

Working together to turn
your child's potential
into reality.



2022



JWS Year 7 Knowledge Organisers

Autumn Term 2022



JWS

Parent Day Potential into Reality

What is a Knowledge Organiser?

At John Willmott School, our experienced teachers have collated all key learning information into a pupil-friendly learning resource.

The knowledge organiser supports your child's learning journey across all subject areas, teaching pupils how to access, organise, revise and retrieve key content. The knowledge organiser is a key tool in your child's learning journey here at John Willmott and supports all pupils in reaching their potential in their upcoming assessments.

How do the Knowledge Organisers help to prepare my child for their upcoming assessments?

The Knowledge Organisers in this pack are structured by subject. Each subject area supplies your child with condensed, categorised content helping your child chunk content to learn, revise and recall. Regular use and familiarisation with the Knowledge Organiser will provide your child with a solid foundation of knowledge, putting them in good stead to achieve highly on their assessments. The **"Know It, Think It, Grasp it"** section challenges your child further with questions and activities to assess and reflect on their learning.

FAQ's: Frequently asked Questions.

Can I have a digital copy of the Knowledge Organiser?

Digital Copies of all Knowledge Organisers can be found on our school's website: jws.bham.sch.uk

In addition, you can scan the QR code on the front of the booklet for a virtual e-book.

JWS

Year 7

Knowledge Organisers

Contents

2022



Year 7 Subjects

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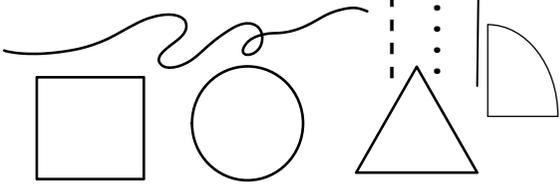
Art & Design: The John Willmott Bake Off

The Formal Elements

The **formal elements** are the key ingredients when creating any piece of artwork. They are known as **line, tone, texture, shape, form, pattern, space** and **colour**.

Line: a mark or stroke, such as dashed, dotted, straight, curved etc.

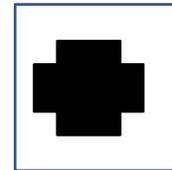
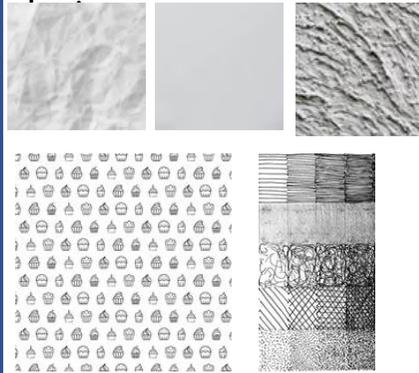
Shape: the outline of something.



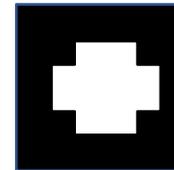
Texture: the look or feel of a surface such as rough, smooth, bumpy etc.

Space: the area an object takes up.

Pattern: a repeated or decorative



Positive
The inside
of a shape.



Negative
The area
surrounding
a shape.

WOW Words

Formal Elements
Line, Tone, Texture
Shape, Space, Colour
Form, Pattern
Pressure
Proportion
Primary Observation
Secondary Observation

**Draw light until
you get it right!**

The Formal Elements

Tone: the lightness or darkness of a colour. This can be used to show shadows and highlights.

Form: a three dimensional object.

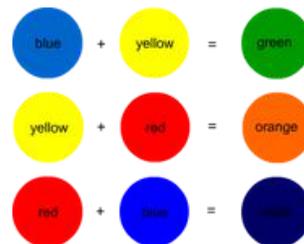


Colour

Colour: the quality of something created by the reflection of light.

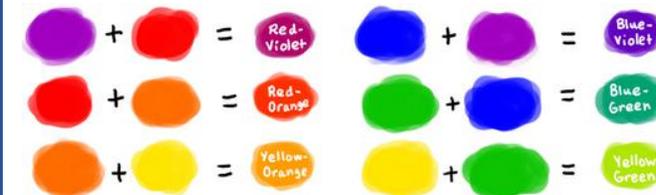
Primary: a colour that cannot be made (Red, yellow and blue).

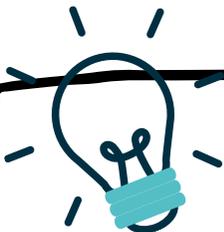
Secondary: a colour made by mixing two primary colours together.



Tertiary: a colour made by mixing a primary and secondary colour together.

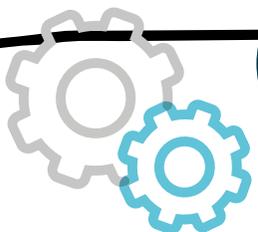
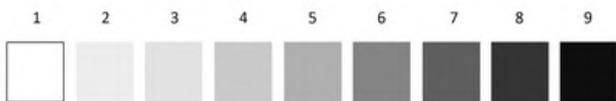
Yellow + green = yellow green





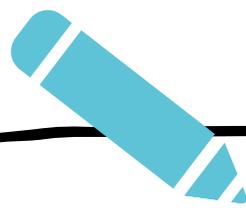
KNOW IT

1. **Line** is a mark made on a surface that joins different points. Lines can vary in length, width, direction and shape.
2. **Shape** is a two-dimensional area. Shapes have height and width but not depth.
3. **Texture** means how something feels. There are two types of texture: actual texture and visual texture.
4. **Tone** is the lightness or darkness of a colour. This can be used to show shadows or highlights.
5. **Forms** have three dimensions, height, width and depth.
6. **Space** can refer to objects and to the area around them.
7. **Pattern** is a design in which lines, shapes, forms or colours are repeated.



THINK IT

- How many types of **line** could you draw? For example:- Straight, curvy, zig-zag, wavy? Think of six more.
- How many **shapes** could you trace with your finger in the air? Example:- Circle, diamond. Try doing six more.
- Imagine the **texture** of a sieve which you could find in the kitchen. Feel the texture of ten different objects around the house and describe them to someone.
- Research and look at the paintings of **Wayne Thiebaud**. Describe the colours he uses in his paintings. Name six of those colours.
- What is **Tom Hovey** famous for? Search his artwork and describe to someone how he uses space and pattern in his work. Example:- Background, repeat pattern.



GRASP IT

1. **Line:** Draw a chocolate bar wrapper using line only. Be sure to include the detail of the wrinkles in the wrapper and the lettering.
2. **Shape:** Fill a page with outline shapes. Explore with scale, overlapping and composition.
3. **Texture:** Find objects and surfaces with unusual texture. Place a sheet of paper over the top and create a series of rubbings using a range of material such as pencil, charcoal, pastel etc.
4. **Tone & form:** Draw a kitchen utensil that is used to bake a cake e.g. a spoon, a whisk. Start with the outline and add tonal shading.
5. **Space:** You will need 3 complimentary colours pieces of paper (2 x orange and 1 x blue). On the first sheet (blue), using one half, draw the outline a cupcake. Cut it out and stick it on the second sheet (orange). The remaining cut (blue) should be stuck on the other orange sheet. You now have a positive and negative space image.
6. **Pattern:** On a 10x10cm piece of tracing paper, create an outline drawing of a slice of cake. Cut a piece of paper to 20cmx20cm. Now trace your cake drawing four times next to one another, reversing as you go. Now you have made your very own repetitive pattern. Add primary colours to the first and third sections and secondary colours to the second and fourth section.



Drama: Introduction to Drama



1. What do we do in Drama?

- When we talk about Drama, we focus on three main elements in our lessons.
- There is the Rehearsal process, where we create, devise and improve practical work.
- There is the Performance, where we perform our work to others, carefully considering impact on audiences.
- There is then reflection and analysis, where we discuss and evaluate our work and the work of others.

2. What do we need to know in our first term?

- We need to know that **POSTURE** is the way you hold and use your body and that it can most easily show **WHO** we are.
- We need to know that **GESTURE** is a movement that does not take us anywhere. It can be with any of your limbs, and most easily shows **WHAT** we are doing.
- We need to know that **FACIAL EXPRESSION** is how we move our heads and face. It can most easily show our **EMOTIONS**.
- We need to know that **MOVEMENT** and **VOICE** are pretty obvious... But that they can show **EMOTION, SITUATION** or **CHARACTER**.

3. WOW WORDS

POSTURE
GESTURE
FACIAL EXPRESSION
MOVEMENT
VOICE
STILL IMAGE
SCULPTING
THOUGHT TRACKING
MIMING
REHEARSAL
PERFORMANCE
AUDIENCE
STAGE
POSITIONING

4. Key rules

- Beyond the normal rules for the classroom, there are some simple rules worth considering for Drama.
- 1) Performing is hard, being in the audience is easy, do your best to support performers
- 2) Failure is a really important step for any performer, embrace it!

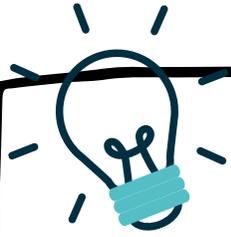
5. How we use REHEARSAL strategies

- Rehearsal strategies are like a coaching session in a sport. They are used to focus our attention on the elements of a performance that need improving, without the unnecessary distractions of other parts of a performance.
- Example: If someone is struggling with finding the right voice for their character, we might use the rehearsal strategy **MIME** to check their **POSTURE, FACIAL EXPRESSION, MOVEMENT & GESTURES** are correct first.

6. Rehearsal Strategy list

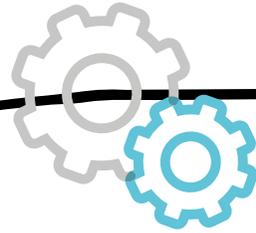
These are what we can use in Y7 and what they can help actors assess and improve!

Still Image – Posture, Gesture, FE, Positioning
Sculpting – Posture, Gesture, FE
Mirroring – Posture, Gesture, FE, Positioning
Thought Track – Character Understanding
Hot Seating – Character Understanding
Clowning – Larger, exaggerated character
Mime – Posture, Gesture, FE
Talking Heads – FE, Voice
Jibberish – Voice, Gesture, Facial Expression (*FE – Facial Expression!)



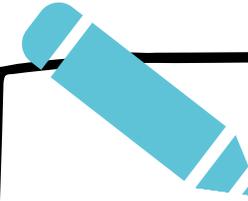
KNOW IT

1. Do I know what the characterisation elements Posture, Gesture, Facial Expression, Movement and Voice are?
2. Do I know what they change about a character?



THINK IT

- We need to know that POSTURE is the way you hold and use your body and that it can most easily show WHO we are.
- We need to know that GESTURE is a movement that does not take us anywhere. It can be with any of your limbs, and most easily shows WHAT we are doing.
- We need to know that FACIAL EXPRESSION is how we move our heads and face. It can most easily show our EMOTIONS.
- We need to know that MOVEMENT and VOICE are pretty obvious... But that they can show EMOTION, SITUATION or CHARACTER.



