the character doesn't.

**Foreshadowing** – A hint of something that will become more significant as the story progresses.

**Stage Directions** – Instructions written by the playwright telling actors and directors how something should be staged.

**Symbolism** – Objects, names and settings representing something broader.

**Tip: Use the ambitious vocabulary in your answers and the dramatic vocabulary to identify the methods the author is using.**

# Year 9 Food Technology – Topic: Nutrients

## Nutrients

Macro nutrients – Needed in large quantities in the diet

1. Protein
2. Fats
3. Carbohydrates

Micronutrients – needed in small quantities in the diet

1. Vitamins
2. Minerals

## Protein

### Food sources

Animal –beef, pork, lamb, poultry (chicken, turkey, duck), fish, cheese, butter milk

Plant – beans, chickpeas, lentils, peas, nuts, seeds, found in smaller amounts in some vegetables such as spinach and broccoli.

### Function

Grown and repair of muscles and cells

## Example exam questions

What is the function of sugary and starchy carbohydrates? (2 marks)

Why is protein especially important for children? (2 marks)

What are the functions of fat? (3 marks)

List 5 food sources of plant-based protein (5 marks)

What is the macro nutrient found in the following ingredients – butter, sugar, flour, egg? (4 marks)

## Fat

There are two types of fat, saturated and non-saturated.

Saturated fats are classed as ‘unhealthy fats’, they are solid at room temperature and are generally animal based.

Unsaturated fats are classed as ‘healthier fats’ and are liquid or soft at room temperature and come from plant-based sources.

### Function

Keeps us warm (provides insulation), secondary source of energy, protects vital organs and bones.

### Food sources

Animal –beef, chicken skin, processed meat (sausages, salami, pepperoni), bacon, butter, cheese, full fat milk

Plant – vegetable oils (sunflower, olive, rapeseed), avocado, nuts, seeds

## Carbohydrates

There are two types of carbohydrates, complex and simple. They are also known as starchy (complex) and sugary (simple).

### Function

Starchy/complex carbohydrates are digested slowly and provide long term energy.

Sugary/simple carbohydrates are digested slowly and provide short term energy

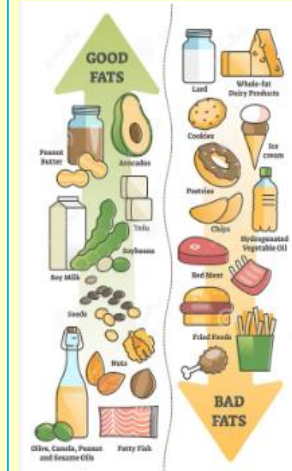
### Food sources

Starchy – bread, rice, pasta, potatoes, bagels, oats, flour, cereal and some vegetables.

Simple – fruit, some vegetables, sugar, honey, syrup, sweets, fizzy drinks

## Key Vocabulary

Macro nutrients  
Micronutrients  
Protein  
Fats  
Carbohydrates  
Vitamins  
Minerals  
Function  
Sources  
Types  
Saturated  
Unsaturated  
Plant based  
Animal Based



## Complex & Simple Carbohydrates

Simple Carbohydrates



Complex Carbohydrates



# Year 9 Geography – Topic: Weather and Climate

**Climate** is what you expect, weather is what you get

## Weather

“If you don't like the weather, just wait a few minutes” Mark Twain

Weather is **constantly changing**, it affects our everyday activities such as school, farming, sport and recreation. There are many examples of weather extremes.

## Climate

A **long term pattern** of weather in an area. This can link to global biomes, determining the types of plants and animals that are found in an area.

## Air pressure

As warm air rises it creates areas of **low atmospheric pressure** in the lower atmosphere.

Conversely as cool air is more 'dense' than warmer air, it sinks, this creates areas with **high pressure** in the lower atmosphere.

## Climate zones

The further away from the north and south pole you travel towards the equator, the hotter it becomes. Bands of climate zones roughly follow the lines of **latitude** but oceans and mountains disrupt these.

'**Biomes**' such as deserts, rainforests, grasslands and tundra are created where climate conditions are similar.

**Climate zones** share similar temperatures and rainfall amounts.

## Types of rainfall

### Relief

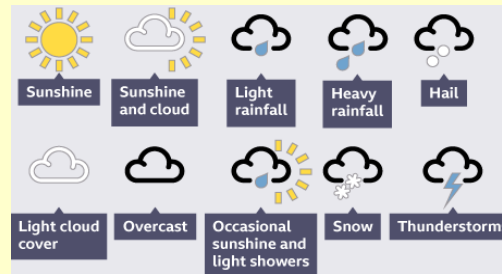
Air containing water vapour is blown towards hills and mountains, is forced upwards by higher land, rising air cools until water droplets form (**condense**), creating rain on **windward** sides of mountains and dry areas on the **leeward**.

### Convection

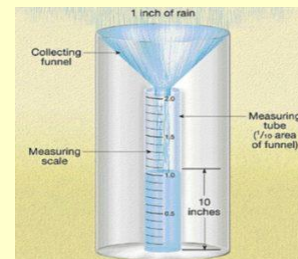
As land is heated in summertime, it may release large amounts of trapped water vapour to rise, cool, **condense** and form towering cumulus/cumulonimbus thunder clouds.

### Frontal

As warm air and cold air masses meet they sink/over-ride each other creating rising air and weather '**fronts**'.



## Forecasting weather



Weather can be **forecast** and recorded using instruments such as an **anemometer** (wind gauge), weather balloons, ships, satellites etc.

Trends in weather can be recorded and used to make future predictions.

Extreme weather however is still very difficult to fully predict. The 'beast from the east' was an extreme snowfall event in 2018, in 1987 a great storm event occurred in south-east and eastern England, with hurricane strength winds.

## Key Vocabulary

Relief  
Convection  
Air pressure  
Biomes  
Precipitation  
Condensation  
Evaporation  
Weather fronts  
Forecast  
Weather data  
Extreme weather  
Rain Gauge  
Cumulus  
Barometer  
Air mass  
Thermometer  
Arid  
Humid  
Anti-cyclone  
Depression  
Meteorologists  
Climate Change  
Heatwave  
Flooding  
Jetstream  
ITCZ

# Year 9 German – Topic: Ambitions 2/Childhood

## Was möchtest du machen? What would you like to do?

Ich möchte ...	I would like ...
zuerst	first of all
später	later
dann	then
bei (BMW) arbeiten	to work for (BMW)
heiraten	to get married
Kinder haben	to have children
um die Welt reisen	to travel round the world
Fußballprofi werden	to become a footballer
Schauspieler werden	to become an actor
Sänger(in) werden	to become a singer
auf die Uni gehen	to go to uni
(Mathe) studieren	to study (maths)
im Ausland leben	to live abroad

Click on the link below to hear the words in the purple box; [What would you like to do?](#)

Click on the link to practise some phrases

[Textivate](#)

