



YEAR 7 KNOWLEDGE ORGANISER

TRINITY TERM

Name:

Family Group:



LEARNING - LOVING - LIVING



PAGE NUMBER	SUBJECT	TOPIC
1-3	General information	Knowledge Organiser guidance, Retrieval activity ideas, The science of Learning- How to revise effectively
4-6	English	Antigone
7-8	Mathematics	Solving equations, Angle properties and Data Handling
9-17	Science	The Periodic Table, Forces, Plants, Conservation, Space
18-19	Geography	Ice Age in the UK, Russia and Energy
20-21	History	The Stuarts and The English Civil War , The British Empire
22-24	Religious Education	Hinduism, Sikhism, Christianity
25-26	Physical Education	Athletics, Striking and Fielding
27-29	Computer Science	Programming, Computers
30-32	Drama	Trainers a true story, Technical Theatre, Proscenium Arch and stage positions
33-34	Music	Tonalities, Structure
35	Art	Pop Art
36	Engineering	Engineering
37	Food and Nutrition	Healthy Eating
38-39	French	Vocabularies 321
40-42	Spanish	Vocabulario Mi ciudad
43-44	PSHE	Health and Well-being

KNOWLEDGE ORGANISER GUIDANCE

The knowledge organiser is a book that sets out the **important, useful** and **powerful knowledge** of a single topic on one page.

When used effectively, Knowledge Organisers are useful in:

- Helping build a foundation of **factual knowledge**.
- Embedding **revision techniques** for now and future studies (A-Level, College, University)
- Allowing knowledge to become stored in **long term memory** which frees up working memory for more complex ideas. It also allows you to connect concepts together, even across subjects

HOMEWORK EXPECTATIONS

EACH NIGHT you should spend *at least 1 hour* per night on homework. 3 subjects per night x 20 minutes per subject = 1 hour. Use the homework timetable as a guide to what subjects to complete each night.

Complete all work in your exercise book and make sure you bring your knowledge organiser to school EVERYDAY (in your coloured folder).

Every FRIDAY morning the week's worth of KNOWLEDGE ORGANISER homework will be checked in Family Group time and detentions issued for work not complete, or not up to standard.

SUBJECT HOMEWORK

All students will also be assigned **ENGLISH** reading activities on www.CommonLit.org with each assignment taking 20-30 minutes to complete and **MATHS** activities with short explanatory videos on the online platform of <https://mathswatch.co.uk>.

It is also recommended to take advantage of FREE online revision tools such as www.senecalearning.com or the recently updated BBC BITESIZE.

It is also recommended that students regularly **READ** a variety of **fiction and non fiction books** of their choosing. This extra reading will develop and broaden general understanding and context in all subjects.



LEARNING - LOVING - LIVING

HOMEWORK TIMETABLE

Year 7	Subject 1	Subject 2	Subject 3
Monday	Maths	History	PE
Tuesday	English	Geography	ICT
Wednesday	Maths	RE	Music
Thursday	English	Science	Creative
Friday	Maths	Languages	Drama

EQUIPMENT CHECKLIST

Pencil case	Knowledge Organiser	2 Black or Blue pens
2 pencils and Eraser	Green Pen	Pencil Sharpener
Mini whiteboard and pen	Calculator	Ruler
Maths geometry set	Class book	

HOMEWORK CHECKLIST

Week 1	Week 2	Week 3	Week 4	Week 5	
Half term					
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6

Here are some activities that you can try at home with your knowledge organiser to help revise. There are even more strategies on page 3.

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4 Methods of Retrieval Practice

@ImpactWales

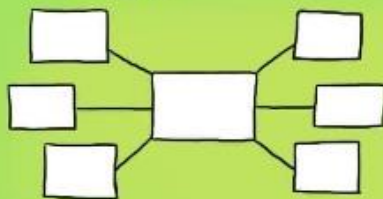
Before you start put away all your books & classroom materials.

Retrieval Practice Examples

- * Exit Tickets
- * Starter quizzes
- * Multiple choice quizzes
- * Short answer tests
- * Free write
- * Think, pair, share
- * Ranking & sorting
- * Challenge grids

BRAIN DUMP

Write, draw a picture, create a mind-map on everything you know about a topic.



Give yourself a time limit, say 3 minutes, then have a look at your books & add a few things you forgot.

QUIZZING

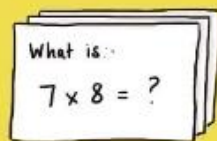
Create practice questions on a topic. Swap your questions with a partner & answer.

Question - What is a metaphor?

- ☐ A comparison using 'like, as, than'.
- ☐ A comparison where one thing is another.
- ☐ A comparison with a human attribute.

FLASHCARDS

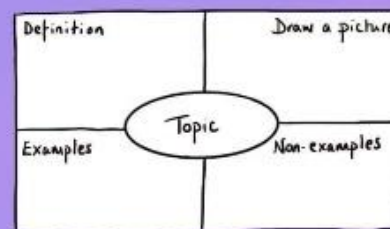
Create your own flashcards, question on one side answer on the other. Can you make links between the cards?



You need to repeat the Q&A process for flashcards you fail on more frequently & less frequently for those you answer correctly

KNOWLEDGE ORGANISERS

Complete a knowledge organiser template for key information about a topic.



You can use knowledge organisers to learn new vocab & make links in between subjects or ideas.

After you have retrieved as much as you can go back to your books & check what you've missed. Next time focus on that missing information



DUAL CODING

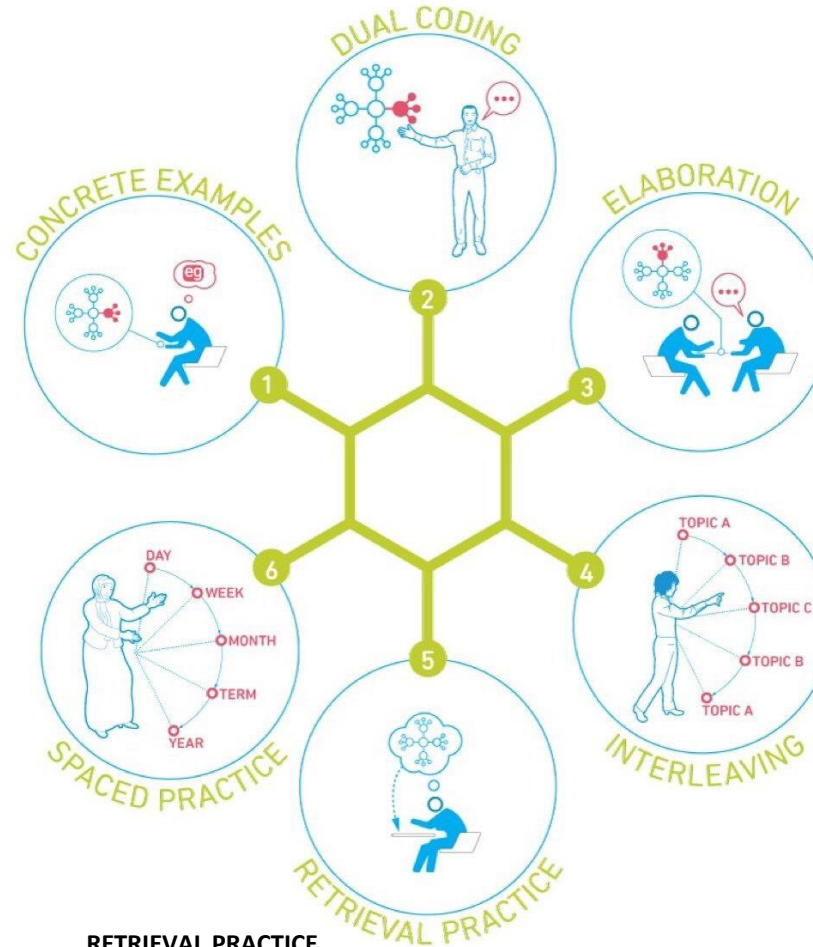
Dual coding is the process of combining visual and written materials. You can visually represent materials using methods such as infographics, timelines, cartoon/comic strips, diagrams and graphic organisers. Combining images with words or explaining an image makes it more likely to 'stick'.