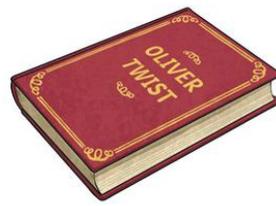
GRASP IT

Challenge

- Stand in front of a mirror and;
- Change your posture to show >3 different types of character
 - Use >5 gestures to show different actions
 - Use >5 different facial expressions, trying to show different emotions
 - Have a look at the world around you and;
 - See if you can observe and compare the way that different people walk
 - Listen to the television and radio for different accents and uses of voice
 - Try on your own to change your own movement and voice to match voices and movements you've seen!



English: Oliver Twist



3. Plot Summary

Oliver is born in the workhouse. When he is a bit older he is nominated to ask for more food because the boys are starving. He is kicked out of the workhouse and given away to the Sowerberry family to be an undertaker's apprentice. He's bullied by Noah, they fight and he is locked up. Oliver runs away to London, meets Dodger and is introduced to Fagin's gang. Oliver is taken out with the gang and is horrified to see Dodger steal a gentleman's handkerchief. Oliver is wrongly arrested for the theft. The gentleman, Mr. Brownlow, takes pity on Oliver and takes him in. The gang plot to get him back in case he reveals information about them. Oliver is abducted by the gang whilst running an errand for Mr. Brownlow. Oliver is used by Sikes in a burglary. They fail and Sikes runs away. Oliver is left behind but the people who live there feel sorry for him and look after him. They are called Fred and Rose Maylie. When Bill and Fagin realise what has happened, they plot to catch Oliver again. Nancy overhears and visits Mr. Brownlow to warn him. Fagin tells Bill about Nancy's betrayal and Bill murders her. Fagin is discovered and sent to prison and Bill dies trying to run away. Oliver discovers who his parents were and joins Mr. Brownlow and the Maylies to live happily ever after.

1. Character List

Oliver Twist – an orphan
Mr Bumble – runs the workhouse where Oliver is
Mrs Bumble – Mr Bumble's wife
Mr Sowerberry – an undertaker: takes Oliver as an apprentice
Mrs Sowerberry – Mr Sowerberry's wife
Noah Claypole – Sowerberry's apprentice, who bullies Oliver
Mr Brownlow – a kindly gentleman: takes Oliver in
Fagin – a fence
Bill Sikes – a professional burglar
Nancy – Bill Sikes's girlfriend
The Artful Dodger – Fagin's most effective pickpocket
Rose Maylie – Oliver's second benefactor, later found to be his aunt

2. Key Words

orphan a child whose parents are dead.
moral (n.) a lesson that can be taken from a story or experience.
vulnerable exposed to the possibility of being harmed, either physically or emotionally.
brutal savagely violent.
corrupt acting dishonestly in return for money or personal gain.
villain a character whose evil actions or motives are important to the plot.
malicious intending to do harm.
victim a person harmed or killed as a result of a crime, accident, or other event or action.
naïve showing a lack of experience, wisdom, or judgement.
context real life factors that explain why a text was written

5. Themes

Poverty
Crime
The Law
Good and Evil



4. Social and Historical Context

Victorian London

- Lots of people lived in poverty, unable to buy food or rent a house.
- Jobs were hard to find and often paid too little to live on.
- There was a lot of disease and the poor could not afford treatment (no free healthcare).
- Nearly half of all children died before the age of five. Childbirth was very dangerous for women. Lots died whilst giving birth.

The Poor Law: 1834

- The government wanted to stop people begging on the streets.
- It made it illegal for the poor to be given food or money and created workhouses instead.

The Workhouses

- Workhouses were so horrible that no one wanted to go there unless they were desperate.
- People worked for their food and shelter, not for money.
- The work was very hard and often dangerous.
- They were given hardly any food. They were given gruel, a thin liquid of oats and water.
- Punishments for disobeying the rules were extremely harsh.

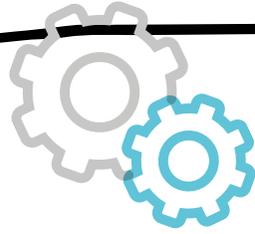
Charles Dickens

- Dickens had a strong social conscience. His writing criticised economic, social, and moral issues in the Victorian era.
- He showed compassion and empathy towards the vulnerable and disadvantaged people in English society.
- Dickens himself had a traumatic childhood; his father was imprisoned for debt and he was forced to work in a shoe-blackening factory at 12 years old.
- In 'Oliver Twist', Dickens draws attention to the deprivation of the lower classes, the appalling way that paupers were treated, and the conditions they were forced to endure.



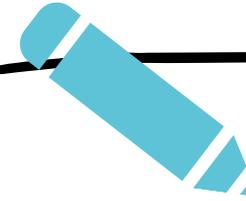
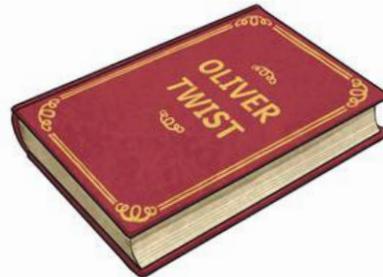
KNOW IT

1. Give a definition of each key word.
2. List all the characters in the text.
3. List all the figurative language techniques that you can recall.
4. What does PETAL stand for?
5. How are the characters related to each other?
6. Can you summarise the plot in 50 words?
7. Can you list the 10 most important plot points?
8. Can you put the main plot points into chronological order?
9. Which 5 words best describe the protagonist?
10. Which 5 words would you use to describe other key characters?
11. What are the main themes in the text?
12. What are the social and historical links to the text?
13. How did Charles Dickens feel about Victorian society? Why?



THINK IT

1. How do you use the PETAL paragraph structure to write a character analysis?
2. Why is the context of a play/novel important?
3. How do the main themes link to the protagonist?
4. How do the main themes link to other characters in the text?
5. Is the author challenging, endorsing, or simply reflecting the dominant ideas and assumptions of the time and place in which they are writing?

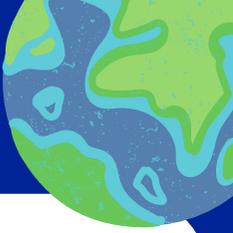
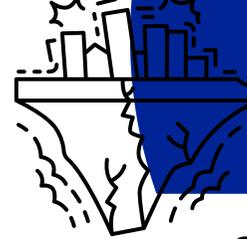


GRASP IT

1. What is the impact of the opening of the text?
2. What is the impact of figurative language use within the text?
3. Why are the key themes important for the reader/audience to understand?
4. Why might a modern day audience or contemporary reader criticise the author's intended message?



Geography: Hazardous World



1- Japan



Where is Japan?

Japan is in Asia and is made up of 4 main islands; Honshu, Hokkaido, Kyushu and Shikoku. The capital city is Tokyo. Japan is home to many major global companies including Honda, Nissan and Toshiba.

Why is Tokyo important to Japan?



Local – there are 15 hospitals in Tokyo.



National – Tokyo is at the centre of Japan's transport system with the busiest metro system in the world.



International – over 2000 international companies



have their headquarters located in Tokyo.

2- Earthquakes

An earthquake happens when tectonic plates move. It is the sudden release of energy that creates seismic waves that are felt as vibrations.

There are 3 ways that earthquakes can be measured:

- **The Richter scale** measures the magnitude of a tremor using a seismograph.
- **Moment magnitude scale** is a measure of an earthquake's magnitude based on its seismic moment.
- **The Mercalli scale** measures how much damage is caused by earthquakes based on observations.



Tsunamis

A tsunami is a very large ocean wave that is caused by an underwater earthquake. The Tohoku earthquake in Japan happened on 11th March 2011 causing a devastating tsunami which reached heights of 135 ft. There were many impacts and responses to this natural disaster which can be categorized into social, economic and environmental.

4- Plate boundaries



Constructive – plates move away from each other causing earthquakes and volcanoes.



Destructive – oceanic plate descends underneath continental plate causing earthquakes and volcanoes.



Conservative – plates move past each other causing earthquakes.

Collision – two continental plates move towards each other causing earthquakes.



5- WOW Words

Social = effects on people

Economic = effects on money/jobs

Environmental = effects on land/atmosphere/animals

Nuclear power plant = a thermal power station in which the heat source is a nuclear reactor.

Aid = providing help to another country

3- Why is Fukushima deserted?

The 2011 tsunami toppled sea defences at Tohoku protecting Fukushima nuclear power station and the flooding caused a power



6- How can we respond to natural disasters?



Emergency relief – gives immediate help by providing rescue, safety and emergency food/water/medical supplies.

Short-term relief – helps give support in the first few weeks and months. Provides shelter, food, clothes, water and medical care.

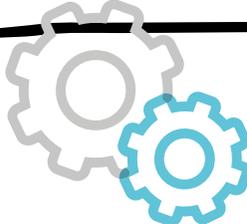


Long-term aid – helps get people back to normal. It involves repairing roads, providing jobs and preparing disaster plans for the future.



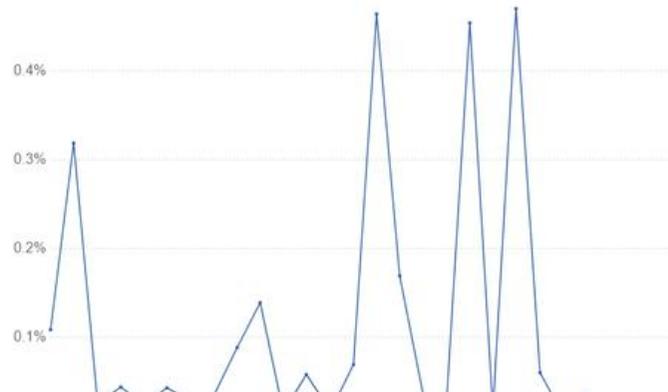
KNOW IT

1. What continent is Japan on?
2. Give one reason why Tokyo is important internationally.
3. How many plate boundaries are there?
4. Which plate boundaries will you find volcanoes?
5. Which plate boundaries will you find earthquakes?
6. Name the 3 ways that you can measure an earthquake.
7. When did the tsunami in Tohoku happen?
8. Why is Fukushima deserted?
9. What is the difference between short-term and long-term relief?
10. Give an example of emergency relief.

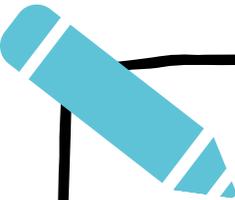


THINK IT

Deaths from natural disasters as a share of total deaths



1. Are natural disasters getting worse? Or are we just getting better at recording them? Use the graph above and your own research to support your answer.
2. Does a country's wealth have an impact on how it can deal with natural disasters? Explain your answer and use real life examples to support.
3. Do you think Fukushima will ever be able to re-open? Think like a geographer and support your answer with evidence.



GRASP IT

1. Which responses to the 2011 tsunami do you think were the most effective? Explain your reasons why.
2. Research the boxing day tsunami that hit Thailand in 2002. What were the differences in that natural disaster to Tohoku in 2011?
3. Write a newspaper article reporting on the Fukushima nuclear disaster. Include the causes, impacts and responses.



History: The Norman Conquest



1. The Contenders

William of Normandy- He was also promised the throne by Edward. Already the ruler of Normandy.

Harold Godwinson: He was English and the Witten's favourite candidate (the King's council of men). He was promised the throne by Edward. Harold Godwinson swore an oath in front of Edward to say he would be King. Had the support of the English people.