Im Skiort	In the ski resort
das Café	café
das Restaurant	restaurant
das Hotel	hotel
die Skischule	ski school
das Souvenirgeschäft	souvenir shop
die Kinderkrippe	crèche
der Berg	mountain
die Piste	ski run
der Wellnessbereich	spa
Ich arbeite im Moment ...	At the moment I work ...
im Souvenirgeschäft	in the souvenir shop
als Küchenhilfe	as a kitchen help
Ich möchte später ...	Later I would like to ...
Sozialarbeiter(in) werden	become a social worker
ein Restaurant eröffnen	open a restaurant
Ich würde nie ...	I would never ...
in der Stadt leben	live in the city
auf dem Berg leben	live on the mountains

Click on the link below to hear the words in the pink box; [In the Ski Resort](#)

Click on the link below to hear the words in the green box:

[My Childhood](#)

**Meine Kindheit**      **My childhood**  
Mit fünf Jahren ...      When I was five years old .../At the age of five.....

hatte ich ein tolles Rad. I had a great bike.  
hatte ich einen roten VW. I had a red VW.  
hatte ich eine schöne Puppe.

I had a beautiful doll  
hatte ich einen niedlichen Teddybären  
I had a cute teddy.

hatte ich einen kleinen Computer  
I had a small computer.  
hatte ich einen bunten Fotoapparat.

I had a colourful camera.  
hatte ich einen blauen Gokart.  
I had a blue go-kart

hatte ich eine gelbe Tasche.  
I had a yellow bag.  
hatte ich eine tolle Eisenbahn.

I had a great train set.  
hatte ich ein weißes Jo-Jo.  
I had a white **yo-yo**

**.hatte ich ein altes Schaukelpferd.**  
**I had an old rocking horse.**  
**hatte ich viele Kuscheltiere.**

**I had lots of soft toys.**  
**Das war meine Lieblingssache.**  
**That was my favourite thing.**

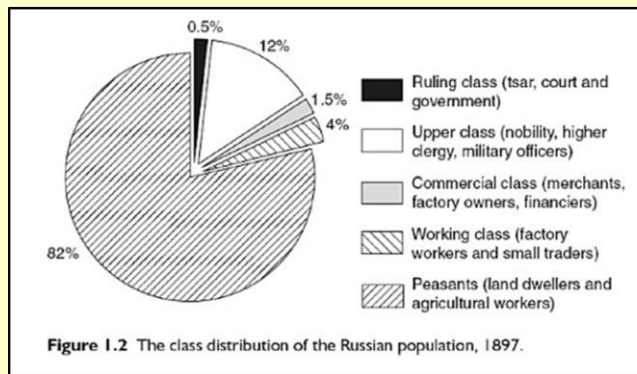
**Er/Sie/Es war super.**  
**It was super.**  
**Jetzt spiele ich lieber am Computer. Now I prefer to play on the computer.**

# Year 9 History – Topic: The Russian Revolution

## Key Vocabulary

- Autocrat
- Aristocrats
- Bolsheviks
- Hierarchy
- Lenin
- Nobility / Upper class
- Peasant / serf
- Rasputin
- Revolution
- Tsar
- Working class

1. Russian society was a hierarchy. The country was run by a small number of very rich, powerful people. The vast majority of the people were very poor peasants (also known as 'serfs').
2. The Tsar (king, or emperor) was called Tsar Nicholas II.



9. Despite a large amount of opposition in 1905, Tsar Nicholas II was able to survive and introduce only very limited changes.
10. However, in 1917 there were two revolutions in Russia that changed the country forever. are some of the key features of both.

- ### Example exam questions
1. Write a definition of the term 'Autocrat' [1 mark]
  2. Describe one feature of Russian society in the early 20th century [1 mark]
  3. Give two reasons why there was a revolution in 1905 [2 marks]
  4. Explain why there was a revolution in October 1917 [5 marks]

3. By 1905, the vast majority of Russia was still a backward country mostly based on farming.
4. Peasants worked hard and were often vulnerable to famine and disease.
5. However, they were very religious and very loyal to the Tsar of Russia.

6. In 1905 Russia had its first Revolution. Although the protesters mostly did not wish to overthrow the Tsar they did demand some changes.
7. The main causes of the revolution included:
  - A) Ongoing poverty and inequality in Russia, and as inflation, hunger and taxation increased, the peasants began to protest
  - B) The Russian army/navy were humiliated by the Japanese in the Russo-Japanese War from 1904 to 1905. People were angry and some blamed the Tsar.
8. Bloody Sunday was a protest in the capital city of St. Petersburg where the Tsar ordered his soldiers to shoot the protesters.

February 1917 Revolution	October 1917 Revolution
Caused by the Tsar's failure to end World War I despite its effects on the Russian people.	Caused by the Provisional Government's failure to end the war, despite promising they would.
Caused by increasing demands for democracy in Russia by many different political groups.	Caused by the actions of the Communists who wanted Russia to become a Communist country.
Caused by ongoing poverty and suffering in Russia.	Caused by ongoing poverty and suffering in Russia.
Led to the creation of a Provisional Government who planned to bring in free elections	Led to the replacement of the Provisional Government with a Communist government
Although they imprisoned much of their opposition, the Government eventually lost control and the Bolsheviks took power	Once in power, the Bolsheviks fought the Russian Civil War against those who wanted the Tsar to return. They won and remained in power. The Tsar and his family were murdered.

# Year 9 Maths - Unit 9 – Deduction

## What do I need to be able to do?

- Know and use basic angle facts
- Identify angles in parallel lines
- Solve multi-step angle problems
- Make conjectures with angles
- Make conjectures with shapes

## Vocabulary

- Angle:** the space between two lines  
**Conjecture:** a statement that might be true but is not proven yet  
**Counter-Example:** an example that disproves a statement  
**Equation:** a mathematical statement that says two things are equal  
**Interior angle:** the angle inside a shape  
**Parallel:** two straight lines that never meet and have the same gradient  
**Perpendicular:** two straight lines that meet at a right angle  
**Polygon:** a 2D shape made from only straight edges  
**Sum:** the result of adding two or more numbers  
**Transversal:** a line crossing two parallel lines

## Angle Facts



## Triangles



## Angles in Parallel Angles

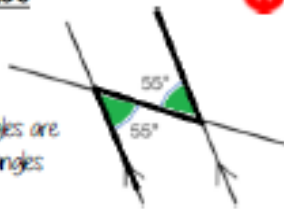


## Angles in Polygons



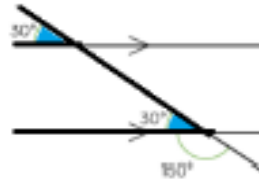
### Alternate angles

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



### Corresponding angles

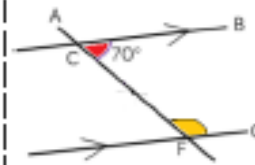
Because corresponding angles are equal the highlighted angles are the same size