CONCRETE EXAMPLES

When you're studying, try to think about how you can turn ideas you're learning into concrete examples. Making a link between the idea you're studying and a real life example, concrete example, can help students understand abstract ideas and make it 'stick'.

SPACED PRACTISE

Divide up your revision into short manageable chunks of time. When revising aim for 20 - 30 minutes per session. Five hours spread out over two weeks is better than the same five hours all at once. This is **spaced practice** and it is regarded as one of the most effective revision strategies.



RETRIEVAL PRACTICE

Through the act of retrieval, or calling information to mind, our memory for that information is strengthened and forgetting is less likely to occur. Retrieval practice ideas include: Read, cover, write, check, flashcards and brain dumps.

ELABORATION

When talking about studying, elaboration involves explaining and describing ideas with many details. Elaboration also involves making connections among ideas you are trying to learn. Ask yourself questions about a topic to delve deeper. The more information you have about a specific topic the stronger your grasp and ability to recall.

INTERLEAVING

Interleaving is a process where you combine multiple subjects and topics while you study in order to improve learning. Switch between ideas and make links between them during a study session. Interleaving has been shown to lead to better long-term retention



Context	Definition	Key Characters	
1) Sophocles	Ancient Greek dramatist	1) Antigone	The tragic heroine of the play. The daughter of Oedipus
2) Thebes	A Greek city state in which the events of Antigone occur.	2) Creon	Antigone's uncle. The ruler of Thebes.
3) Polis	Greek city states	3) Eurydice	Creon's wife.
4) Patriarchy	A system of society or government in which men hold power	4) Ismene	Antigone's sister.
5) Great Dionysia	Ancient dramatic festival held in Athens in honour of Dionysus, the god of wine. Tragic and comic drama originated here.	5) Haemon	Son of Creon and Eurydice, betrothed to Antigone. His name means blood.
6) Theban Plays	Three plays concerning the fate of Thebes	6) Polynices	Antigone's brother. Killed by Eteocles before the play starts. Creon decrees that Polynices is not to be buried or mourned. Viewed as a traitor to the state.
7) Oedipus Rex	The story of Oedipus as king. He accidentally fulfils the prophecy made at his birth that he would kill his father and marry his mother.	7) Eteocles	Brother of Polynices. Killed by Polynices but is given proper burial rites.
8) Oedipus at Colonus	The banished Oedipus and his daughter Antigone arrive at the town of Colonus. Oedipus dies.	8) Teiresias	Blind prophet of Apollo.
9) Antigone	Story of Antigone's defiance against Creon's decree that Polynices is not to be buried.	9) Oedipus	The father of Antigone. Tragic hero who fulfilled a prophecy that he would kill his father and marry his mother.
Structure of Tragedy	Definition	Elements of Tragedy	
1) Hamartia	Tragic flaw	1) Tragedy	A play dealing with tragic events, especially one concerning the downfall of the main character.
2) Anagnorisis	Protagonists undergo a process of recognition in which they see their nature and destiny more clearly than before.	2) Antithesis	Direct opposites.
3) Peripeteia	Sudden reversal of fortune or change in circumstances	3) Chorus	Group of actors who described and commented on the main action of a play.
4) Catastrophe	Final event of dramatic action	4) Dramatic Irony	The full significance of a character's words or actions is clear to the audience but not to the character.
5) Resolution	Problem of the story is resolved or worked out	5) Protagonist	Main character in a story
6) Catharsis	Release of powerful, healing emotions.	6) Antagonist	A person who actively opposes or is hostile to someone.
Themes	Definition	Themes	Definition
1) Hubris	Excessive pride or self-confidence	7) Sacrilege	Violation or misuse of what is regarded as sacred
2) Tyranny	Cruel and oppressive government or rule	8) Loyalty	Strong feeling of support or allegiance
3) Divine Law	Rule that is believed to come from God or the gods.	9) Ostracism	Exclusion from a society or a group.
4) Civil authority	Power of command which a State exercises over its members.	10) Patricide	Murder of one's father
5) Anarchy	State of disorder due to absence or non-recognition of authority	11) Fate	Destined to happen
6) Patriot	Person who vigorously supports their country	12) Natural Rights	Rights that are universal and inalienable
		13) Edict	An official order issued by a person in authority.

Key Vocabulary		Definition	
1) Inhibiting	Hinder, restrain	23) Microcosm	A representation of something on a much smaller scale
2) Overbear	Overwhelm, bring down with superior weight or force	24) Insolence	Rude and disrespectful behaviour
3) Legitimate	Conforming to law or rules	25) Obstinate	Stubbornly refusing to change one's opinion or chosen course of action
4) Vindication	Proof that something is right, reasonable	26) Impudent	Not showing due respect for another person; impertinent
5) Antinomies	A contradiction between two beliefs that are, in themselves, reasonable	27) Proclamation	A public announcement or declaration
6) Authoritarian	Favouring strict obedience	28) Annihilate	Utterly destroy
7) Fundamental	Of central importance	29) Treachery	Betrayal of trust
8) Dichotomy	A contrast between two things which are entirely different	30) Revere	Feel deep respect or admiration for
9) Audacity	Showing a willingness to take surprisingly bold risks	31) Deity	A god
10) Dogmatic	Inclined to lay down principles as undeniably true		
11) Solipsism	Quality of being self-centered or selfish	32) Subversive	Someone who undermines and challenges power, authority and order
12) Nihilism	Belief that life is meaningless	33) Prolifically	Producing a lot of something
13) Subvert	Undermine the power of authority	34) Innovative	Introducing new ideas, creative in thinking
14) Martyr	A person who is killed because of their religious or other beliefs	35) Radical	Innovative, not traditional
15) Pious	Deeply religious	36) Tyranny	Cruel government
16) Sacrilegious	Showing disrespect to something holy	37) Oligarchy	When a country is ruled by a small group of people. Government by the few
17) Fallible	Capable of making mistakes or being wrong	38) Usurp	To take illegally or by force
18) Admonish	To firmly reprimand, tell off	39) Scholar	A specialist in a particular branch of study, especially the humanities
19) Ramification	An unwelcome consequence of an action	40) Misogyny	Dislike of, or prejudice against women
20) Alluded	To refer to casually or indirectly	41) Erroneous	Wrong
21) Analogy	Comparison between one thing and another	42) Desecration	Damage or treat with disrespect
22) Impious	Showing a lack of respect for religion	43) Chastise	To rebuke or tell off seriously



Key vocabulary	
1. Crucible (n)	A severe test or trial; a test designed to bring about change or reveal an individual's true character.
2. Overture (n)	An introduction, opening, prelude, prologue.
3. Autocracy (n) Autocratic (adj)	A government in which one person has absolute power, dictatorship; despotism.
4. Paradox (n)	A statement that seem contradictory.
5. Deviant (n) Deviancy (n) Deviation (n)	Departure from a standard or norms.
6. Conjure (v)	To raise spirits from the dead.
7. Hypocrisy (n) Hypocrite (n) Hypocritical (adj)	A pretence of having a virtuous character, moral or religious beliefs or principles that one does not really possess.
8. Defamation (n) Defame (v)	The act of saying false things in order to make people have a bad opinion of someone or something.
9. Accusatory (adj) Accusation (n)	Containing an accusation.
10. Ideology (n) Ideological (adj)	The body of doctrine, myth, belief, that guides an individual..
11. Predilection (n)	A tendency to think favourably of something particular; partiality; preference.
12. Defile (v)	To make foul, dirty or unclean, taint, debase
13. Steadfast (adj)	Firm in purpose, resolution, faith, attachment.
14. Conviction (n)	A fixed or firm belief in something without need for proof ; unshakeable belief
15.Exaltation (n)	The elevation of a person, as to the status of a God.
16. Punitive (adj)	Serving for, concerned with or inflicting punishment.