Harald Hardrada- A Viking. Believed he had a claim to the throne and he wanted to take the crown for himself

4. WOW WORDS

Crisis: A time of intense difficulty or danger

Successor: A person who follows next in order or a thing or person that immediately replaces something or someone

Contender: A person competing with others to achieve something.

2. Why did William win the Battle of Hastings?

Luck - The weather changes to William could sail across the English channel. At a key moment in the battle Harold was killed.

William's bravery and leadership - William skilfully arranged his army in rows. He ordered his men to retreat which cleverly made the English come down from the hill. Then the Normans surrounded and killed them.

Harold's mistakes - Harold didn't let his men rest when marching back from the North. During the battle, Harold fought in a shield wall with his troops which made it difficult to give orders.

William's preparations - William had assembled a great army and a great store of weapons. William built many ships to carry his forces across the sea.

5. Key Themes



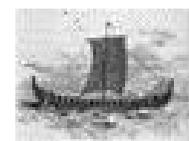
Luck



Bravery

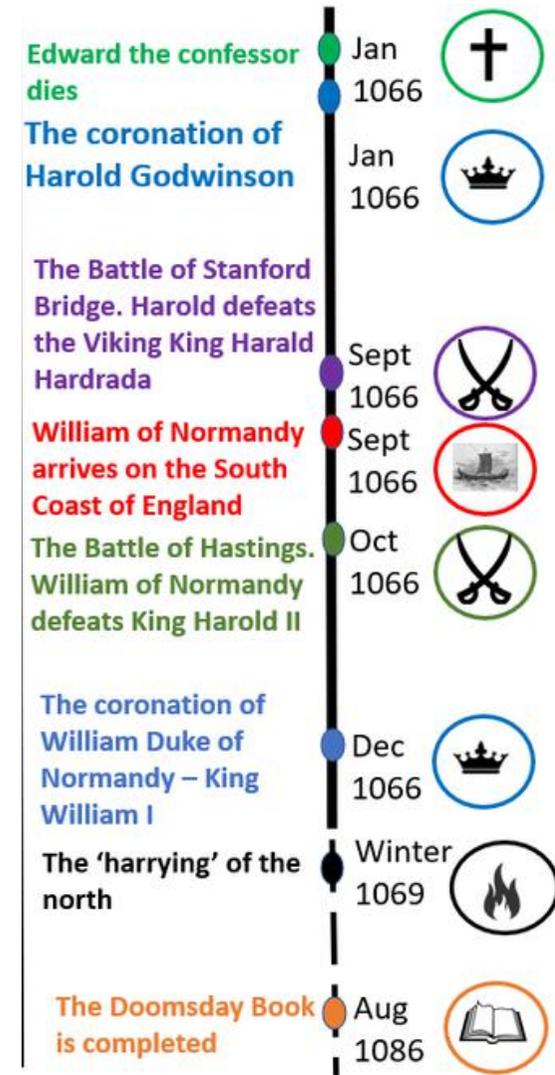


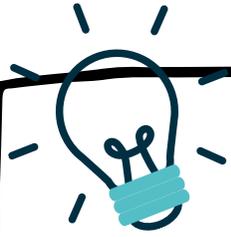
Mistakes



Preparations

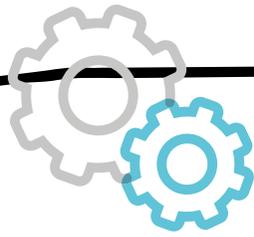
3. Key Events





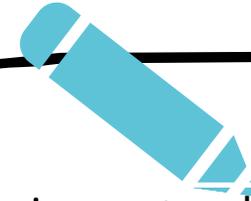
KNOW IT

1. Who died in 1066?
2. What did he leave the country without?
3. Name the 3 men who wanted to take the English throne.
4. Why were Godwinson's army so unprepared for the Battle of Hastings?
5. Why were William's army more prepared?
6. Give four reasons why William won the Battle of Hastings.
7. When was the Domesday Book completed?



THINK IT

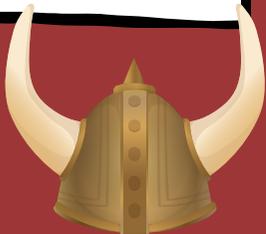
Why was 1066 a 'crisis'?
Did Harold Godwinson make the right decisions?
Do you think William the Conqueror would be accepted by the people of England as the new King?



GRASP IT

Design a storyboard showing the order of events from:

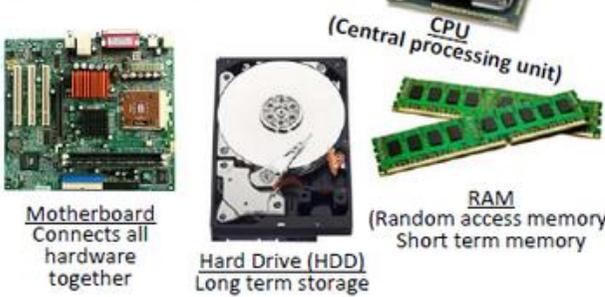
- Edward the Confessor's death
- Who should be King
- The Battle of Stamford Bridge
- The Battle of Hastings
- What William did after he won
- How William established control



Information Technology: Computer Systems and Data Representation

A: Computer Systems

Every computer system takes an input, processes it to give an output.



B: Hardware and Software



C: Storage Units

Units	Capacity
Bit	1 or 0 (Smallest unit of data)
Byte	8 bits
Kilobyte	1000 bytes
Megabytes	1000 Kilobytes
Gigabytes	1000 Megabytes
Terabytes	1000 Gigabytes

D: Binary Conversion

Binary to Decimal

128	64	32	16	8	4	2	1
0	0	0	1	0	1	0	1

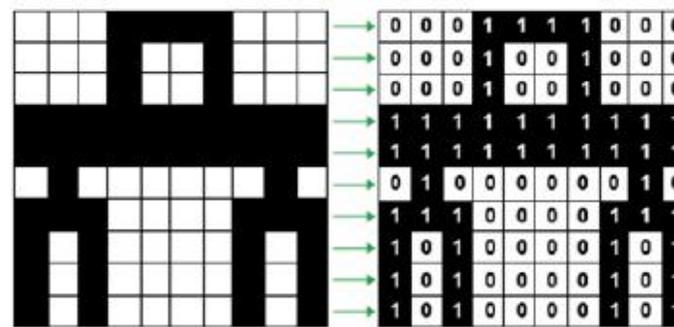
Adding these together gives 21

Decimal to Binary

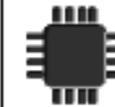
64	32	16	8	4	2	1
0	1	0	1	0	0	1

18 2 0

E: Bitmap Images



F: Keywords



Hardware: The physical components that make up a computer.



Software: The programs installed on a computer.



Input: Putting data into a computer system. E.g. Text, click a button



Process: The action that is taken with the input data. E.g. a calculation, loading.



Output: Data that is given by the computer system. E.g. sound, image



Storage: An area that saves data and documents.



Peripheral: A device connected to a computer to allow inputs or outputs.



Decimal: Base 10 number system used by humans.



Binary: Base 2 number system used by computers.



Bitmap: An image made up of dots (pixels) represented by binary.

Pixel: Smallest part of a bitmap image.

Resolution: How many pixels are there in a bitmap image.

Bit depth: How many bits are used in each pixel.

Title

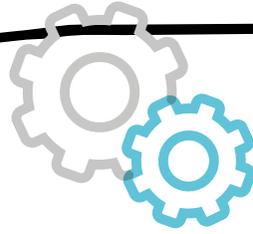


KNOW
IT

Computer Systems and networks

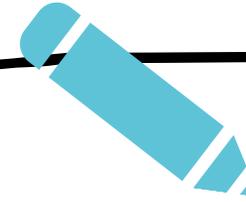
Know

- What a computer system is
- How technology has developed over time
- The purpose of the CPU
- What hardware and software is
- Key figures in computing history



THINK
IT

- Label the parts of a computer diagram
- Can complete grid with new jobs due to advancement of technology
- Can correctly identify by labelling computer components as hardware and software
- Can create a fact file on key historical computing figures



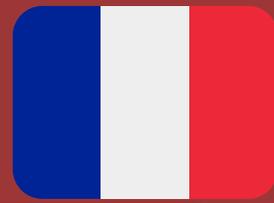
GRASP
IT

- Explain the functions of different parts of a computer
- Analyse the difference technology has made to the world we live in
- Evaluate how different pieces of hardware are used as input devices and output devices



Computer Systems
and Data
Representation

Modern Foreign Languages: Avant Le Départ



1. JE M'APPELLE

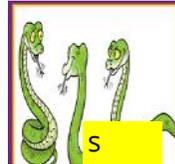
Je m'appelle



Je m'appelle Théo et j'ai treize ans.
Je viens de la France et j'habite à
Toulouse.

My name is Théo and I am 13
years old. I come from France and
I live in Toulouse.

2. KEY PHONICS



3. STAR WORDS

Comparative:

Il est **plus** sportif **que** mon frère
He is **more** sporty **than** my brother

Ne ... plus

Il **n'est plus** paresseux

Giving opinions

Je pense que - I think that

Je dirais que - I would say that

Mes parents pensent que - My
parents think that

Mes parents pensent que je suis
bavard

My parents think that I'm chatty

4. LES ADJECTIFS

j'ai les yeux bleus

les cheveux bruns

Je suis de taille moyenne. J'ai **les**
cheveux bruns et les yeux verts.

I am average height. I have
brown hair and green eyes.

5. LE NÉGATIF

ne verb pas

je **ne suis pas** petit

il **n'est pas** actif

ce **n'est pas** mon
truc

Il est bavard et drôle, mais il **n'est pas** actif. Il
déteste la natation.

He is chatty and funny, but he is **not** sporty. He
hates swimming.



6. C'EST = IT IS

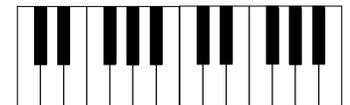
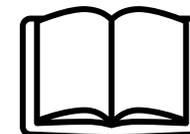
J'adore tchatter, parce que c'est
divertissant.

J'aime lire parce que **c'est** relaxant.

Cependant je déteste jouer du piano

I love reading because it's relaxing.

However, I hate playing piano.



Modern Foreign Languages: Avant Le Départ



KNOW IT

1. Translate:

Je m'appelle Théo et j'ai treize ans. Je viens de la France et j'habite à Toulouse.

2. Translate:

Je suis de taille moyenne. J'ai les cheveux bruns et j'ai les yeux marron.

3. Translate:

Mes parents pensent que je suis très travailleur, mais je ne suis pas d'accord!

4. Translate:

Mon meilleur ami s'appelle Bruno. Il a les cheveux roux et les yeux verts. Il a quatorze ans.

5. Translate:

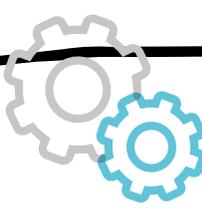
Il est bavard et drôle, mais il n'est pas actif. Il déteste la natation.

6. Translate:

J'aime lire parce que c'est relaxant. Cependant je déteste jouer du piano.

7. Translate:

Ce n'est pas mon truc. Je pense que faire du sport est plus divertissant que regarder la télévision.