### Co-interior angles

Because co-interior angles have a sum of  $180^\circ$  the highlighted angle is  $110^\circ$

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



### Solving angle problems

#### Angles on a straight line



Link angle facts to algebra



Form an equation

$$2x + 4x = 180^\circ$$

State the reason

The sum of angles on a straight line is  $180^\circ$

Solve

$$2x + 4x = 180^\circ$$

$$6x = 180^\circ$$

$$x = 30^\circ$$



Vertically opposite angles

Equal

Angles around a point

$360^\circ$



Triangles

Sum of angles is  $180^\circ$

Isosceles have the same base angles

Interior Angles

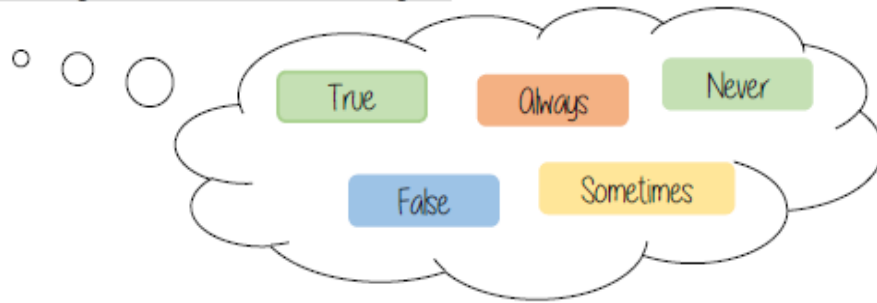
The angles enclosed by the polygon



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



## Making conjectures with angles



### Proving a conjecture

A pattern is noticed for many cases



Apply the angle rules

The sum of angles in a triangle is  $180^\circ$

Test the theory

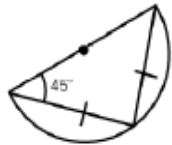
$$180 - 70 - 20 = 90$$

$$180 - 85 - 5 = 90$$

$$180 - 45 - 45 = 90$$

### Disproving a conjecture

Only one counterexample is needed to disprove a conjecture



Make conjecture

The angle that meets the circumference in a semi circle is  $90^\circ$

## Making conjectures with shapes

Keywords and facts to recall with shape

Area: the amount of space inside a shape

Perimeter: the length around a shape

Regular Polygons: All sides and angles are equal

Quadrilateral Facts



**Square**

All sides equal size  
All angles  $90^\circ$   
Opposite sides are parallel



**Rectangle**

All angles  $90^\circ$   
Opposite sides are parallel



**Rhombus**

All sides equal size  
Opposite angles are equal



**Parallelogram**

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



**Kite**

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

Types of Quadrilateral



Angles in Quadrilaterals



Polygons



A surveyor uses mathematical calculations, like elevations, shapes and dimensions with tools and equipment to take measurements of land for private, government and public developments. Other job duties include visiting various job sites to take measurements, measuring angles and distances on different properties to determine legal construction boundaries, using calculations to confirm measurements and analysing data found on maps, charts, software systems and plans.

A surveyor



# Year 9 Maths - Unit 10 – Rotation and Translation

## What do I need to be able to do?

- Identify the order of rotational symmetry
- Rotate a shape about a point
- Translate a shape given instructions in words
- Translate a shape using vectors.
- Compare rotations and reflections

## Vocabulary

- Horizontal:** from side to side  
**Invariant:** a point that does not move after transformation  
**Origin:** the coordinates (0,0) where the two axes meet  
**Regular:** a regular shape has angles and sides of equal lengths  
**Rotate:** a rotation is a circular movement  
**Symmetry:** when two or more parts are identical after a transformation  
**Translation:** the movement of a shape  
**Vertex:** a point where two edges meet  
**Vertical :** from up to down

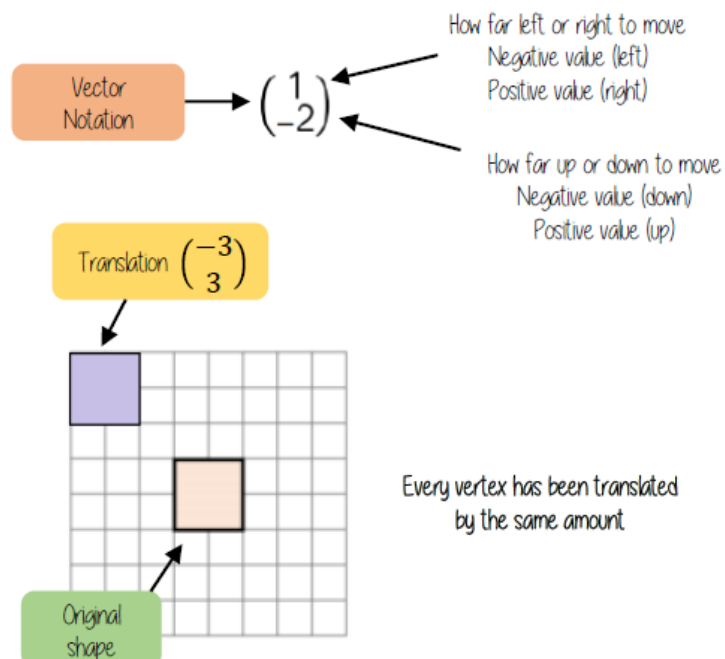
### Translations



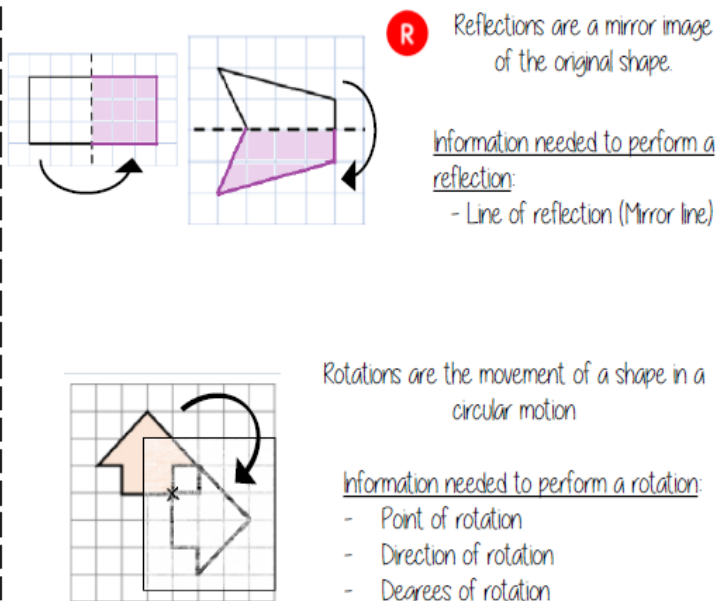
### Rotations



## Translation and vector notation



## Compare rotations and reflections



### Reflections

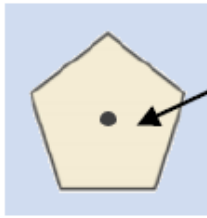


### Rotational Symmetry



## Rotational Symmetry

Tracing paper helps check rotational symmetry.