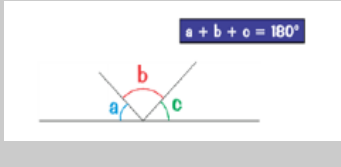
Key Terms	
17. Allegory	Figurative treatment of one subject under the guise of another.
18. Stage directions	An instruction written into the script of a play, indicating stage actions, movements of performers, or production requirements.
19. Subtext	The underlying and implicit meaning, as of a literary work.
20. Symbolism	The practice of representing things by symbols, or investing things with a symbolic meaning.
21. Dramatic irony	Situations of drama that is understood by the audience and not grasped by the characters in the play.
22. Motif	A recurring subject, theme, idea.
23. Denotation	Explicit or direct meaning of a word or expression.
24. Connotation	Something suggested or implied by a word or thing.
25. Hysteria	An uncontrollable outburst of emotion or fear, often characterized by irrational behavior.
26. Theocracy	A form of government in which God or a deity is recognized as the supreme civil ruler, the God's or deity's laws being interpreted by the ecclesiastical authorities.
27. Puritan	A person who is strict in moral and religious matters, often excessively so.
28. McCarthyism	The practice of making accusations of subversion or treason, without proper regard for evidence
29. Parochial	Very limited or narrow in scope or outlook; or provincial.



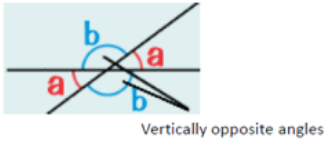
Term	Definition / Steps	Example
1 Equation	Expressions of equal value, connected by an =	$14 = a + 3$ $5 \times 6 = 30$
2 Solve	Find the value of an unknown in an equation	$4 + a = 13$ $\therefore a = 9$
3 Unknown	Variable with a fixed value; its value is found by solving	$15 = f - 12$ f is the unknown
4 Solving for the unknown	Finding the value of the unknown	
5 Simplify	Neaten or shorten an expression by collecting like terms	$4 + a - 1 = -15 - 3$ simplifies to $3 + a = -18$
6 Isolate	Cause the unknown to be on its own	
7 Eliminate	Remove, or get rid of, an operator	
8 Inverse	Opposite operation	The inverse of 3 is -3
9 Balance	Performing the same operation on both sides of an equation	$5 + a = 16$ $-5 \quad -5$
10 Steps to solve an equation	0. Simplify 1. Identify the unknown 2. Identify the operation to eliminate 3. Inverse and cancel 4. Balance the equation: inverse on both sides 5. New line	$4a = 11$ $\div 4 \quad \div 4$ $\therefore a = 11/4$
11 Operations to eliminate...	Are on the same side as the unknown	In $4 = a - 7$, eliminate -7
12 If the unknown if negative...	1. Isolate the unknown 2. Multiply both sides by -1	$3 - a = 11$ $-3 \quad -3$ $-a = 8$ $\times -1 \quad \times -1$ $a = -8$
13 If the unknown is in the denominator	Multiply both sides by the unknown first, then steps to solve	$\frac{3}{a} = 12$ $\times a \quad \times a$ $3 = 12a$ $-12 \quad -12$ $\frac{1}{4} = a$
14 If there is an unknown on both sides...	Eliminate the smallest unknown first	$5a = 4a + 8$ $-4a \quad -4a$ $a = 8$

Angle facts

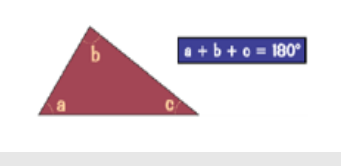
Adjacent angles on a straight line (at a point) sum to 180°



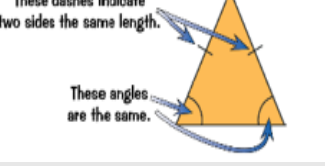
Vertically opposite angles are equal



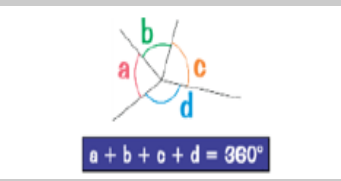
Internal angles in a triangle sum to 180°



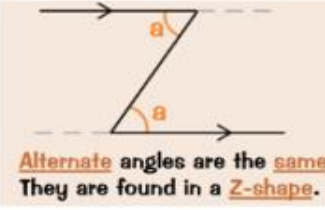
Base angles in an isosceles triangle are equal.



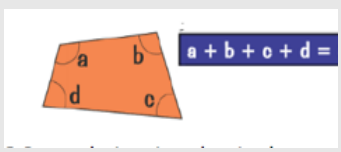
Angles making a whole turn around a point sum to 360°



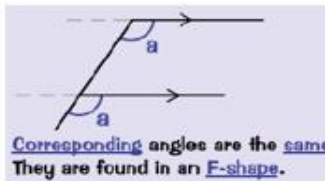
Alternate angles on parallel lines are equal



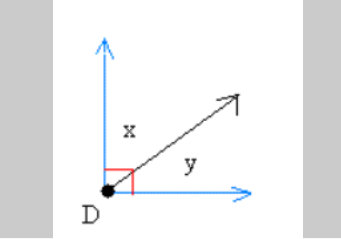
Internal angles in a quadrilateral sum to 360°



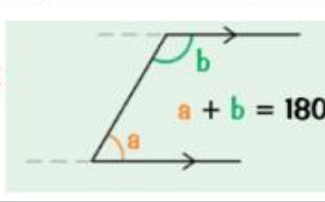
Corresponding angles on parallel lines are equal



Complement ary angles: Two angles which sum to 180°



Co-Interior angles sum to 180° (they are supplementary)





MathsWatch References

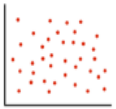
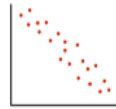
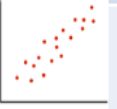
Inequalities	A20a,A20b, 138,139	Angles	G13,G17,G18,G19,G23,G31
Forming and solving equations	A12, A17, A19a,A19b	Constructions , Loci and bearings	G27, G26a, G26b,G26c



MW references	
Statistics	S4,5,6,7,8,9,10A,10B
Mean	A type of average where all the data is added and divided by the amount of data.
Median	An average found when all the data is put in order and the middle value is selected. (Remember to find the midpoint if 2 pieces of data are left)
Mode	An average which is the most popular piece of data. If there are two it is <u>bimodal</u> .
Range	The difference between largest value and the smallest value. (Remember it is <u>not</u> an average, it measures the <u>spread</u>)
Spread	Shows how <u>consistent</u> the data is. The bigger the spread the less consistent it is.