THINK IT

1. Adapt sentence 1 to write:

My name is Maria et I am 11 years old. I come from England and I live in Birmingham.

2. Adapt sentence 2 to write:

I am short. I have blond hair and blue eyes.

3. Adapt sentence 3 to write:

My dad thinks that I am lazy and I agree!

4. Adapt sentence 4 to write:

My best friend is called Laura. She has long hair and brown eyes. She is twelve years old.

5. Adapt sentence 5 to write:

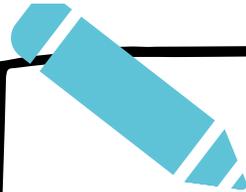
She is shy and sporty, but she is not chatty.

6. Adapt sentence 6 to write:

I love to listen to music because it is fun, but I hate horse riding.

7. Adapt sentence 7 to write:

I think that playing video games is more exciting than playing football – it's my thing.



GRASP IT

1. Use the structures in sentence 1 to write a sentence about yourself.

2. Use the structures in sentence 2 to write a physical description of yourself.

3. Use the structures in sentence 3 to write about your personality.

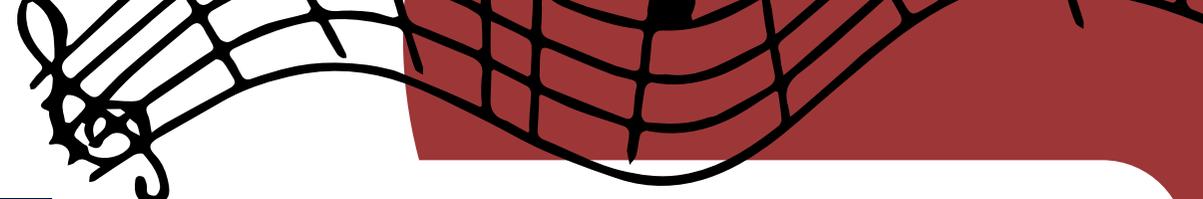
4. Use the structures in sentence 4 to describe the physical appearance of a friend.

5. Use the structures in sentence 5 to add detail about your best friend.

6. Use the structures in sentence 6 to write about what you like to do in your free time.

7. Use the structures in sentence 7 to add details about what you do in your free time.

Music: I've Got Rhythm



1. KEYWORDS

PULSE – A regular **BEAT** that is felt throughout much music. Certain beats of the pulse can be emphasised to establish regular pulse patterns e.g.

1 2 3 4, 1 2 3 4 = a 4-beat pulse

1 2 3, 1 2 3 = a 3-beat pulse (often called a **WALTZ**)

1 2, 1 2, 1 2 = a 2-beat pulse (often called a **MARCH**)

RHYTHM – A series of sounds or notes of different lengths that create a pattern. A rhythm usually fits with a regular pulse.

Everyday sentences can be used to create rhythms. The patterns made by words create rhythms and this rhythm has a 4-beat pulse:

Music is my favourite



ACCENT – Emphasising or stressing a particular note or notes. Accents affect the **ARTICULATION** and are shown with this symbol >

DURATION – The length of a sound – long/short

TEMPO – The speed of a sound or piece of music – fast/slow

TEXTURE – Layers of sound or how much sound is heard – thick/thin

STRUCTURE – The organisation of sound or how sounds are ordered

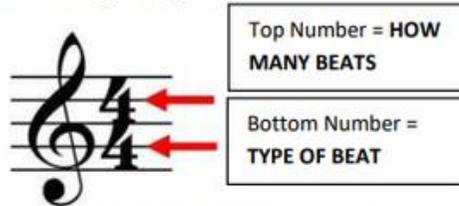
SILENCE – The absence of sound or no sound, shown in music by **RESTS**.

RHYTHM GRID NOTATION – A way of writing down and recording rhythms using boxes



2. TIME SIGNATURES

A **TIME SIGNATURE** tells us how many beats (and what type of beats) there are in each **BAR** of music and is made up of two numbers at the beginning of a piece of music.



2/4 = TWO CROTCHET beats per BAR



e.g. a **MARCH**

3/4 = THREE CROTCHET beats per BAR



e.g. a **WALTZ**

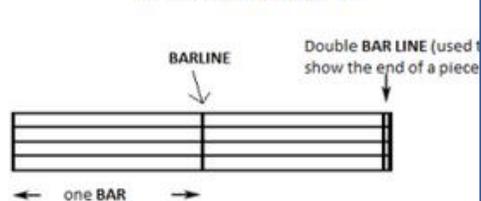
4/4 = FOUR CROTCHET beats per BAR



Bottom Numbers:

2 = Minim 4 = Crotchet 8 = Quaver

BARS AND BARLINES



← one BAR →

3. OSTINATOS, CYCLIC AND POLYRHYTHMS

RHYTHMIC OSTINATO – a short repeated pattern made up of notes of different lengths but without a particular pitch.

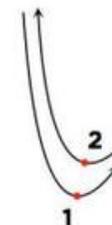
CYCLIC RHYTHM – a rhythm which is repeated over and over again (in a cycle) many times.

POLYRHYTHM - the use of several rhythms performed simultaneously, often overlapping to create a thick, **POLYRHYTHMIC TEXTURE**. A common polyrhythm often used in Latin-American and African Music is to play a 3-beat and 2-beat rhythm simultaneously as shown below. This is called a "3 against 2 Polyrhythm"

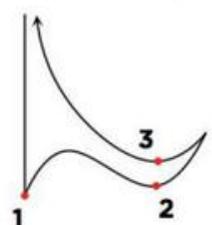
3 beat rhythm	X	X	X	X	X	X	X
2 beat rhythm	X		X		X		X

4. CONDUCTING PULSES AND BEATS

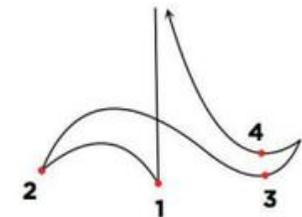
Conducting a 2-beat Pulse/Beat (e.g. a March)



Conducting a 3-beat Pulse/Beat (e.g. a Waltz)

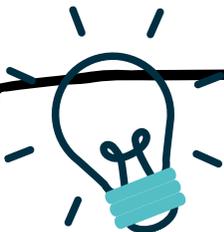


Conducting a 4-beat Pulse/Beat



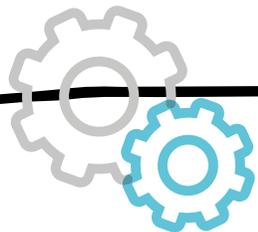
5. NOTE VALUES

Note Name	Note Symbol	Note Value
Semibreve		4 beats
Minim		2 beats
Crotchet		1 beat
Quaver		½ of a beat
Pair of Quavers		2 x ½ beats = 1



KNOW IT

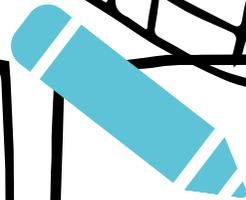
1. Define rhythm.
2. Define pulse.
3. What is an accent? Can you draw the symbol?
4. What is rhythm grid notation?
5. What is the note value of a crochet?
6. What is the note value of a quaver?
7. What is the note value of a minim?
8. Define dynamics
9. What is articulation?
10. Can you explain the difference between tuned and untuned percussion?
11. What is an ostinato?
12. State the four instrumental families.



THINK IT

1. Can you explain the difference between rhythm and pulse?
2. Can you devise a short piece using the rhythm grid below? Choose four actions e.g. clap and draw an appropriate symbol to represent each one.
3. Can you identify the note values of a minim, crochet and pair of quavers and draw the note symbols on the line below?

Pulse	1	2	3	4
1 st rhythm				
2 nd rhythm				
3 rd rhythm				
4 th rhythm				



GRASP IT

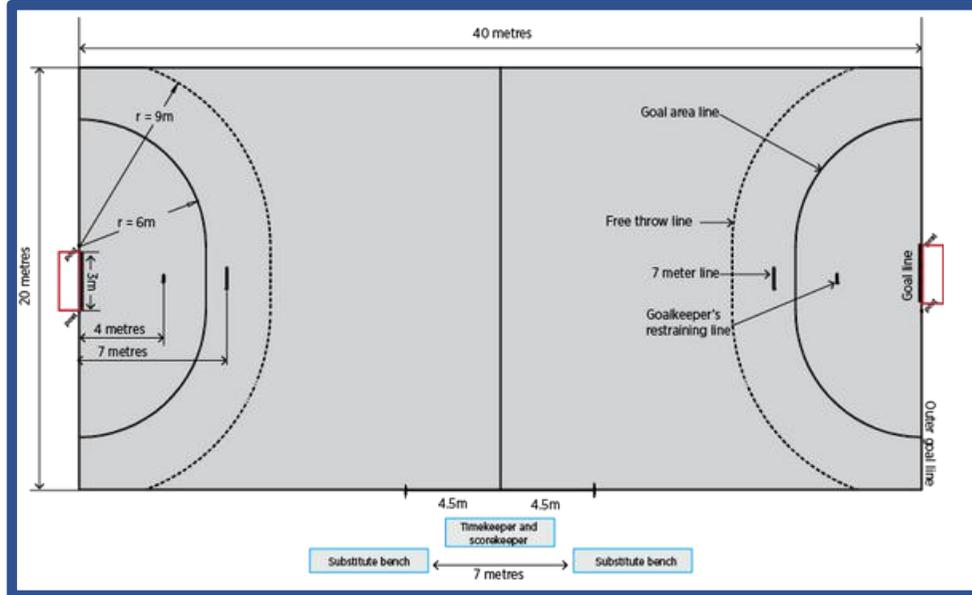
1. Listen to a piece of music of your choice and clap along with the pulse.
2. Listen to a piece of music of your choice and clap along with the pulse, adding in an accent on the first beat of each bar. How many beats are in each bar?
3. Can you explain the term timbre and give an example for each of the instrumental families?
E.g. The clarinet has a mellow timbre.

Physical Education: Handball

Rules

- **Travelling:** take a maximum of three steps when in possession of the ball, after this you must bounce it.
- **Contact/Hitting:** You must not hit the ball out of the hands of an opponent
- **Restraining/holding:** you must not hold, push, run or jump into an opponent
- **Illegal dribble:** you must not bounce the ball, catch it then bounce it again when moving. This is called double dribble.
- **You can hold the ball for three seconds.** After that, you must dribble three times or take three steps. If you hold it for longer it is a foul.
- Only the goalkeeper is allowed to come into contact with the floor of the goal area.