1 Trace your shape (mark the centre point)

2 Rotate your tracing paper on top of the original through  $360^\circ$

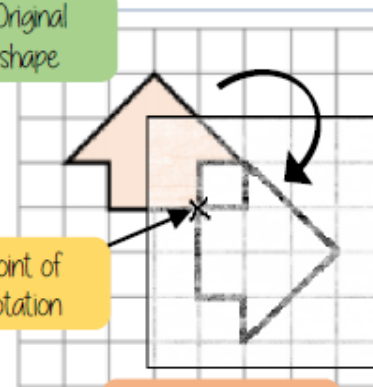
3. Count the times it fits back into itself



A regular pentagon has rotational symmetry of order 5

## Rotate from a point (in a shape)

Original shape



Point of rotation

Image:  $90^\circ$  clockwise

1 Trace the original shape (mark the point of rotation)

2 Keep the point in the same place and turn the tracing paper

3. Draw the new shape



Clockwise

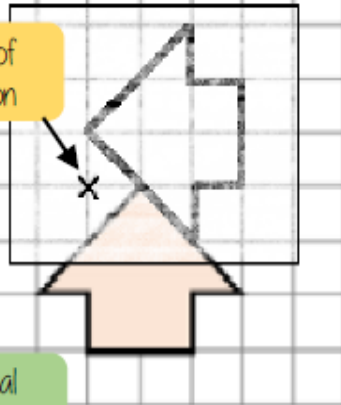


Anti-Clockwise

## Rotate from a point (outside a shape)

Image:  $90^\circ$  anti-clockwise

Point of rotation



Original shape

1 Trace the original shape (mark the point of rotation)

2 Keep the point in the same place and turn the tracing paper

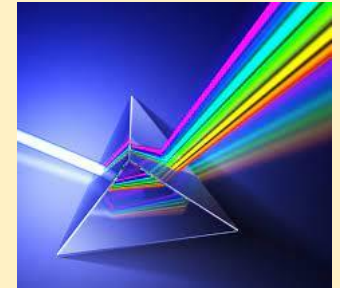
3. Draw the new shape

A job involving geometry:

### An Optical Physicist

**Optical physicists** have developed products that reflect light rays to enhance the luminosity of objects, such as road signs and light sources.

They design surfaces covered with microscopic structures—tiny bumps, ridges, indentations, and furrows—that bend and reflect light. Optical physicists use their knowledge of geometry to determine the angle that light is reflected off a microstructure or the angle that light is bent when it passes through the structure.



# Year 9 Maths - Unit 11 – Pythagoras' Theorem

## What do I need to be able to do?

- Use square and cube roots
- Identify the hypotenuse
- Calculate the hypotenuse
- Find a missing side in a right angled triangle
- Use Pythagoras' Theorem on axes
- Explore proofs of Pythagoras' Theorem

## Vocabulary

**Adjacent:** the side next to the angle of interest

**Formula:** a mathematical sentence linking different algebraic variables

**Hypotenuse:** the largest side on a right angled triangle, found opposite the right angle

**Perpendicular:** two lines that meet at a right angle

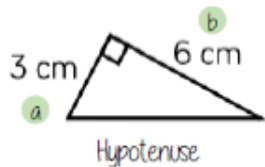
**Opposite:** the side across the triangle from the angle of interest

**Right angle:** a 90 degree angle marked with a square

**Square Number:** the output of a number multiplied by itself

**Square Root:** a value that can be multiplied by itself to give a number

### Calculate the hypotenuse



Either of the short sides can be labelled a or b

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

1 Substitute in the values for a and b

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

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

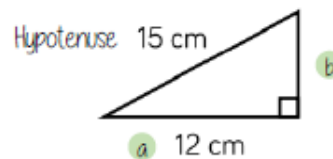
$$45 = \text{hypotenuse}^2$$

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

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

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

### Calculate missing sides



Either of the short sides can be labelled a or b

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

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

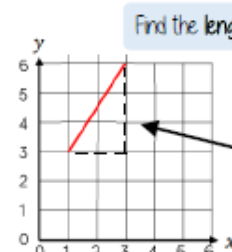
1 Substitute in the values you are given

$$144 + b^2 = 225$$

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

$$\begin{aligned} \text{Square root to find the length of the side} \quad & \left\{ \begin{aligned} b^2 &= 111 \\ b &= \sqrt{111} = 10.54 \text{ cm} \end{aligned} \right. \end{aligned}$$

### Pythagoras' theorem on a coordinate axis



Find the length of the line segment

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

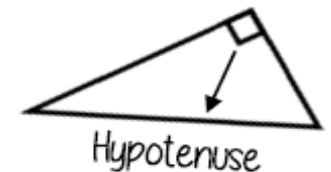
The line segment is the hypotenuse

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

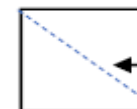
The lengths of a and b are the sides of the triangle.

Be careful to check the scale on the axes

### Identify the hypotenuse



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



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

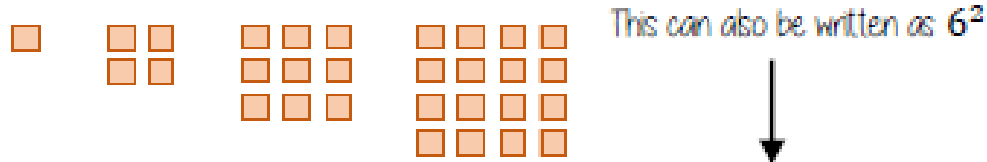
# Squares and square roots



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

eg  $\sqrt{64} = 8$

Because  $8 \times 8 = 64$



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

Square numbers

Square Numbers



Square Roots



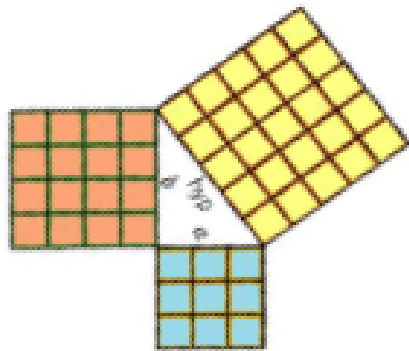
Pythagoras' Theorem



3D Pythagoras'



## Determine if a triangle is right-angled



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

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

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

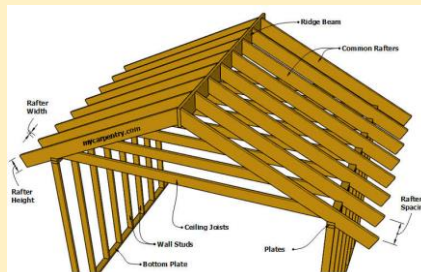
$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25$$

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

A job involving Pythagoras:

Construction



Pythagoras' is frequently used in architecture, woodworking, or other physical construction projects. For instance, say you are building a sloped roof. If you know the height of the roof and the length for it to cover, you can use the Pythagorean Theorem to find the diagonal length of the roof's slope. You can use this information to cut properly sized beams to support the roof or calculate the area of the roof that you would need to shingle.