Key Terms	
Qualitative Data	Data which is non numeric. Eg: favourite subject, food...
Quantitative Data	Data which is numeric. Eg: heights, times...
Discrete data	Data that can only take certain values. Eg number of students in a class could be 29 or 30, not 29.5
Continuous Data	Data that can take any value to any degree. Eg a height could be 12.3m or 12.35m

Key Facts- Charts and Graphs	
Bar Charts	Used to compare discrete data. Ensure you use a clear scale. Bars should be separate and the same width. All parts should be labelled
Dual Bar Charts	The comparing data bars can touch and must be side by side, Eg girls and boys.
Line Graph 	Used to show a trend over time. It is plotted as a series of points, which are then joined with straight lines. The ends of the line graph do not have to join to the axes.
Pie Charts 	Used to represent groups of data. Divide 360 by the total frequency, this shows the degrees per person. Multiply each frequency by this number this gives the size of each sector. Make sure all the angles add to 360.
Scatter Graphs	Are used to look at links between two types of data, Eg height and weight. Plot each point like a coordinate

Key Concepts- Line of Best fit	
Line of best fit	This is a <u>straight</u> line drawn on a scatter graph, it should aim to go through as many points or have an equal number of points above and below it.
<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  No Correlation </div> <div style="text-align: center;">  Negative </div> <div style="text-align: center;">  Positive </div> </div>	
<p>The more inline the points are the <u>stronger</u> the correlation is.</p> <p>The line of best fit can be used to estimate.</p>	

Key Strategies- Averages from Frequency Tables	
Mean	If the data is grouped find the midpoint of each group first! Multiply each piece of data by the frequency. Then add each of these values up to find the total. Then divide this by the total frequency.
Mode/ Modal Class	Find the group with the highest frequency. The data is the mode/ modal class
Median	Find the total frequency, half it to find where the middle value is. The data in the table is in order. Count down through the frequencies until you find the middle persons values.
Range	Difference between the largest and lowest data values.

Key Tips	
Check that any average you calculate sits within the data.	
When finding the mean from a <u>grouped frequency table</u> it is an <u>estimate</u> as you do not know the exact data.	
When estimating from a line of best fit, draw how you estimate on your graph	
Ensure you use clear and scales in all drawings and include labels/ units	
When asked whether a hypothesis (a prediction) is true or false make sure you use an average to back up your answer.	
An <u>outlier</u> is a piece of data that does not sit within the rest of the data. These are easy to spot on a scatter diagram	

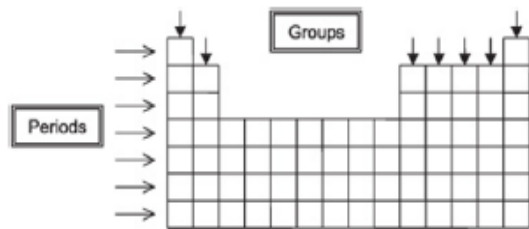
The Periodic Table

All the different elements are arranged on the Periodic Table. The elements are arranged in order of increasing atomic number. On the Periodic Table, the metal elements are on the left and non metal elements are on the right.

[illegible]

Groups and Periods

Elements are arranged on the periodic table in groups and periods. Horizontal rows are called periods and vertical columns are called groups.

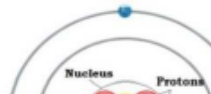


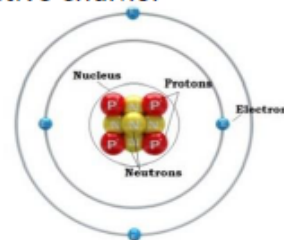
Group Number – tells us the number of electrons on the outer shell.
Period Number – tells us the number of shells an atom has.

Groups are labelled 1-7 from left to right, with last group being called either group 8 or 0. Elements in the same group have similar properties.

Key Terms	Definitions
Atom	What all matter is made up off
Atomic number	The number of protons in an atom
Mass Number	The total number of protons + neutrons in the nucleus

Structure of the Atom

- An atom is made up of three subatomic particles: protons, electrons and neutrons.
 - Protons are in the nucleus and have a positive charge.
 - Neutrons are in the nucleus and have no charge.
 - Electrons are in the shells and have a negative charge.
 - Protons and neutrons are the same size, where electrons have hardly any mass.
 - In an atom, there are equal numbers of protons and electrons because the positive and negative charges need to balance.
- 
- The diagram illustrates a simplified model of an atom. At the center is the nucleus, composed of red spheres labeled 'P' (protons) and yellow spheres labeled 'N' (neutrons). Surrounding the nucleus are two concentric circles representing electron shells. Blue dots on these circles represent electrons. Labels with arrows point to the 'Nucleus', 'Protons', and 'Neutrons'.



Atomic Number and Mass Number

This is the total of protons + neutrons

Mass Number → 23

23

Na

This is the number of protons

Atomic Number

11

1 Codivus

Electrons are not included in the mass number because they have hardly any mass.

To calculate the number of:

- Protons – look at the atomic number e.g. Na has 11 protons
- Electrons – must be equal to the number of protons e.g. Na has 11 electrons
- Neutrons – take away the atomic number from the mass number e.g. Na has 12 neutrons



Speed

The speed of an object is a compound measure, which shows the rate of change in distance with respect to a unit for time.

The standard unit for speed is m/s (metres per second).

Miles per hour and kilometres per hour are also commonly used.

Speed is calculated by **dividing distance by the time** (see equation in the box). The distance and time can be read from a distance-time graph.

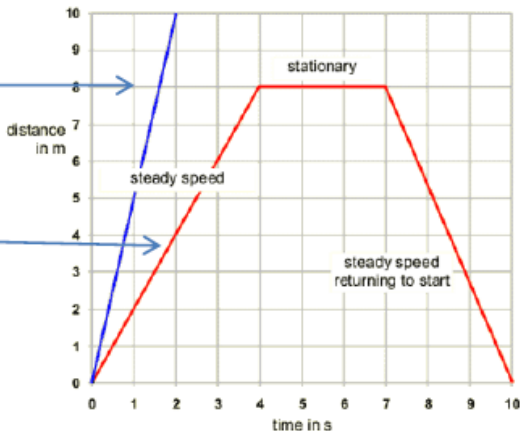
If the speed of an object is increasing, then it is **accelerating**. If the speed is decreasing it is **decelerating**.

Speed	Acceleration
$speed = \frac{distance}{time}$	$acceleration = \frac{change\ in\ speed}{time}$

Distance-Time Graphs

A distance time graph shows the time on the horizontal axis and the distance on the vertical axis.

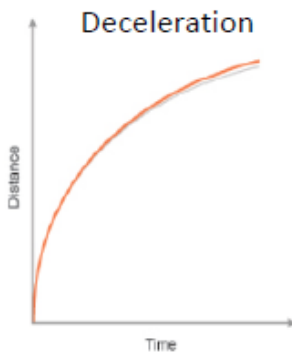
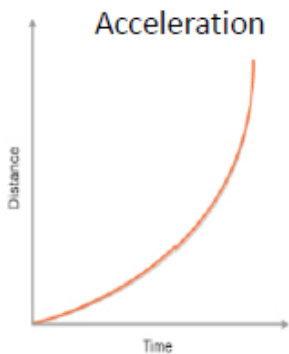
- If an object is stationary (not moving) the line **will be horizontal**.
- If the line has a diagonal slope the object is moving at a **constant** speed. The steepness (gradient) of the line shows the speed.
- If the line is going back towards the x axis it is **returning to its starting point**.