Court



Wow words

Attack **Deception**
Defence
Dribbling **Free throw**
Goalkeeping **Jump shot**
Passing **Left side**
Right side **Travel**
7m penalty throw
Zonal

Game Regulations

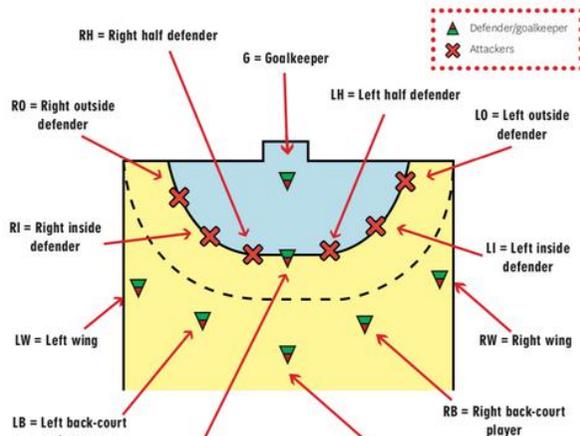
- Junior Players use a size 1 ball up to 14, then a size 2 ball up to 16.
- Each team consists of **7 players**; a goalkeeper and 6 outfield players.
- Outfield players can touch the ball with any part of their body that is above the knee
- The playing court is 40m long and 20m wide, with two goal areas and a playing area.
- The goals are 2m high and 3m wide.

Extra-curricular/satellite club links

Birmingham Handball Club have both boys and girls Under 16's sides.



**ENGLAND
HANDBALL**





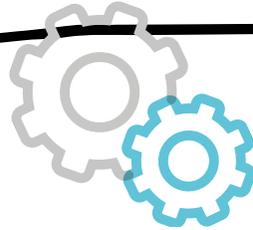
KNOW IT

Technical

1. How must you move with the ball?
2. How many seconds can you hold the ball for?
3. How can I attack space effectively?
4. What methods can I use to intercept the ball?
5. Where can an outfield player not go?
6. Which player can use their feet?

Health, Fitness & Well-Being

7. How can exercise help my well-being?
8. Why do we warm up?
9. How can I train for invasion sports?
10. What are the principles of training?



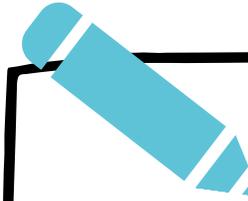
THINK IT

Technical

1. What do we call it when bouncing the ball?
2. Describe three things a player can do when they have the ball.
3. Why is attacking space important?
4. Where should you be to intercept a pass?
5. Give an example of creating space for your sport.
6. Why is this person allowed to use their feet?

Health, Fitness & Well-Being

6. What mental benefits do you get out of playing invasion games?
7. What 3 components of a warm-up should be used?
8. How will this develop my body to give me an advantage?
9. How can they be applied to your training?



GRASP IT

Technical

1. What happens if you dribble the ball, stop, then dribble the ball again?
2. What are your three main options when you receive the ball?
3. Explain a situation where you might do each answer you gave in the question above.

4. Why is there a 7m line?

Health, Fitness & Well-Being

5. How do you think sport will help you improve your physical literacy?
6. Explain a warm-up plan for you to use before a match.
7. Why is muscular endurance a benefit for invasion sports?
9. What will happen to your body if I keep practising my training?



Physical Education: Football

Rules

- **Offside (offence):** when a player goes behind the line of opposing defenders before the ball
- **Handling the ball:** Players are not allowed to use their hands or arms to control the ball unless they are the goalkeeper
- **Throw in:** a throw in occurs when the ball have completed passed the touchline
- **A corner kick** is awarded when the defencing team kicks the ball over the goal line
- **A goal kick** is awarded when a ball passes wholly over the goal line, having last touched an attacking team player has been kicked to them
- **A free kick** is awarded to the opposing team when a player is guilty of an offence
- **A penalty kick** is awarded if a player commits a direct free kick offence inside their penalty area. Goals may be scored directly from a penalty kick.

Positions



Wow Words

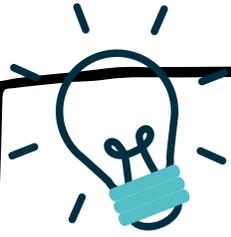
Attacking Balance
Coordination Crossing
Defending
Dominant/ non-dominant foot
Dribble Free Kick
Lofted pass Penalty Shoot
Tackle Throw-in

Regulations

- 2 teams, each with a maximum of eleven players; one must be the goalkeeper
- A match is usually played in two halves, lasting up to a maximum of 45 minutes. This depends on your age.
- A kick-off starts both halves or to restart after a goal is scored.

Extra-Curricular/ Satellite Club Links

- Holly Lane United,
- Sutton United FC,
- Boldmere St Michaels FC,
- Boldmere Falcons FC,
- Sportsco FC,
- Aston Villa KICKS programme
- Find a team near you:
<http://www.birminghamfa.com/players/youth>



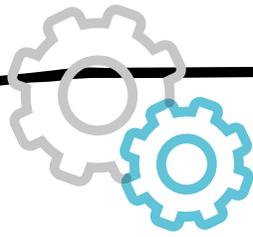
KNOW IT

Technical

1. How do I pass effectively?
2. How can I receive the ball?
3. How can I attack space effectively?
4. What methods can I use to score?
5. How do I create space?

Health, Fitness & Well-Being

6. How can exercise help improve my well-being?
7. How do we warm up?
8. What physical benefits does a warm-up bring?
9. How can I train for invasion sports, like football?
10. What are the principles of training?



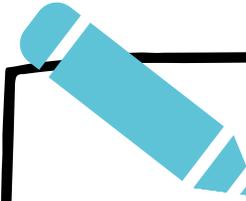
THINK IT

Technical

1. What type of pass is most appropriate in small spaces?
2. Describe three things a player should do to show they are ready to receive the ball.
3. Why is attacking space important?
4. Where should you aim when shooting in football?
5. Give an example of creating space for your sport.

Health, Fitness & Well-Being

6. What benefits do you get out of playing invasion games?
7. What 3 components of a warm-up should be used?
8. How will this develop your body to gain an advantage?
9. How can this be applied to your play?



GRASP IT

Technical

1. Why is it important to give a pass appropriate accuracy and power?
2. How can signally be used to receive the ball in a game situation?
3. What are your three main options when you receive the ball in space?
4. Explain 3 ways to score points in rugby.
5. Why is good _____ at creating space in the game?

Health, Fitness & Well-Being

6. How do you think sport will help you at school?
7. Create a warm-up plan for you to use before a competitive match.
8. Why is muscular endurance a benefit for invasion sports?
9. What will happen to my body if I keep overloading my training?



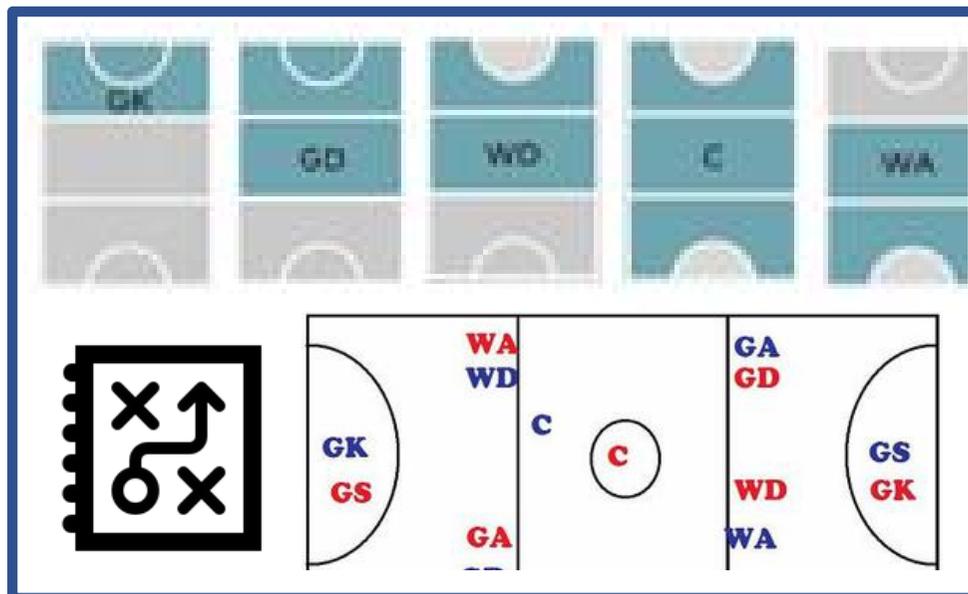
Physical Education: Netball

1. RULES

- **Centre pass:** After each goal is score, play restarts with a centre pass.
- **Contact:** you must not interfere with play by touching, or pushing an opponent.
- **Footwork:** You must not move your landing foot or take 3 steps whilst in possession of the ball
- **Held ball:** You can only hold the ball for 3 seconds
- **Obstruction:** You must be 1 metre away from your opponent before your arms go up and over the ball.
- **Offside:** If you go in an area you're not allowed in, the umpire will call you offside
- **Replaying the ball:** You must not pick the ball up or bounce the ball if you have dropped it.



2. COURT & POSITIONS



3. WOW WORDS

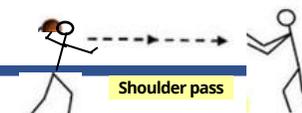
Passing
Contact
Defence
Dodging
Footwork
Held Ball
Interception
Landing
Offside
Pivot
Replaying the ball
Shoulder pass
Change of direction
Marking
Obstruction

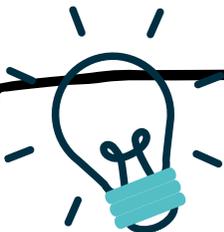
4. REGULATIONS

- 2 teams of 7 players
- A netball court is 30.5m long and 15.25m wide. The longer sides are called the side lines and the shorter sides the goal lines.
- **Scoring**: 1 goal each time the ball passes through the net
- Each team will have the following position;
GK- goal keeper, GD- goal defence, WD- wing defence,
C- centre, WA- wing attack, GA- goal attack
GS- goal shooter

5. EXTRA CURRICULAR ROUTES

- Sutton Town Netball Club;
- [SUTTON TOWN home page \(hitssports.com\)](http://hitssports.com)
- Birmingham Netball Association (15+)
- [Senior Clubs - Birmingham Netball](#)
- Sutton Royals Netball Club
- [Home - Sutton Royals Netball Club](#)
- Wyndley Netball Club
- [Wyndley - Netball West Midlands](#)





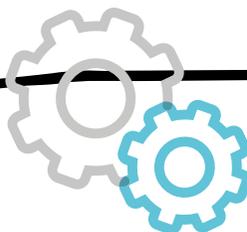
KNOW IT

Technical

1. What are the three types of pass?
2. How can I receive the ball?
3. How can I attack space effectively?
4. What players can I use to score?
5. What player can go in all three thirds of the pitch?

Health, Fitness & Well-Being

6. How can running help improve my well-being?
7. How do we warm up for netball?
8. What physical benefits does a warm-up bring?
9. How can I train for invasion sports, like netball?
10. What are the principles of training?



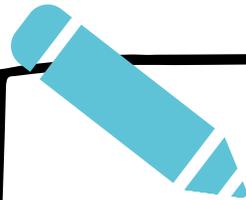
THINK IT

Technical

1. What type of pass is most appropriate in small spaces?
2. Describe three things a player should do to show they are ready to receive the ball.
3. Why is attacking space important as a goal attack?
4. What order of play should you go through? Start from the GK.
5. Give an example of creating space for your sport.

Health, Fitness & Well-Being

6. What benefits do you get out of playing invasion games like netball?
7. What 3 components of a warm-up should be used?
8. How will this develop your body to gain an advantage in netball?
9. How can this be applied to your game?
10. What is your favourite position & why?