# Year 9 Physical Education – Topic - Rugby



## Key skills

### Passing & Use of Space

Is being able to accurately replicate prior learnt types of passes and performing these in a game to retain ball possession & outwit opposition. Also understanding what the use of space means for attacking opportunities.

### Outwitting opponents - 5 vs 3

Is developing knowledge and understanding of strategic play used to outwit opponents. This means developing and refining tactics based on the analysis of opposition. This also means to begin to correctly officiate.

### Tackling & Rucking

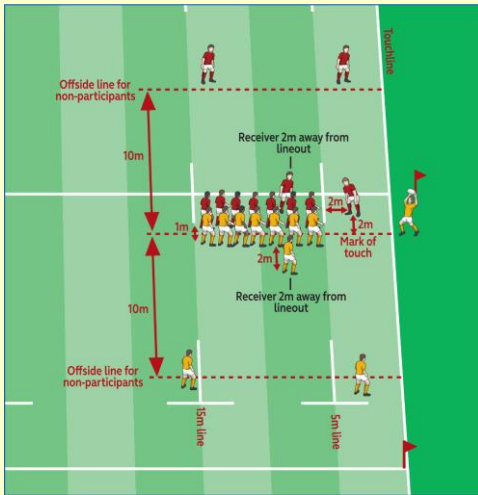
Is developing an understanding & knowledge of how to perform a ruck and to replicate the correct tackling & rucking technique. This includes understanding the safety aspects of tackling and the rules regarding rucking and offside.

### Restarting play - Line Outs

Is being able to perform a small line out with the correct technique and understanding how a line out is formed with the necessary positions.

### Scrum development

Is developing the knowledge & understanding of how to form a 3-man scrum, understanding and accurately describing the scrum positions and to develop knowledge of when a scrum is used. Then integrating scrummage skills into a small sided game after an infringement.



## Scrum

A scrum will be awarded for:

a forward pass, a knock on, where the ball does not emerge from a maul or ruck; or when the ball becomes unplayable.

The referee will call “Crouch” and then “Bind”. The front rows crouch and using their outside arm each prop must bind onto the body or side of their opponent and the second rows crouch and bind onto the prop in front of them.

Following a pause, the referee calls “Set” only when the front rows are ready. The front rows may then engage.

## Key Vocabulary

- Backwards
- Conversion
- Line Out
- Offside
- Outwit
- Pass
- Penalty
- Possession
- Ruck
- Scrum
- Tackle
- Tactical

## Rules of The Game



# Year 9 Physical Education – Topic - Cheerleading

## Skills

I can perform in the role of base (holds the flyer), support (helps flyer get in and out of position) or flyer (person who is held up)

I can perform low level stunts, eg. thigh stand, modified prep and load

I can use transitions to link stunts together, entries and dismounts must link smooth and flow

I can use jumps (straight, star, tuck, pike, straddle) and tumblers in the routine to improve the dynamics and as transitions

I can use choreographical techniques such as cannon, unison, mirroring and formation

I can learn a short dance piece to be included in the routine

## Health and Fitness

I can warm up effectively in preparation for cheerleading (pulse raiser, mobilisation and preparation stretches)

I can identify the different components of fitness required to perform well in cheerleading.

I can identify ways in which I could improve these components of fitness.

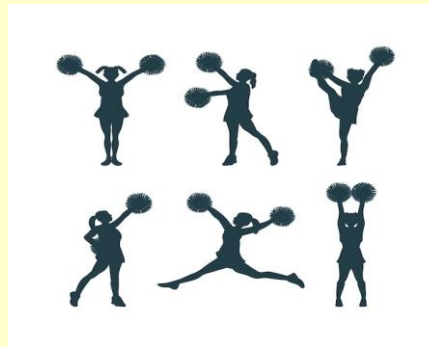
## Choreography

I can critically evaluate my own and other performances and give feedback to help improve work.

I can use technical language in planning routines and performances.

I can work with my group to plan a routine

I can put my choreography to music



## Leadership

I bring correct kit for PE

I show willingness to improve by actively engaging in each lesson as either a base, support or flyer

I can successfully coach as part of small group.

I can identify strengths and weaknesses in my own and others performance.



## Key Vocabulary

Body tension and extension  
Control  
Base, support, flyer  
Transitions  
Stunts  
Unison, cannon, mirroring  
Tumble  
Jump

## Rules

Remove all jewellery, tie back long hair and have bare feet or grip socks

Perform as a base, support or flyer

Hold balances for 3 seconds

All routines should have a clear start and finish

Always perform agilities on a mat

Always have good tension, extension, and control

# Year 9 - Physical Education – Topic - Health Related Fitness

## Continuous training

This type of training involves a steady but regular pace at a moderate intensity which should last for at least 30 minutes. Activities can include running, walking, rowing or cycling.



## Fartlek training

This means **Speed Play** in Swedish. It is a combination of different intensities. *i.e. 30 seconds Sprinting, 30 seconds walking, 30 seconds jogging.* There is NO rest in fartlek training.



## Free weights/resistance machines

Free weights and resistance machines can be used to improve a muscle's endurance capacity. To improve endurance, you must have high repetitions low weight. To improve muscular strength, it must be low repetitions and high weight.



## Circuit training

Circuit training is a series of exercises completed one after another. It is a very good way of developing strength and muscular endurance people training is usually done with a group of people, and you rotate after 30 seconds of an exercise. Circuit training may have rest periods, but it is usually high intensity and uses a range of muscles in the body.

## Interval training

This training involves periods of work followed by periods of rest. This training is like fartlek but in interval training you must have rest. For example: You might run for 2 minutes and then rest for 1 minute.



## SAQ (Speed, Agility, Quickness)

This training involves exercises that change direction quickly. Rapid energetic movements over a short distance are designed to replicate specific actions from sports such as rugby, basketball and football.



## Static active/static passive/PNF Stretching

**Static Passive stretching:** This requires the help of an external force, such as a partner, gravity or a wall causing the muscle to stretch.

**Static Active stretching:** The performer applies internal force on a joint, pushing it beyond its point of resistance (lengthening the muscles)

**PNF (proprioceptive neuromuscular facilitation)** is where the muscle is contracted isometrically for a period of at least 10 seconds. It is then relaxed and stretched again, usually going further the second time.

## Plyometrics

**Plyometrics** training refers to any exercise that enables the muscle to reach maximal force in the fastest possible time.