Key terms	Definitions
speed	The rate of change in distance with respect to time
gradient	How steep the line on a graph is; gradient represents the change in the y-variable with respect to the x-variable
stationary	Not moving
constant speed	A speed that is not changing, so the same distance is covered every second
axes	The horizontal and vertical lines used when plotting a graph
acceleration	The measure of how rapidly the speed of an object is changing
deceleration	The measure of how rapidly an object is slowing down

Acceleration and Deceleration

- When an object is accelerating, the line on a distance time graph will **curve upwards**, because the gradient gets steeper.
- When an object is slowing down the line will **curve towards the horizontal**, because the gradient gets less steep.





A force can be a **push or a pull**. You can not see forces, you can only see what the changes to objects that they cause.

When a force is applied to an object it can lead to:

- A **change in speed (acceleration)**
- A **change in the object's direction of movement**
- A **change in the object's shape (squash or stretch the object)**.

Forces can also be divided into 2 types, contact forces and non contact forces.

1. **Contact forces** act between objects that are touching. Examples: friction, normal contact force, thrust, upthrust, air resistance (drag). Friction acts whenever an object is moving through a fluid (a fluid is a liquid or gas), or when one solid surface is moving along another solid surface.
2. **Non-contact forces** act between objects even if they are NOT touching. Examples: gravity, weight, magnetic force.

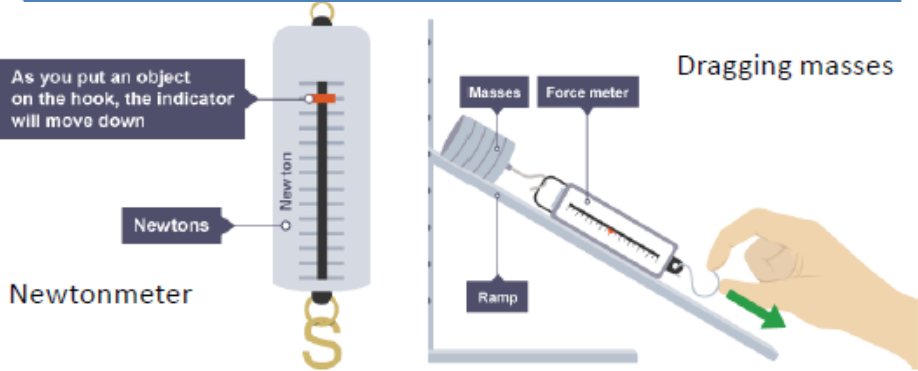
The unit of force is the **newton (N)**. This is named after Sir Isaac Newton, who developed a theory of gravity and showed how forces affect objects.

Measuring the size of forces

The laboratory equipment for measuring forces is also named after Sir Isaac Newton: the newtonmeter (see diagram).

To measure the size of frictional forces on different surfaces you can drag masses along the different surfaces and record how much force is required. For this experiment :

- Independent variable: Type of surface
- Dependent variable: Force
- Control variable: Mass



Key Term	Definitions
Force	An interaction between objects that causes changes to objects or how objects are moving
Newton	The unit of force
Newtonmeter	A piece of equipment that can be used to measure the size of the force
Contact force	A force acting between objects that are physically touching
Non-contact force	A force acting between objects that are not physically touching

Key Term	Definitions
Weight	The force pulling objects towards the centre of the Earth due to gravity
Gravity	The force between any two objects. We only notice gravity's pull if the objects are very large, like the Earth
Upthrust	The upward force produced by objects pushing down on fluids (liquids and gases).
Normal contact force	The push force produced on objects when they push on something solid. Also called 'reaction'.



Force Arrows

Forces have a **size** and a **direction**. This means we show forces with arrows.

- The length of the arrows shows how large the force is.
- The direction the arrow points shows the direction the force pushes or pulls.

Diagrams that show the forces acting on objects, using arrows, are called **free body force diagrams**.

Resultant force

The **resultant** force acting on an object is the single force *resulting* from all the separate forces acting on it. In other words, the resultant force is the single overall force.

To find resultant force:

- Add up forces acting in the same direction
- Subtract forces acting in opposite directions.

If the forces are equal in size and opposite in direction, the forces are **balanced** and the resultant force is 0 N. In all the free body force diagrams to the right, the forces are balanced. If the forces are not equal in size, they are **unbalanced** and the resultant force is NOT 0 N.

Resultant forces cause the **changes** to objects described on the last page.

We will focus on changes to speed:

1. If the resultant force on an object is 0 N, the object's speed does not change. This means it is stationary (still) OR keeps going at a constant speed.
2. If there is a resultant force on an object, its speed will change. It will **accelerate** or **decelerate**.
3. Knowing the resultant force does not tell you which way an object is moving. It just tells you that the speed will change.
4. A LARGER resultant force is needed to accelerate an object at a higher acceleration. Also, a larger resultant force is needed to accelerate heavier objects.

Newton's second law

Point 4. above is shown in Newton's second law: this equation –

$$F_R = m \times a$$

Where F_R is the **resultant force** measured in newtons,
 m is the **mass** of the object measured in kilograms,
 a is the **acceleration** of the object measured in metres per second per second (m/s/s).

Forces and Energy

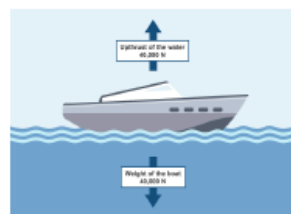
When forces are acting on an object, it causes a transfer in the store of energy.

Example to know: when a push force is applied to a moving object, the energy changes store from kinetic energy to thermal energy. This is because the push force is working against friction, and friction causes objects to warm up.

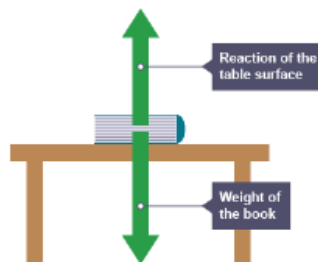
Free Body Force Diagrams

Learn the forces and their directions for each force on these free body force diagrams:

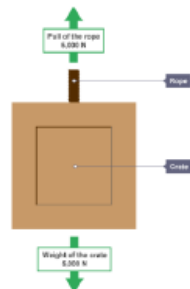
A boat floating



A book on a desk



A crate held up by a rope



Pollination

Pollination is the transfer of pollen from the anthers of one flower to the stigma of another flower (of the same species).

- In **wind pollination**, the wind carries the pollen from the anthers of one flower to the stigma of another.
- In **insect pollination**, insects carry pollen from anthers to stigmas. Insects (e.g. bees) go to flowers to get nectar for food; the pollen sticks to them, and is carried on to the next flower.

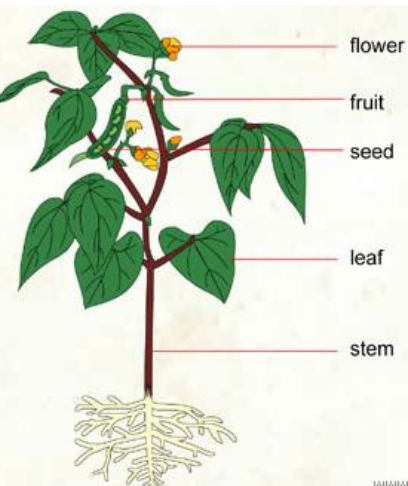
Flowers of insect-pollinated plants tend to be adapted to attract pollinating insects, sometimes having stripes to guide the insects toward the nectar and pollen.