GRASP IT

Technical

1. Why is it important to give a pass appropriate accuracy and power?
2. How can signaling be used to receive the ball in a game situation?
3. Who are your main options when you restart from a centre pass?
4. Explain 3 patterns to score points.
5. Why do GS need to be good creating space in the game?

Health, Fitness & Well-Being

6. How do you think this sport will help you at school?
7. Create a warm-up plan for you to use before a competitive match.
8. Why is muscular endurance a benefit for invasion sports?
9. What will happen to your understanding if you play in all the different positions?



Religious Education: Who am I?

1. Who Am I?

- **Fact:** a thing that is known or proved to be true. E.g. the bible is a holy Christian book.
- **Opinion:** a view or judgement formed about something, not necessarily based on fact or knowledge. E.g. it is wrong to live with your partner prior to marriage.
- **Belief:** an acceptance that something exists or is true, especially one without proof. E.g. prayer can make things happen.

2. Who Is My Neighbour?

- A person who lives very close to you.
- The **Parable of the Good Samaritan teaches children a vital lesson in kindness and generosity.**
- This story illustration will help children remember the importance of helping those who are having a hard time whether they are like us or not.



3. What Is My Community?

Community cohesion refers to the aspects of togetherness and bonding exhibited by members of a community, the 'glue' that holds a community together.

In the Islamic faith Ummah or Umma **means** community or people. When it comes to **Islam**, it **means** the whole community of Muslims bound together by ties of religion

4. WOW WORDS

Christianity: Churches

Islam: Mosque

Judaism: Synagogue

Sikhism: Gurdwara

Hinduism: Mandir

Buddhism: Vihara

5. Belonging

- Belonging is about having a secure relationship with or a connection with a particular group of people. Belonging:
- Helps form your identity
- Help you feel part of something bigger and more important
- Is a human need, just like food, water and shelter
- Is a sense of fitting in, like you are a member of an important group.
- Not belonging can lead to isolation and depression.

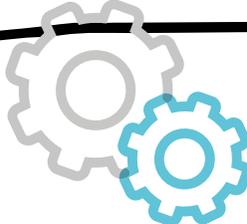
6. How Will I Be Remembered?

- A eulogy, or funeral speech, is an **opportunity to pay tribute to the person who has died**, by giving a short speech about their life and what they meant to you. It's regarded as an honour to be asked to give a eulogy for a loved one or friend.



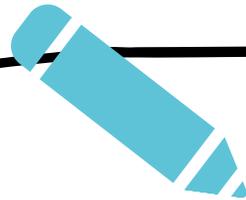
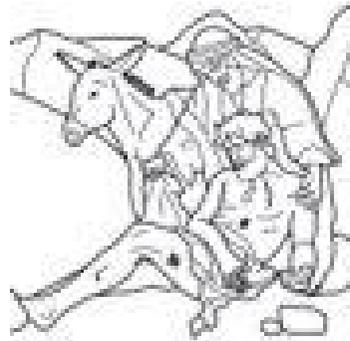
KNOW IT

1. What are the definitions of fact, opinion and belief?
2. Why is belonging important to people?
3. What is Sukkot to a Jewish person?
4. What is the lesson that can be learnt from the parable of the 'Good Samaritan'?
5. What is a eulogy?
6. Where would you go to practice the following faiths?
 - Christianity
 - Buddhism
 - Islam
 - Hinduism
 - Sikhism
 - Judaism
7. What is Ummah?
8. What can bring a community together?



THINK IT

Why is giving a eulogy an honour?
Why is belonging very important for everyone?
What does the parable of the Good Samaritan teach us?



GRASP IT

1. Identify all of the different groups that you belong to.

For one of the groups that you have identified:

2. Why are you a member of this groups?
3. What do the members of this group all have in common?
4. How does it make you feel to be part of this group?
5. How would it make you feel if you could no longer be part of this group?



Science: Cells and Organisation

1. The Skeletal System

Together all the **bones** in your body make up your **skeleton**. Bone is a living tissue. The skeleton has four main functions: 1) support 2) protect vital organs 3) help the body move 4) make blood cells

Joints occur where two or more bones join together.

Three types of joint are: 1) **hinge** joints 2) **ball and socket** joints 3) **fixed** joints. To stop bones rubbing together they are covered with **cartilage**. Bones are held together by **ligaments**.

Muscles are a type of tissue which is made up of lots of muscle **cells**. They are attached to bones by **tendons**. Antagonistic muscles are muscles that work together in pairs e.g. biceps and triceps. When one muscle **contracts**, the other **relaxes**.

All living organisms are made of **cells**. They are the smallest units found in an **organism**.

2. Cell Structure

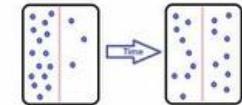
Structure	Function	Animal Cells	Plant Cells	Bacterial Cells
1. Nucleus	Contains the genetic information that controls the functions of the cell.	Y	Y	
2. Cell Membrane	Controls what enters & leaves the cell.	Y	Y	Y
3 Cytoplasm	Where many cell activities & reactions happen.	Y	Y	Y
4 Mitochondria	Provides energy from aerobic respiration .	Y	Y	
5 Ribosomes	Make proteins- site of protein synthesis .	Y	Y	Y
6 Chloroplast	Where photosynthesis occurs.		Y	
7 Vacuole	Use to store water & other chemicals as cell sap .		Y	
8 Cell Wall	Strengthens & supports the cell (made of cellulose in plants)		Y	Y
9 DNA Loop	A loop of DNA NOT in a nucleus.			Y
10 Plasmid	A small circle of DNA , may contain genes associated with antibiotic resistance.			Y

3. WOW WORDS

Substances move in and out of cells by **DIFFUSION**.

Diffusion is the movement of **PARTICLES** from a place where they are in a high **CONCENTRATION** to a place where they are in a low concentration.

The concentration of a substance means the number of particles of a substance present in an area.



4. Microscopes and Magnification

To see a very small object in detail, you need to use a **microscope**. This **magnifies** the image using lenses. Looking carefully and in detail at an object is called making an **observation**. To calculate total magnification:

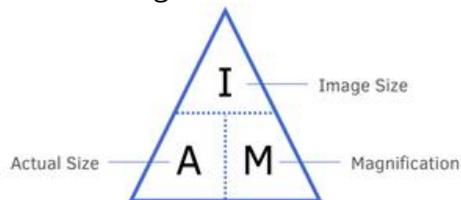
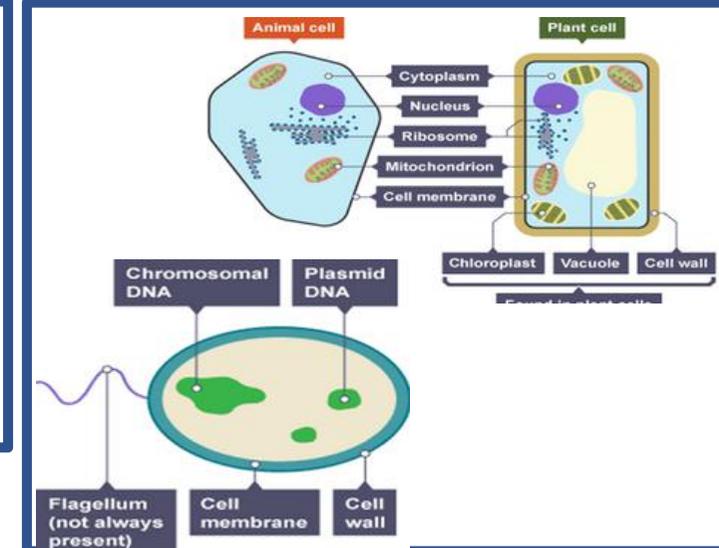


Fig 2. Formula Triangle for Magnification.

5. Specialised Cells

Sperm Cell	Acrosome contains enzyme to break into egg, tail to swim. Many mitochondria to provide energy.
Egg Cell	Cytoplasm contains nutrients for growth of the embryo. Nucleus contains the genetic material
Root Hair Cell	Long extension to provide a large surface area for water & mineral absorption- thin cell wall.
Red Blood Cell	No nucleus to allow space for oxygen
Nerve Cell	Long to transmit electrical impulses across a distance.

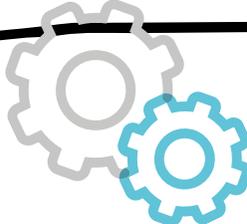
6. Labelling Cells





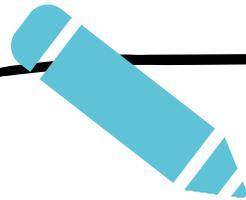
KNOW IT

1. Write a definition of a cell.
2. Draw a labelled diagram of an animal cell.
3. Which part of a cell controls what enters and leaves the cell?
4. Describe the function of the nucleus.
5. Describe the function of the cytoplasm.
6. Describe the function of chloroplasts.
7. Describe the function of the cell wall.
8. What organelles are only found in plant cells?
9. Write a definition of a specialised cell.
10. What are joints?



THINK IT

1. Explain how a root hair cell is adapted for its function.
2. Explain how a sperm cell is adapted for its function.
3. Explain how a palisade cell is adapted for its function.
4. Describe what diffusion is.
5. Describe the factors that could affect the rate of diffusion.
6. Describe two examples of diffusion in plants and animals.
7. Describe how you would view plant cells under the light microscope.
8. Explain why iodine is added to your plant cell sample when viewing plant cells under the microscope.
9. Write the equation for calculating magnification.
10. State the names of the three types of joints in the human body



GRASP IT

1. Describe the organisation of a multicellular organism
2. Explain how a cell becomes specialised.
3. Explain why plant cells contain organelles that animal cells do not.
4. Write a comparison of plant cells, animal cells and bacteria cells.
5. Compare the light microscope and the electron microscope.
6. Explain the importance of diffusion in animal or plant cells
7. Explain why root hair cells do not contain chloroplasts.
8. Describe the importance of ligaments.
9. Explain two examples of cells which have high numbers of mitochondria.
10. Explain how antagonistic muscles work

Science: Forces

Forces Section 1

Forces can be measured using a newton meter. Forces are measured in newtons (N).

Contact forces occur when objects are touching, for example:

- friction
- drag forces (air resistance and water resistance)
- support forces (e.g., reaction forces)

Non-contact forces work at a distance, for example:

- gravity • magnetic force • electrostatic force

Forces always occur in pairs. The pairs are called interaction pairs.

Section 3 Floating and sinking

If the upthrust is larger than the weight of the object, the object will rise.

If the upthrust is less than the weight of the object, the object will sink.



Section 2 Balanced and unbalanced forces

When forces acting on an object are the same size, but acting in different directions, we say that they are balanced

When forces are balanced, the object is either not moving (stationary) or moving at a constant speed

When the two forces acting on an object are not the same size, we say that the forces are unbalanced

When forces are unbalanced, the object will either be in acceleration or deceleration

The resultant force is the difference



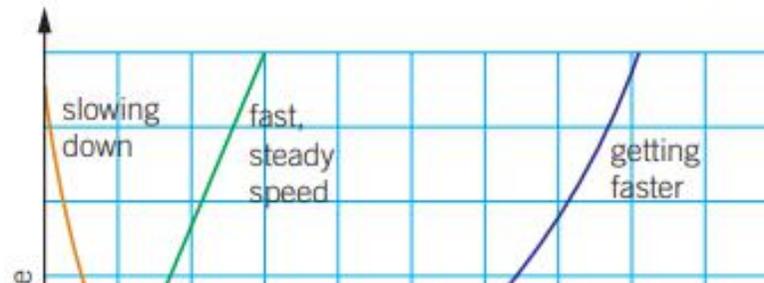
Section 4 Speed distance graphs

Speed is a measure of how quickly or slowly that something is moving.