## Key Vocabulary

Continuous  
Fartlek  
Free weights  
Resistance  
Circuit  
Speed  
Agility  
Plyometrics  
Interval



# Year 9 Physical Education – Topic: Pickleball

## Scoring:

First Number score of the serving team

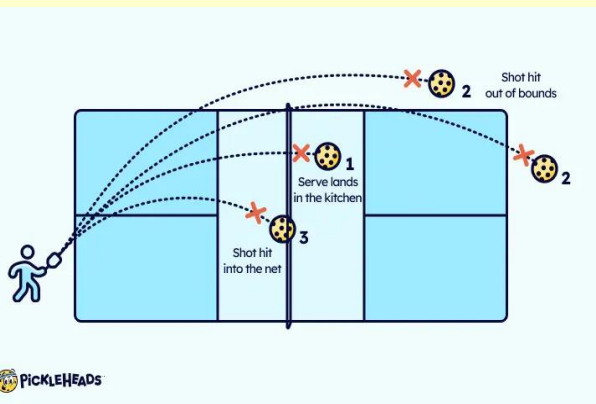
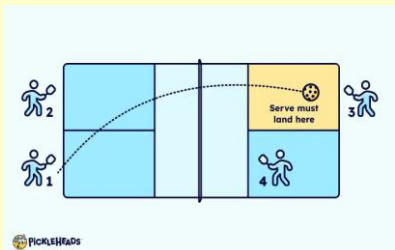
Second Number score of the receiving team

Third Number which player of the team is serving, first server (1) or second server (2)

**3 - 3 - 1**

Serving team's score    Receiving team's score    Current server (will be 1 or 2)

## Serving and faults:



## Shots:

### Dinks

Played closer to the net, these touch shots are hit into your opponent's kitchen and help keep the other team from attacking.



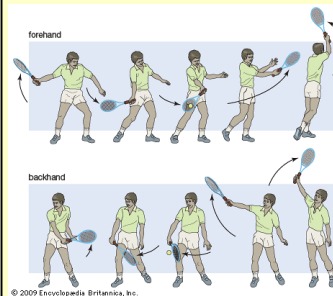
### Drop Shots

Played at the back of the court, these shots aim to land in the opponent's kitchen to keep them from attacking.



### Forehand/ backhand Drives

These powerful shots are hit off the bounce, often from the baseline. They are played using a forehand or backhand swing.



### Volleys

These shots are hit out of the air before the ball bounces. They can only be played outside the kitchen.



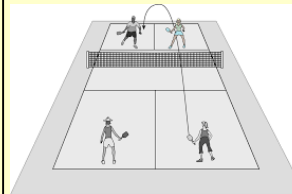
### Smash

The overhead smash is designed for one thing and one thing only: to destroy the ball and make it impossible for your opponents to return it.



### Lobs

These shots are hit high into the air to move opponents away from the kitchen.

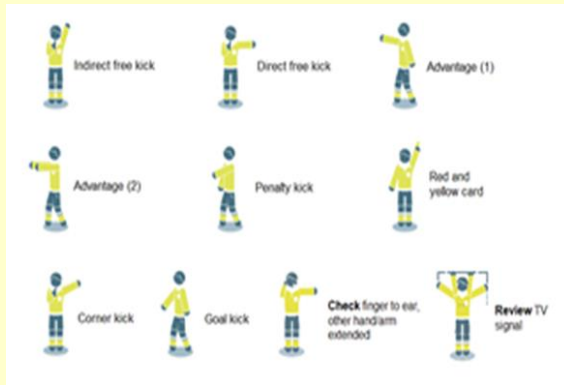


## Key words:

- Score
- Serve
- Dink
- Drop shot
- Volley
- Forehand
- Backhand
- Lob
- Smash
- overhead



# Year 9 Physical Education – Topic: Football



## Officiating in Football

Each match is controlled by a referee who has full authority to enforce the Laws of the Game in connection with the match.

The officials must be respected at all times.

Their role is to give free kicks, whether to award a goal, give yellow or red cards for fouls/decent and the result of the match.

### PLAY ADVANTAGE

Allows play to continue when an offence occurs, and the non-offending team will benefit from the advantage and penalises the offence if the anticipated advantage does not ensue at that time or within a few seconds

Referee signals (SEE Above)

## Key skills

**Passing** - To understand the benefits of passing and where different types of passes should be used i.e. Over defensive line. To be able to outwit opponents with a variety of passes.

**Control & Turning** - To be able to use the different parts of the body to control the ball. To perform and replicate different types of dribbling with control, speed and fluency in a pressured situation. To outwit opponents with the combination of advanced turns and dribbles making decisions about how best to advance on opposition.

**Attack/Beating an opponent** - To be able to outwit opponents using dummies & fakes at speed. To understand the importance of width and playing into space in order to attack. To develop strategic and tactical play.

**Shooting** - To perform a variety of shooting techniques on goal. i.e. low drive, chip and volley. To develop their understanding and knowledge of how to execute a successful shot on goal i.e. success criteria. To appreciate how to adjust shot selection based on opponents positioning.

**Defensive Tactics** - To develop their understanding and knowledge of how to stop attack effectively. To perform the different types of defensive techniques in different situation.

**Set Plays** - To perform crosses using varying height, speed and positioning. To develop creativity in developing new strategies from corner kicks in attack and defence.

## PRIOR LEARNING

**It is helpful if the pupils have:**

Experienced setting up and organising football practices in groups.

Applied and adapted the principles of attack and defence in small, sided games

Lead own warm up and cool down safely.

Learnt about specific techniques  
Used and applied football rules correctly.

## Key Vocabulary

Offside  
High-line  
Man-to-man  
Offside trap  
Through pass  
Touch line  
Pressure  
Attack  
Defence  
Push-up  
Goal side  
Play-on  
Advantage

# Year 9 Religious Studies – Topic: Can we put a price on Human Life?

## Muslim beliefs on the Death

### Penalty

Muslims follow Shari'ah law. Everyone is subject to the law, It is best to forgive a wrong and be charitable if it does not lose your honour. First reason with wrongdoer. Justice will always be carried out in public so that justice is seen to be done.

Islam accepts capital punishment, but the victim's family have the right to pardon the offender. Forgiveness is a strong theme in the Qur'an. Sometimes monetary compensation is authorised instead of death.

## Christian Beliefs on the Death

### Penalty

Teachings of Jesus based on forgiveness and compassion Many Christians feel that this is the ideal, not the reality. They focus on reforming the criminal Many Christian reformers have focussed on ensuring prisoners are treated fairly. These vary widely, from the pacifist view of the Quakers to the acceptance of capital punishment as allowed by law.

Roman Catholic Church considers it 'lawful slaying'  
Anglican Church is opposed to it.

## Arguments FOR and Against the Death Penalty

It permanently removes the worst criminals, protecting society and making it a safer place. Only God is in control of life and death. The Bible says that all human lives are valuable.

There are alternatives to the death penalty that offer the opportunity for reformation. The death penalty lowers the value of life in society. Innocent people could be executed by mistake. What if it was manslaughter rather than murder. If someone murders someone, it is just to do the same to them – they have given up their human rights.