Plant Structures

There are three main plant tissues:

1. Dermal tissue – outer covering of the plant.
2. Vascular tissue – used for transport in the plant.
3. Ground tissue – for photosynthesis, storage and support.

These tissues work together in the organs (roots, stems, leaves and flowers) and the organs work together in two organ systems:

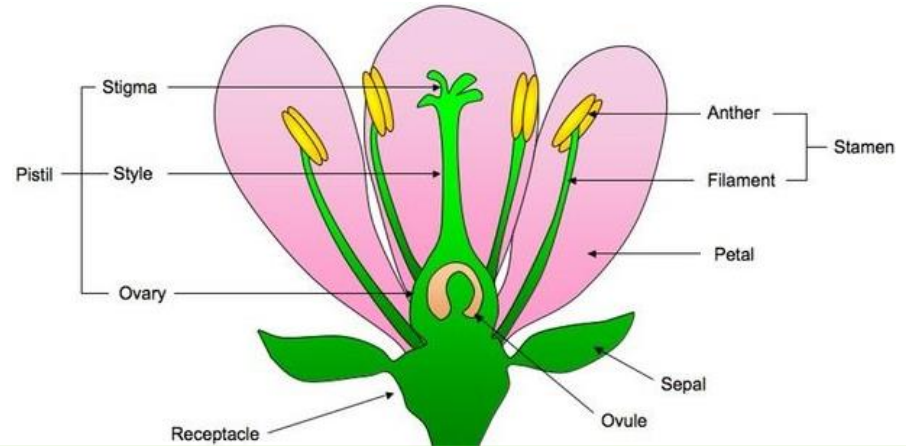


Shoot system

Stem, leaves, fruit ,flowers (if present)

Root system

One or more separate roots



Plant Reproductive System

Anthers produce pollen, the male gametes. They are joined to the flower by a filament.

Female gametes, ovules, are produced and stored in the ovary. Above this is a stalk-like structure called a style that ends in a sticky surface called the stigma. The stigma will accept incoming pollen to allow fertilisation.

Fertilisation

After pollination, the pollen makes a pollen tube down the style to the ovary. The nucleus of the pollen cell travels down the tube to get to the ovum (egg cell) – when the cells join, this is fertilisation.

The cell made when the pollen and ovum fuse will become a seed, which can become a new plant. Plants then form fruits, often from the ovary walls.

Seed Dispersal

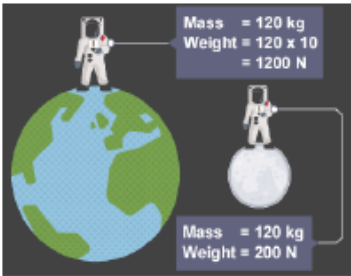
Plants spread their seeds out – this is called dispersal – so that the offspring don't compete with them for light or soil nutrients. Dispersal can be via:

- Animals – eating the fruit and releasing seeds in waste (e.g. mistletoe).
- Wind – carrying seeds away (e.g. sycamore or dandelion).
- Water – tides or currents carrying away fruit (e.g. coconuts).

Mass and Weight

Mass measures how much material there is (in kg), whereas weight measures the **force** acting on an object due to a **gravitational field**. Therefore the mass of an object **never changes**.

The weight of an object depends on **the gravitational force** that is acting on it and can therefore change. The diagram below shows the difference between mass and weight, not how the astronaut's mass remains constant but their weight is much lower on the Moon.



Gravitational forces

There is a gravitational force of attraction between all objects. However this force only becomes important when the objects are very large. For example planets, stars and moons.

The size of the gravitational force between objects depend on two things:

- 1. **How large the objects are**
- 2. **How far away the objects are from each other**

For example all the planets are attracted to the Sun by a force of gravitational attraction, this keeps them in orbit and prevents them from flying off into space.

The Moon is also kept in orbit with the Earth due to gravitational attraction. As the Earth is much smaller than the Sun it can only keep the Moon in orbit as it is very close to the Earth.

Key Terms	Definitions
Mass	Mass measures the amount of material in an object, and is measured in kilograms (kg).
Weight	Weight is a force , caused by gravity acting on a mass. Since it is a force, it is measured in Newtons.
Gravitational Field Strength	The measure of how strong the gravitational field of a large object is. For instance, the gravitational field strength on Earth is about 10 N/kg. This means that a weight of 10 N acts on each kg of mass on Earth.

Weight on different planets

All planets have a gravitational field strength. This is a measure of how much force another object will experience. Weight is a force produced by a gravitational field acting on an object with mass and is calculated using the formula:

$$Weight\ (N) = mass\ (kg) \times gravity\ (N/kg)$$

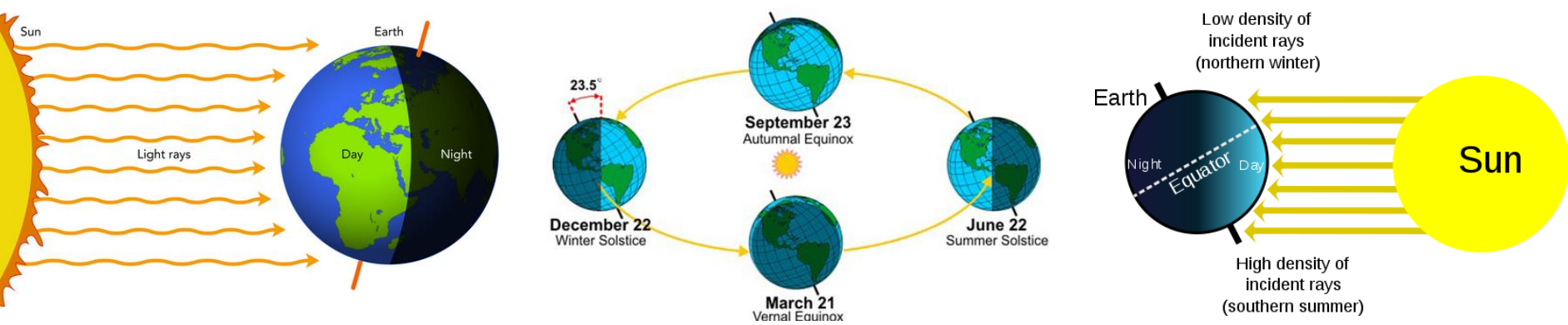
Below is an example of how much a 50kg mass would weigh in different parts of the solar system. When an object is in space we say it is weightless as the force of gravity felt by the object is very small.

Planet	Weight of 50kg mass
Mercury	180N
Venus	440N
Earth	500N
Jupiter	1245N
Pluto	14.5N

The seasons

The Earth’s axis (the imaginary line between the North and South poles) is tilted slightly. The angle of the tilt is approximately 23°: this means that different parts of the Earth are tilted toward or away from the sun at different times of year.

- When the northern hemisphere is tilted toward he sun, we get summer in the UK (longer days and warmer temperatures). It will be winter in the southern hemisphere.
- When the northern hemisphere is tilted away from the sun, we get winter in the UK (shorter days and colder temperatures). It will be summer in the southern hemisphere.
- During the summer, the Sun appears higher in the sky and the day is longer. During the winter, the Sun appears lower in the sky and the day is shorter.