We measure speed in meters per second (m/s), this means that distance must be in meters and time must be in seconds

We calculate speed with the following formula: $\text{speed (m/s)} = \frac{\text{distance travelled (m)}}{\text{time taken (s)}}$

Distance-time graphs tell the story of a journey, they show how much distance has been covered in a certain period of time



3. WOW WORDS

Forces: Forces can make things speed up, slow down, change direction or change shape

Newtons: The units for measuring forces
Mass The amount of matter something is made of

Weight: The force that acts on a mass because of gravity:

Balanced forces: When opposing forces on an object are equal.

Unbalanced force: When opposing forces on an object are unequal

Resultant forces: The overall result of the forces on an object – It is represented as a number/arrow

Section 5 Weight and mass

Weight and mass

Mass is the amount of 'stuff' something is made of – it is measured in kilograms (kg). Weight is a force so it is measured in newtons.

$\text{weight (N)} = \text{mass (kg)} \times (\text{N/kg})$

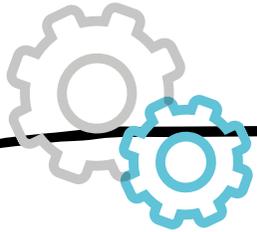
The gravitational field strength on Earth is about 10 N/kg.

Your weight depends on the gravitational field strength but your mass is the same everywhere.



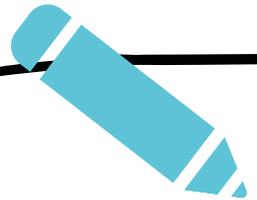
KNOW IT

1. What are units for force?
2. What instrument is used to measure force?
3. Identify forces?
4. Describe the effect of forces on objects?
5. Describe the difference between contact and non-contact forces?
6. Identify some contact forces?
7. Identify some non-contact forces?
8. Describe the difference between a balanced and an unbalanced force?
9. What is the equation used to measure speed?
10. How are forces represented in diagrams?
11. Describe what arrows show on force diagrams?
12. Identify variables.
13. Describe the difference between variables?



THINK IT

1. Describe why objects float?
 2. Describe why objects sink
 3. What is meant by the resultant force?
 4. Explain the difference between mass and weight?
 5. Describe the motion of the following object:
 - a.) the forward thrust on a car is greater than air resistance?
 - b.) the air resistance is greater than forward thrust?
 - c.) the forward thrust and air resistance are equal.
1. Calculate the speed of the following objects:
 - a.) Calculate the speed of a sprinter who ran 100m in 15 seconds.
 - b.) A car travels a distance of 100 metres in 20 seconds. What is the speed of the car?
 - c.) A bike travels at a speed of 20 m/s for 20 seconds. How far does the bike travel in this time?

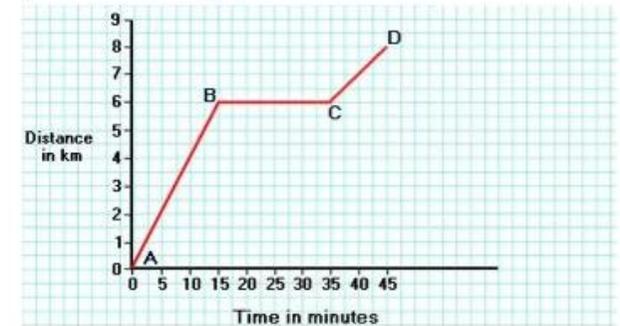


GRASP IT

1. What is density?
2. How is density calculated?
3. Calculate the density of the different objects

Object	Mass (g)	Volume (cm ³)	Density (g/cm ³)	Sink/float
Iron	140	60	2.33	
Cork	0.9	1.9	0.47	
Polystyrene	1.1	2.3	0.48	
Perspex	50.7	30.2	1.67	
Wood	0.7	1.2	0.58	
	67.8	41.0	1.65	

4. Explain the journey of the car, at point A-D on the speed distance graph?



5. Calculate the average speed?
6. At which point will the car travel the fastest?

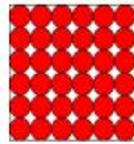
Science: Particles

1. The Three State of Matter

Materials come in 3 different forms - solid, liquid and gases. These are what we call the 3 states of matter. The particles in a solid are held by strong forces of attraction. They cannot move, they vibrate around a fixed position. Liquids are also held together by strong forces of attraction between the particles. They can move so they don't have a fixed shape. They can fill the bottom of the container. The particles in a gas have weak forces between the particles.

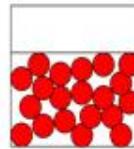
2. Properties of the States of Matter

The solids, liquids and gases can be recognised by their different properties. A property describes what a substance looks like or how it behaves.



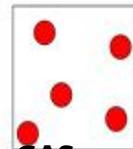
SOLID

Fixed shape
Fixed volume
Cannot be compressed



LIQUID

Can flow
Fixed volume
Take the shape of the container
Cannot be compressed



GAS

Take the shape of the container
Can be compressed
Hard to store

3. WOW WORDS

Melting = A solid turning into a liquid.

Evaporation = A liquid turning into a gas.

Freezing = a liquid turning into a solid.

Condensing = a gas turning into liquid.

Property = describes what something looks like or how it reacts.

Atom = the basic unit of matter.

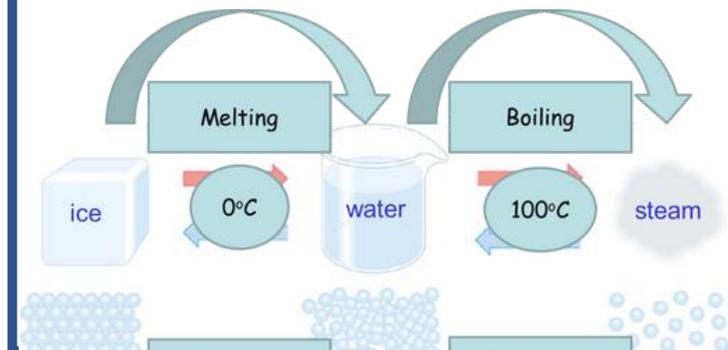
Molecule = Two or more atoms chemically joined together.

4. Physical changes

Solids, liquids and gases can change state e.g. a solid can change into a liquid and back again. When a solid is heated, it makes the particles move more and weakens the forces holding the particles together and eventually they break free forming a liquid. If we continue heating it, the particles move even faster and the forces holding the liquid together weaken and break free forming a gas. When you freeze water, the particles **expand**. The particles within it **slow down** due to the decrease in temperature.

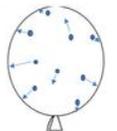
5. Changing state

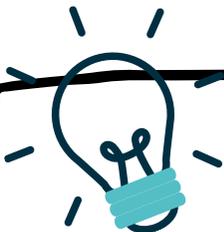
The model shows the four processes of changing state. They are melting, boiling, freezing and condensing.



Diffusion and Gas Pressure

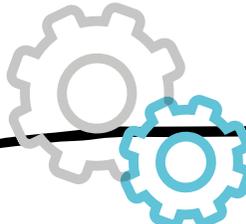
Gas Pressure is due to the particles hitting a surface. Increasing the temperature can increase the pressure because the particles move more and hit the wall harder. The gas particles have lots of energy and can move freely. These push against the sides of the balloon. Diffusion is the particles spreading out. Particles move from an area of high concentration to low concentration. An example of this is smell spreading through a room. The factors that can increase diffusion are temperature, concentration and surface area.





KNOW IT

1. What is a molecule?
2. Draw a model of a solid.
3. Draw a model of a liquid.
4. Draw a model of a gas.
5. What happens to the particles when energy is given?
6. Identify the name of the process when a solid turns to a liquid.
7. Identify the name of the process when a gas turns to a liquid.
8. Identify the name of the process when a liquid turns to a gas.
10. Identify the name of the process when a solid turns to a gas.



THINK IT

1. Describe the arrangement of particles in a solid.
2. Describe the arrangement of particles in a liquid.
3. Describe the arrangement of particles in a gas.
4. Describe the movement of particles in a solid.
5. Describe the movement of particles in a liquid.
6. Describe the movement of particles in a gas.
7. Explain how gases exert pressure
8. Describe how particles move via diffusion
9. Explain how particles change state from solid to liquid with reference to energy.
10. Explain how particles change state from gas to liquid with reference to energy.



GRASP IT

1. Explain whether you think slime is a solid or a liquid.
2. Explain how increasing the number of particles in a container increases the pressure.
3. Explain why higher temperature increases the rate of diffusion.
4. What is the difference between evaporation and boiling.
5. Research three examples of substances that sublime.
6. Explain why particles in gaseous state diffuse quicker than those in a liquid state
7. Explain why placing an empty bottle with the lid on in a freezer make it collapse?
8. Explain how pressure increases with an increase in temperature.
9. Explain why a balloon increases in size when you blow more air into it.
10. Explain why race car technicians put a lower air pressure into their tyres before a race.

Science: How Science Works.

SECTION 1: Variables

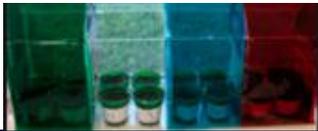
Before you start an experiment, you need to know what you are trying to find out and work out what your variables are. We need to change and control the right variables to get valid results. Look at the example below:

In this experiment I want to see how different coloured light affects plant growth.

Independent variable – colour of light

Dependent variable – growth of plant (e.g. I could measure the height of each plant every week)

Control variables – I need to make sure that nothing apart from the light is affecting the plants growth so I need to control other factors such as room temperature, soil type and amount of water they are given.



SECTION 2: Writing a suitable method

It is important to write detailed step-by-step methods for all scientific experiments. This is so that other scientists can repeat your experiments later to see if your data is reproducible.

For this experiment the method might look like this:

1. Collect the 4 different coloured Perspex containers and place them in the same part of a room so that the temperature is the same in each box
2. Number each plant pot with a different number from 1-16. Measure the height of each plant and record the results (they should all be roughly the same height)
3. Place 4 plant pots into each coloured Perspex container. Give each plant 30ml of water per day.
4. Measure and record the height of each plant at the same time every week for 6 weeks.

3. WOW WORDS

- **Variables** – things that can change during your experiment
- **Independent variable** – the thing you deliberately change to see its effect
- **Dependent variable** – this changes depending on your independent variable, this is the variable that you measure
- **Control variable** – these are the things that you try to keep the same throughout the whole experiment so that your test is reproducible.
- **Diagram** – a labelled scientific drawing
- **Method** – a list of step-by-step instructions that tell you how to do an experiment
- **Results** – your results are your observations and measurements of your dependent variable
- **Analysis** – once you have your results you should look for patterns or trends. It is often useful to draw a graph to make it easier to spot these. This is called your analysis
- **Conclusion** – a conclusion explains what we have learnt from an experiment, for example, how the independent variable affects the dependent variable
- **Evaluation** – your evaluation should discuss the strengths and limitations of your experiment and suggest how you could improve your results or take your research further.