Genesis 9:6: 'Whoever sheds a man's blood, by man shall his blood be shed.' – After the flood, God said that capital punishment should be used for murderers. Fear of the death penalty is the best deterrent. In Singapore, where capital punishment is legal there is far less serious crime. It is cheaper than imprisoning someone for the rest of their lives. It gives the families of murder victim's true retribution.

Capital punishment is awful for the families of murderers to have to endure. It is uncivilized and barbaric.



## Exam questions

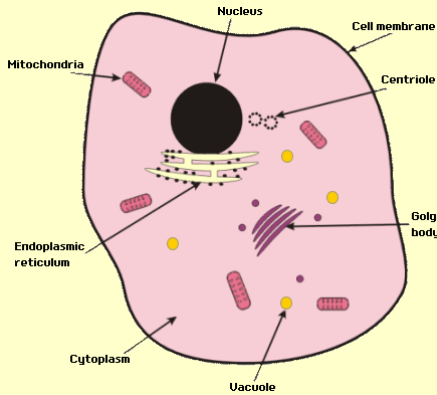
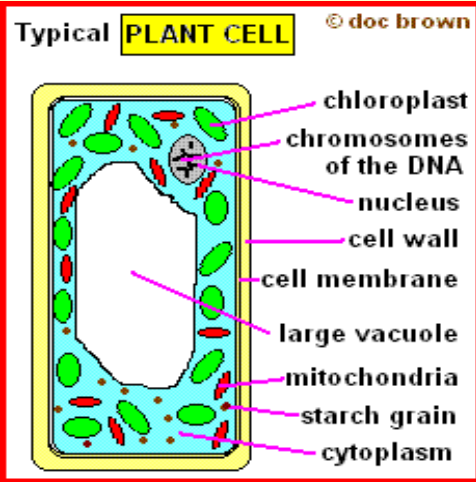
1. What is a crime? (2 marks)
2. Explain using examples of how Christians believe we should treat all criminals. (4 marks)
3. List 3 crimes that deserve the death penalty (3 marks)
4. What does the word forgiveness mean? (2 marks)
5. Should criminals be forgiven? Explain your views. (4 marks)

## Key Vocabulary

Death penalty  
Laws  
Crime  
Criminal  
Justice  
Forgiveness  
Conscience  
Truth  
Reform  
Rehabilitation  
Quality of Life  
Manslaughter  
Murder  
Compensation  
Pardon

- Quality of life refers to the overall wellbeing and happiness of an individual and can encompass physical health, mental health, and lifestyle factors.
- It is generally recognised that a good quality of life includes feeling safe and secure, having access to basic human needs, being able to engage in enjoyable activities, and experiencing happiness, satisfaction, and fulfilment. The quality-of-life concept plays a role in discussions about ends of life. Debates around euthanasia, for example, often revolve around arguments about whether a person's quality of life might be so seriously diminished that they should have the right to choose to end their own life.
- The balance between sanctity of life and quality of life can become a complex ethical issue. Some may argue that preserving life at all costs is paramount (sanctity of life), while others may argue that it might be more compassionate to prioritise a person's wellbeing and happiness (quality of life).

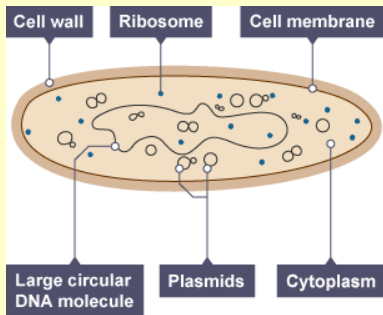
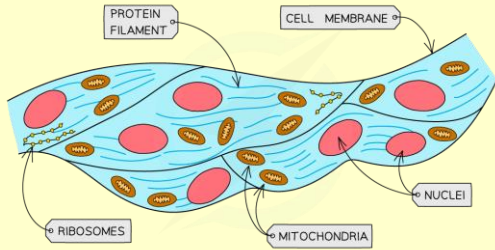
# Year 9 Science – Topic: Cells revision



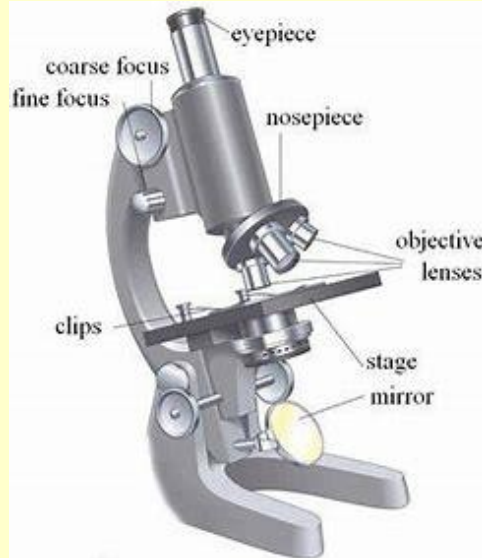
TYPICAL PLANT CELL

## Top Key takeaways:

- Microscopes allow us to observe cells and structures too small to see with the naked eye.
- Animal cells are specialised to perform specific functions, such as carrying oxygen or sending signals.
- Plant cells are adapted to perform roles such as photosynthesis or water transport.
- Prokaryotic cells, such as bacteria, lack a nucleus and are simpler than eukaryotic cells.



A BACTERIA



## Topic key vocabulary:

Prokaryotic Cell  
 Chloroplast  
 Nucleus, cytoplasm, organelles  
 Specialised Cell  
 Microscope  
 Eukaryotic  
 Muscle cell  
 Nerve cell  
 sperm cell

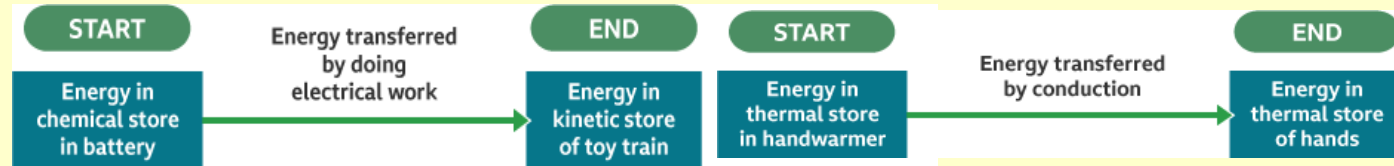


Key Questions : How is a root hair cell adapted to its function?

Give an example of a specialised animal cell and describe its function.

What is the function of the objective lens in a microscope?