Day and Night and Years

The Earth takes 365 ¼ days to orbit the Sun, we call this **a year**. The length of a year is different on other planets. If the planet is further from the Sun the length of a year is longer, for example Jupiter takes 12 Earth years to orbit the Sun. This is because Jupiter has to travel much further in its orbit.

The Earth is constantly rotating on its axis (the imaginary line between the North and South pole). It rotates once every 24 hours, we call this **a day**. During this time, half of the Earth will be facing the Sun, this half of the Earth will be in daylight, the side not facing the Earth will be in night.

Key Terms	Definitions
Axis	The imaginary line in the Earth between North and South pole
Day	The time taken for a planet to rotate once on its axis. On Earth this is 24 hours.
Year	The time taken for a planet to completely orbit the Sun. It takes Earth 365.25 days.



Our solar system

Our solar system consists of:

- One star: the Sun (the Sun is about 100 times larger than Earth);
- Eight planets, which orbit the Sun;
- Dwarf planets, such as Pluto, which also orbit the Sun;
- Natural satellites: the moons that orbit some of the planets;
- Other objects like asteroids and comets.

Our solar system is a very small part of the Milky Way galaxy. Galaxies consist of millions of stars, held together by their gravitational attraction to one another.

The order of the objects in terms of size is:

asteroid → moon → planet → star → solar system → galaxy



Key Terms	Definitions
Star	A huge (compared to Earth) sphere of superhot gas (plasma).
Planet	A spherical object much smaller than a star, made of rocky or gaseous material , which orbits a star.
Dwarf planet	Small planets that have not cleared their orbit of other material. Like planets, they orbit a star.
Galaxy	A huge number of stars held together by their gravitational attraction to one another. Our galaxy is called the Milky Way.
Astronomical Unit	Distance between the Earth and the Sun
The Universe	Is all of space and time
Light year	The distance travelled by light in one year.

Light Years

The distances between objects in the Universe are so large that we do not use units like kilometres: instead, we use the **light year**.

A light year is a measure of distance equal to the distance light travels in one year (9400000000000km).

The distance between the Sun and our nearest other star Alpha Centauri is 4.22 light years.

The distance between the Milky Way and our nearest other galaxy Andromeda is 2.5 million light years.

In our solar system, the **astronomical unit (AU)** is often used as a unit of measurement. 1AU is the distance from the Earth to the Sun, or 149597870km. The distance between Mars and the Sun is approximately 1.52 AU.

Theories on the formation of the Solar System

Human’s understanding of the Solar System has developed. The Greek astronomer Ptolemy proposed the **geocentric model**, which placed the Earth at the centre of the Solar System, with other stars and planets orbiting the Earth, while the Earth remained stationary.

In the 17th century Galileo invented the refracting telescope, with this he observed Jupiter and observed that Jupiter had Moons. This showed that not everything orbited the Earth. This led to the development of the **heliocentric model** of the Solar System, this time the Sun was stationary and at the centre, whilst the planets orbited the Sun. This was proposed by the scientist Copernicus

The heliocentric model was an improvement but using modern telescopes we now know much more about the Universe and have discovered that our Solar System is also rotating as part of the Milky Way Galaxy.



Populations of a Species Change over Time

Populations change by **natural selection**, like this:

1. In a population of a **species**, the individuals vary: they have different **adaptations**.
2. All individuals are constantly in **competition** with each other to survive.
3. The individuals with adaptations that help them compete in their environment do survive. The individuals with adaptations that don't help them compete die.
4. The surviving individuals have the chance to **reproduce**.
5. When they have offspring, they pass on the useful adaptations in their genes.

When the environment changes, the adaptations that help survival might be different. This can cause adaptations that once helped survival to become less useful, so individuals with them can die. These changes could be:

- climate change;
- natural disaster like an asteroid striking Earth;
- new diseases in the environment;
- a new predator in the environment;
- new competing species in the environment.

If a large change to conditions in the environment happens, it could be that NO individuals have suitable adaptations for survival. In this case, all the individuals can die: this is called **extinction**.

Maintaining Biodiversity

High **biodiversity** is very important for keeping **ecosystems** going. An ecosystem with only one species won't last long. For humans, maintaining (keeping) biodiversity is important for a number of reasons:

1. All life in ecosystems and across the Earth is connected. Extinction of one species can cause the ecosystem to become unbalanced.
2. Humans use plants as a resource for new medicines.
3. Humans have rather a lot of control over nature, so we are responsible for looking after it.
4. Nature is beautiful and great to experience – we should look after it for future generations of people.

Two ways to maintain biodiversity:

1. Conserve the environment to protect ecosystems.
2. Conserve the genetic material of organisms that might be endangered using a **gene bank**.

Key Terms	Definitions
Species	One type of living organism
Population	All the individuals of a species in an area
Individual	One of a species (e.g. one lion, one beech tree)
Adaptation	A feature of an organism that allows it to survive in its environment. Adaptations are the result of natural selection.
Competition	The battle for survival in nature: individuals in a population compete for the limited resources (e.g. food) available.
Natural selection	The natural process in which useful adaptations keep individuals alive to reproduce, and adaptations that don't help survival are filtered out. This is how evolution happens.
Extinction	The complete destruction of all individuals of a species
Endangered	Describes species at risk of becoming extinct
Reproduction	Making offspring (babies).
Ecosystem	A group of populations of different species and their environment, linked by feeding relationships
Biodiversity	A measure of how many different species of organism live on Earth, or in a certain ecosystem. High biodiversity means there are many different species present.
Conserve	Keep an environment as it is.
Gene bank	A store of genetic material in case the organisms die out.

Gene Banks

Scientists worried that species might become extinct can preserve them for the future using a gene bank. There are different types of gene bank:

1. Frozen seeds of plants that could be used in the future
2. Plant tissue bank – where small parts of plants are kept alive in containers of nutrients
3. Frozen sperm cells and egg cells from animals, or pollen and ova from plants, that can be used to produce offspring in the future
4. A field gene bank: land is used to grow many species of plants and keep them alive for the future.



No.	Key Term	Definition
1	Ice Age	A time when Earth’s average temperature was lower than usual and glaciers spread.
2	Tundra	A cold region where the ground is deeply frozen; only the surface thaws in the summer
3	Pleistocene	The Pleistocene Epoch is typically defined as the time period that began about 2.6 million years ago and lasted until about 11,700 years ago. The most recent Ice Age occurred then, as glaciers covered huge parts of the planet Earth
4	Holocene	From about the last 12 000 years till now- end of the last major ice age until now.
5	Glacier	A river of ice
6	Glacial	To do with glaciers
7	Glaciated	Covered by glaciers, now or in the past
8	Geology	Types of rocks
9	Erode	The breaking down of material
10	Transport	The movement of material
11	Deposit	The dropping of material
12	Ice Shelf	A sheet of ice that is attached to land, but floats on the ocean
13	Icebergs	Chunk of ice that has broken off an ice shelf.

Glacial erosion and transportation processes		
14	Abrasion	The plucked rocks scrape bits off the glacial bed.
15	Plucks	The ice freezes around the stones and pulls it out.
16	Freeze-Thaw weathering	Water under the glacier freezes in cracks in the rocks. As it freezes it expands and so the crack gets bigger/ It thaws, fills with more water and freezes again and so on.
17	Crevasses	Deep scars in the landscape created by glaciers
18	Striations	Deep scratches in the rock as a result of abrasion caused by glaciers
19	Glacial Till	Rocks, stones, clay and sands deposited by glaciers
20	Meltwater	Water from melting glacial ice
21	Snout	The end of the glacier.
22	Glacial landform	Landforms created by glaciers
Glacial Landforms		
23	U Shaped Valley	Abrasion and plucking widens the valley creating a U shape.
24	Misfit river	A river that doesn’t fit the size of the valley
25	Ribbon Lake	Long thin lakes caused by a glacier scraping the valley floor.
26	Hanging Valley	A small valley that hangs above a larger one.
27	Moraines	Where a glacier melts it deposits its load of rocks, sands, clays and stones= everything falls as till. This deposited till is called a moraine.