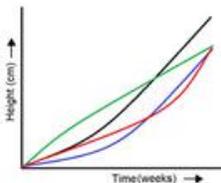
SECTION 3: Analysing data and drawing conclusions

We need to **analyse** our results to understand what they mean. In this experiment we had 4 plants in each coloured box so we could calculate the average height for the plants in each box (by adding their heights together and dividing by 4) each week. Or we could work out the amount of growth each week rather than the total height, and again average it for each colour.

Finally, we can display our results in a chart or graph. The graph below shows the average plant height against time for plants in each coloured block.

From these results we can see that plants grow quicker in green light at first.

Growth in red and blue light is slower to start with but speeds up later and plants in the clear block grew tallest overall.



SECTION 4: Evaluating your work

Once you have analysed your results it is important to think about your next steps. Let's look at this experiment again.

The **control variables**: To make this test fairer we could control more of the environmental variables such as:

Temperature (by measuring the temperature in each box at set intervals to ensure that they are the same, and taking steps to correct it if they are not)

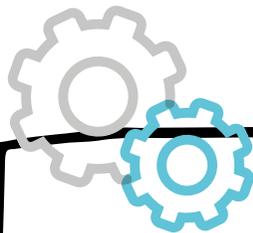
Amount of light (by using an electric light source in an otherwise dark room for example rather than sunlight which can vary)

Our next steps: We could use our observations about the different coloured light to design a new experiment where we try to achieve maximum plant growth by changing the light colours at different development stages.



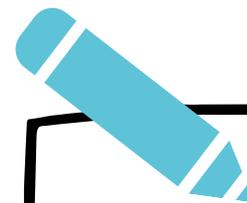
KNOW IT

1. What is the independent variable?
2. What is the dependent variable?
3. List any control variables
4. Write a simple method
5. Draw a simple results table
6. How many times do you think you should do the experiment?
7. What kind of chart or graph could you use to display your results?
8. How could you improve this experiment?



THINK IT

1. List as many control variables as you can and explain how we will control them
2. How will we accurately measure the dependent variable?
3. Explain why it is important to repeat the experiment more than once.
4. Write a step-by-step method for this experiment that could be accurately followed by someone else, include all measurements.
5. Draw a results table, make sure you include room for working out the mean average for your results.
6. Explain how you will display and analyse the results from your experiment.
7. How can you make sure that your results are repeatable?
8. How can you make sure that your measurements are precise and accurate?



GRASP IT

1. Find out what the following key terms mean: Precise, accurate, repeatable, reproducible, systematic error, random error. Write definitions for each of these terms and give an example relating to this experiment.
2. Design a complex results table capable of recording several different surface areas (such as halved and quartered tablets as well as powdered) and multiple repeats for calculating a mean average.
3. Carry out research to find out why increasing the surface area of a solid affects the rate of a reaction (link to particle theory)
4. Think about some of the variables you have said you are going to control. Carry out research to see how your experiment might be affected if you don't control them.
5. Carry out research to find out why crushing a solid increases its surface area (link to particle theory)
6. Will your experiment yield categoric or continuous data? What is the best way to display this type of data? Why?

Technology: Technical Drawing

1. Technical Drawing

Technical drawing is a style of drawing used by **designers** and **engineers** to **communicate** design ideas to a **client** or **manufacturer**.

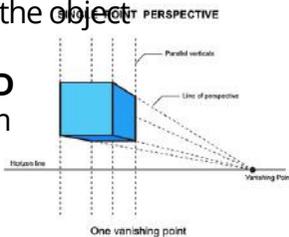
It is used to produce **3D** and **realistic** drawings. You will learn 2-point perspective, 1-point perspective and Isometric style. To draw complex **3D** shapes you must be able to draw simple **2D** shapes accurately.

We **measure** using **millimeters** in design and technology for accuracy. Specialist tools and equipment: **ruler**, **protractor**, **set square** and **isosketch**.

4. 1-Point Perspective

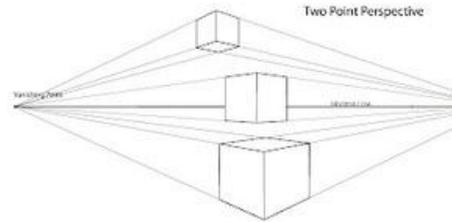
1-Point perspective drawing rules: draw the **horizon line**, plot the **vanishing point**, draw the **frontal plane**, draw lines from **corners/edges** of the front plane to **recede** back to the VP, add **depth** to the object.

- Make it **3D**.
Objects appear **3D** and **realistic** from the **viewpoint** of **one person**.



2. 2-Point Perspective Drawing

2-Point perspective drawing rules: draw the **horizon line**, plot the **vanishing points**, draw the **front edge** of the shape, draw lines from the top and bottom of the front edge to **recede** back to **both VP's**, add **depth** to the object - make it **3D**. Objects appear **3D** and **realistic**.



They can be drawn at **different levels: above, on or below** the horizon line to show different **views** of the product. These **rules/guidelines** can be followed for drawing both **shapes** and more **complicated products**.

5. Isometric Drawing

Isometric drawing rules: draw a reference line **horizontally**, draw the front edge **vertically**, mark out **30 degrees** and draw a line through, draw a "Y" shape, by marking out **30 degrees** in the other direction, draw **two straight lines** the **same length** as the **front edge**, join the lines.

All lines will be **parallel** on the same drawing **planes**. Objects will look **3D** but not **realistic**.



3. WOW WORDS

Horizon Line = A temporary horizontal line drawn across the page to set the height the viewer will see your drawing.

Vanishing Points = The point where all lines converge and disappear.

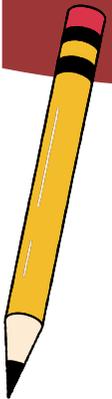
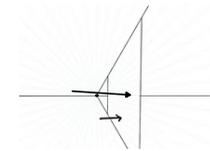
Parallel = Two lines that will never meet.

Construction lines = Lines which are drawn to help build the shape, these should be drawn lightly so that they can be removed.

Isometric = equal measurements or dimensions.

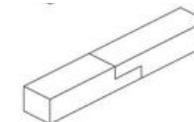
Millimeters = 10mm = 1cm

Plane = A face of a shape/ an axis to draw on

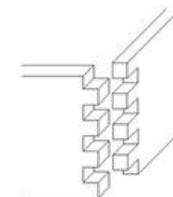


6. Wood Joints

Wood joints are a traditional method of **joining timber**. There are a range of different joints that can be used for different situations that provide a variety of levels of **strength**. Joints are often **glued** to make them **secure** and **permanent**.



Half-lap joint

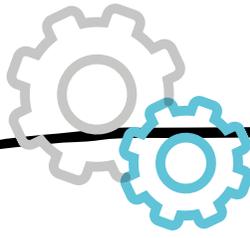


Finger/comb joint



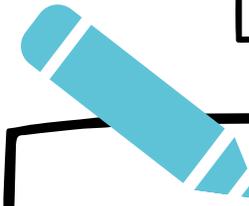
KNOW IT

1. Explain what technical drawing is.
2. Explain what industries use technical drawing and why.
3. Measure and draw out 2D shapes accurately.
4. State the rules of 2-point perspective drawing.
5. State the rules of 1-point perspective drawing.
6. State the rules to draw in isometric.
7. State the angles associated with isometric drawing.
8. State the names of specialist tools and equipment needed to complete these drawings.
9. State how to measure using a ruler and in what measurements we use in design and technology.
10. How to work out the area of a shape.
11. How to convert centimetres into millimetres.
12. How to use angles on a protractor.



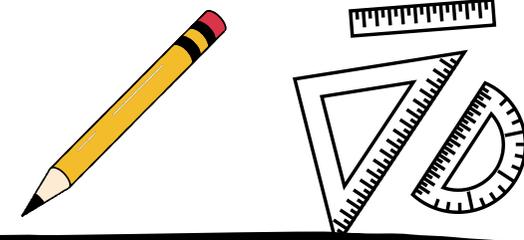
THINK IT

1. Can you draw out basic shapes in 2D accurately?
2. Can you follow the rules of 2-point perspective drawing to draw basic shapes in different dimensions: 40mm cube, 20 x 60mm cuboid?
3. Can you follow the rules of 1-point perspective drawing to draw basic shapes in different dimensions: 10mm cube, 15 x 35mm cuboid, 50mm triangular prism?
4. Can you follow the rules of isometric drawing to draw basic shapes in different dimensions? Cube: 50, 65, 90mm.
5. Can you render (colour using shade and tone) basic shapes in 3D to show light, dark and shade on a 3D object?
6. Consider the purpose of 2-point perspective drawing?
7. Consider the purpose of 1-point perspective drawing?
8. Consider the purpose of isometric drawing?



GRASP IT

1. Draw out a 2D square in 20mm, 40mm 65mm.
2. Break down complex shapes into simple shapes and follow the rules of 2-point perspective to draw products, draw a table.
3. Break down complex shapes into simple shapes and follow the rules of 1-point perspective to draw to products, draw a chair.
4. Break down complex shapes into simple shapes and follow the rules of isometric to draw products, draw a mobile phone.
5. Add detail, material finish (timber, plastic, metal), patterns and logos to products in the correct drawing style following the relevant rules.



Mathematics: Hegarty Maths

Homework Guidance

One task is set per class using www.hegartymaths.com

The homework task is always set at the start of the week and due in at the start of the following week.

Student expectations:

Watch the video for the set task

Make clear notes from the video

Complete the task, aiming for 80% as a minimum

If a student is struggling with the task, use the building blocks to aid prior learning

When completing the quiz, use the video given for the task. Find the part of the video that answers a similar question and use this to help by following the methods used.

Learning maths is like learning anything. You need to practise and always put in effort. Trying your best and always putting in effort is crucial to the process. HegartyMaths is totally committed to helping students improve at maths.

I was in the bottom set in maths in my school. I started doing lots of HegartyMaths and got better at maths. My teacher saw my progress in HegartyMaths and combined with my end of term assessment I was moved up two sets!

Happy Student @ Weston Community School

HegartyMaths is an amazing place to learn new things it shown me the best videos on how to work out the hardest questions

Happy Student @ Harris Academy Merton

Doing a task

Watch the video carefully taking the best notes you can. Use lots of colour and work hard to follow each example. Replay anything you might be unsure of.

Work on your **building blocks**. If you struggle with the video then improving these will help you access the task better. Aim to make all building blocks 100%.

Did you understand the video?

No

Yes

Do quiz

What score did you get in the quiz?

100%

Great effort! Why not try the next HW or improve some of your other scores.

70 - 99%

Try the quiz again and work hard to learn from any previous mistakes.

Below 70%

Don't give up. If you have taken full notes of the video, worked on your building blocks and you're still struggling then leave comments for your teacher to ask for help. It's important you make sure you ask your teacher for help to make sure you can eventually get 100%.