# Year 9 Science – Topic: Energy revision



Transferring energy  
 In each of these examples, energy is transferred by one of the following four types of energy transfer:

- mechanical work** - a force moving an object through a distance
- electrical work** - charges moving due to a potential difference
- heating** - due to temperature difference caused electrically or by chemical reaction
- radiation** - energy transferred as a wave, e.g. light and infrared - light radiation and infrared radiation are emitted from the sun

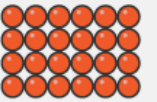


**Key points**  
**Energy stores**

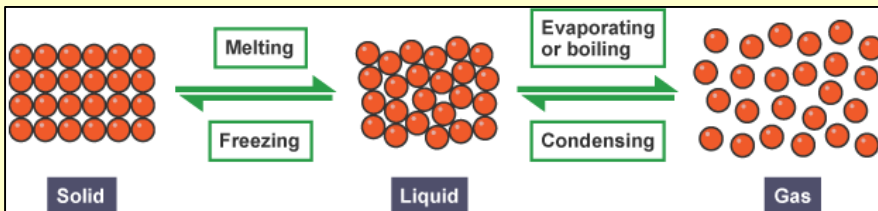
- can be described as being in different 'stores'.
- Energy cannot be created or destroyed.
- Energy can be transferred from one store to another.

- ENERGY STORES**
- magnetic
  - internal (thermal)
  - chemical
  - kinetic
  - electrostatic
  - elastic potential
  - gravitational potential
  - nuclear

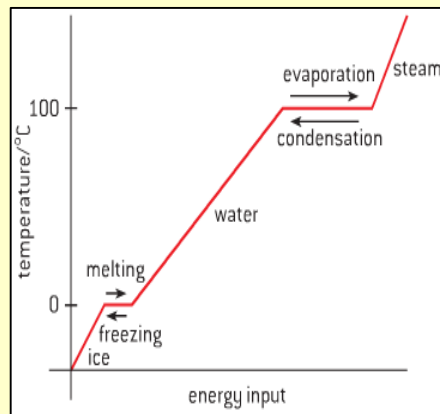
Energy store	Description	Examples
Magnetic	The energy stored when repelling poles have been pushed closer together or when attracting poles have been pulled further apart.	Fridge magnets, compasses, maglev trains which use magnetic levitation.
Internal (thermal)	The total kinetic and potential energy of the particles in an object, in most cases this is the vibrations - also known as the kinetic energy - of particles. In hotter objects, the particles have more internal energy and vibrate faster.	Human bodies, hot coffees, stoves or hobs. Ice particles vibrate slower but still have energy.
Chemical	The energy stored in chemical bonds, such as those between molecules.	Foods, muscles, electrical cells.
Kinetic	The energy of a moving object.	Runners, buses, comets.
Electrostatic	The energy stored when repelling charges have been moved closer together or when attracting charges have been pulled further apart.	Thunderclouds, Van De Graaff generators.
Elastic potential	The energy stored when an object is stretched or squashed.	Drawn catapults, compressed springs, inflated balloons.
Gravitational potential	The energy of an object at height.	Aeroplanes, kites, mugs on a table.
Nuclear	The energy stored in the nucleus of an atom.	Uranium nuclear power, nuclear reactors.

# Year 9 Science – Topic: Particle theory, states of matter, changes of state, diffusion, density - revision

State	Solid	Liquid	Gas
Diagram			
Arrangement of particles	Regular arrangement	Randomly arranged	Randomly arranged
Movement of particles	Vibrate about a fixed position	Move around each other	Move quickly in all directions
Closeness of particles	Very close	Close	Far apart



As a substance is heated it gains energy. When the particles gain enough energy they overcome the forces between them. Whilst a change of state is happening the temperature of the substance does not change. (flat line on graph)



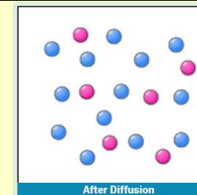
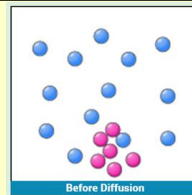
## Diffusion

Particles in a liquid or a gas **spread** out from an area of **high concentration** to an area of **low concentration** until the concentrations are equal.

The **higher** the concentration **gradient** the **faster** the net diffusion.

The **higher** the **temperature** the **faster** the net diffusion.

If the particles that are spreading are **water** molecules we call this process **osmosis**.



## Density

1 kg of a gas has a larger volume than 1 kg of a solid.

There is empty space between particles in a gas, but in a solid, they are tightly packed together.

$$\text{Density} = \text{Mass} / \text{Volume}$$

... so the density of the gas is much smaller than the density of the solid.

## Risk Assessment

Hazard	Risk	Level of risk	Control measure
What could cause harm? e.g. electricity	What harm could it cause? e.g. electrical shock, burns to the skin	How likely is it to happen and how bad would it be? Low, medium or high risk?	What safety precautions will be taken? e.g. wear safety goggles, ensure all wires and equipment is tested, fused, earthed and insulated. Do not use near water.

How Science works:

The independent variable – The one factor that can be changed in an investigation

The dependent variable – The one thing that needs to be measured in an investigation

Control variable – all the factors that need to be kept the same to ensure the investigation is fair

# Year 9 Wellbeing

## Mindfulness and Meditation can help most people at times!

Our 'everyday mind' can end up full of worries about things which are no longer true or happening or fretting about what MIGHT happen in the future – even though we know it may not! The idea is that we are more than these conscious thoughts.

Challenging things happen, we cannot avoid that, but what we think about those challenges is very much up to us

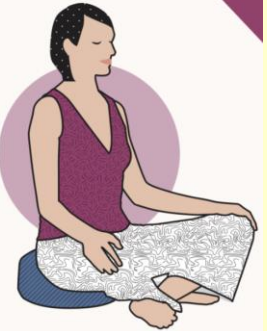
To worry and repeatedly think about difficult things can become suffering - a habit it is all too easy to fall in. The good news however is that we can avoid it! How?

When we notice that we are worrying about things - playing through possible futures like a film in our heads or imagining something going wrong, or even remembering difficult things, unpleasant experiences, **we can simply choose to bring ourselves back to the present moment, by thinking about our breathing.**

This practice comes with lots of benefits...

## How to Practice Mindfulness

- 1 Take a seat.** Find a place to sit that feels calm and quiet to you.
- 2 Set a time limit.** If you're just beginning, it can help to choose a short time, such as 5 or 10 minutes.
- 3 Notice your body.** You can sit or kneel however is comfortable for you. Just make sure you are stable and in a position, you can stay in for a while.
- 4 Feel your breath.** Follow the sensation of your breath as it goes out and as it goes in.
- 5 Notice when your mind has wandered.** When you get around to noticing this—in a few seconds, a minute, five minutes—simply return your attention to the breath.
- 6 Be kind to your wandering mind.** Don't judge yourself or obsess over the content of the thoughts you find yourself lost in. Just come back.



## The Benefits of Meditation for Students



I know it seems way too simple! But this is an ancient practice with traditions in all major religions – including Islam and Christianity! I know that it will seem odd at first. That is your worrying mind trying to stop you taking control over it! But stick with it – it will help! Regularly practicing will really help!

If you are struggling with worries regularly you might want to get some support – you can start with Kooth – go to their website and sign up – it is easy, and they will help! If you need help on a specific aspect of Mental Health you can always start at the excellent FYI website here: <https://www.fyiorfolk.nhs.uk/> - it costs nothing to sign up and get help!