No.	Key Term	Definition
1	A superpower	A country that has some or all of the following qualities 1) A large landmass 2) A large population 3) A strong military 4) lots of political influence 5) A high GDP 6) Cultural dominance
2	A plain	A landmass that is flat or has gentle rolling hills- over many kilometres
3	Peninsula	Surrounded by water on three sides
4	A continental climate	Characterised by two main seasons; long, dark cold winters with brief warm summers
5	Taiga Biome	A biome characterized by coniferous forests, consisting mostly of pines, spruces and larches. The taiga is the world's largest biome (apart from oceans)
6	Tundra Biome	Comes from the Finnish word "tunturia" meaning "treeless plain". It is the coldest of all the biomes and is too cold for trees to grow.
7	Permafrost	Permanently frozen soils
8	Choropleth Map	A map that uses different colours to show variations in data.
9	Densely populated	Crowded places
10	Sparsely populated	Few people living there.
11	Population density	Total population / area= population density shown as people per km ²
12	GIS	Geographical Information System
13	EEZ	Exclusive Economic Zone

Russia key facts		
14	Size	Biggest country in the world; occupies one-tenth of all the land on Earth
15	Size compared to the UK	70 times the size of the UK
16	Continent	Mostly in Asia but partly in Europe
17	Lake Baikal	Is the world's deepest and oldest lake, holds 20% of the world's unfrozen water
18	Forests	Accounts for 20% of the world's forests
19	Mountains	The Ural mountains separate Asia and Europe
20	Record low temperature	-71°C recorded in Siberia in 1974
21	Number of neighbouring countries	14
22	Natural Gas	Produces 20% of the world's natural gas.
23	Population	142 million (only twice that of the UK).
Energy Key terms		
24	Non-renewables	These are being used up and cannot be replaced- coal, oil and gas.
25	Renewables	These will never run out and can be used over and over again i.e. solar and wind power.
26	Recyclable	They provide energy from sources that can be recycled or reused i.e. biofuels.
27	Peak Oil	The theoretical point at which half of the known reserves of oil in the world have been used.
28	Shale Gas	Natural gas trapped in shale rock.



Key Words		
1	Civil War	A war between different groups within the same country
2	Divine Right of Kings	A belief that the Monarch was chosen by God, that their power and authority was derived from God and they had to answer to no one except God
3	Puritans	Strict Puritans who thought the Church of England had not gone far enough in removing popish elements; they wanted a purified Church
4	Laudian reforms	Changes made by William Laud, Archbishop of Canterbury, introducing more ceremony, decorations and music; to Puritans it looked popish (Roman Catholic)
5	Ship money	A tax traditionally only imposed on coastal towns in times of war, to pay for the navy; Charles imposed the tax during peace and across the country
6	Court of Star Chamber	A special, medieval, law court which sat in secret and needed no evidence or witnesses; Charles used it to prosecute opponents
7	Impeach	To put a member of the government on trial for crimes; the trial is heard by Parliament
8	Cavaliers	The insulting nickname given to the Royalists, who fought for the King; it literally meant "horsemen" but also suggested arrogance and conceit
9	Roundheads	The insulting nickname given to those who fought for Parliament; many Puritans wore their hair very short / closely cropped
10	New Model Army	Fulltime, highly disciplined, professional army set up by Thomas Fairfax and Oliver Cromwell; Puritan in makeup; vital in defeating Charles
11	Regicide	Literally "kingkillers";

The Gunpowder Plot 1605	
12	Who: A group of Catholics including Guy Fawkes, Robert Catesby, Thomas Winter, Thomas Percy, and John Wright.
13	What: Plotted to kill the King of England (James I) by blowing Parliament up
14	Where: A cellar under the House of Lords, Parliament, Westminster, London
15	When: 5th November 1605. This was State Opening day, when the King, Lords and Commons would all be present in the Lords Chamber to open parliament.
16	Why: Guy Fawkes was one of a small group of Catholics who felt that the government was treating Roman Catholics unfairly. They hoped that King James would change the laws, but he didn't. Catholics had to practise their religion in secret. There were even fines for people who didn't attend the Protestant church on Sunday or on holy days. James passed more laws against the Catholics when he became king. These Catholics wanted to get rid of Protestant ideas.

17 Charles' Problems		
Money	Religion	Power
-Charles had a lavish lifestyle and was running out of money, he was bankrupt. -Raising taxes without consulting Parliament -Ship Tax collect	-Charles married a Catholic in 1625, Henrietta Maria of France. Charles forced the Scottish Church to look more Catholic. -He introduced a new prayer book in 1637. Charles allied Protestant England with Catholic Spain.	-Charles believed in Divine Right, he did not want Parliament telling him what to do. -In 1640 Charles lost a war against the Scottish which made him look weak. -In 1642 Charles took control of the army without Parliament's permission

Key People		
18	James I	King of England and Scotland from 1603-1625
19	Charles 1	Ruled from 1625-1649
20	Henrietta Maria	Daughter of Henri IV of France; Catholic
21	William Laud	Archbishop of Canterbury; Protestant; initiated reforms in the Church which were hated by Puritans
22	Thomas Fairfax	Parliamentarian General and creator of the New Model Army
23	Oliver Cromwell	Ruled England as Lord Protector from 1653-1658
24	Richard Cromwell	Ruled England as Lord Protector from 1658-1659
25	Charles II	Charles I's son. Ruled from 1660-1685

Key events	
1642	22nd August: Charles raises the royal standard at Nottingham Castle, starting the civil war. 23rd October: Battle of Edgehill – a draw between Charles and Parliament
1644	2nd July: Battle of Marston Moor – Charles defeated by Parliament
1645	February: New Model Army created by Thomas Fairfax and Oliver Cromwell 14th June: Battle of Naseby. Charles devastatingly defeated by Parliament
1646	End of the First Civil War, when Charles surrendered to the Scots who handed him over to Parliament, in return for money
1648	Second Civil War, when Charles persuaded the Scots to invade England on his behalf; rebellions in support of Charles in Wales and Kent 19th August: Battle of Preston- Decisive victory for Parliament
1649	Trial of Charles on charges of being a "tyrant, traitor, murderer and public enemy"; execution of Charles I "I go from a corruptible to an incorruptible Crown"
1649	Charles I executed in London. Commonwealth of England (England becomes a Republic) under Oliver Cromwell and Parliament.
1650	Cromwell appointed as Lord General, effectively commander in chief, of the parliamentary armed forces
1653	Cromwell became Lord Protector – ruling over England like a King.
1658	3rd September – Oliver Cromwell dies. He is succeeded by his son Richard Cromwell as Lord Protector



1	Empire	A group of countries, people or land controlled and ruled by one single powerful country.
2	New world	A name given to the Americas during colonization by Europeans in the 16 th century.
3	Governor	Most British colonies had a Governor who would be responsible for ruling on behalf of the monarchy.
4	Privateer	A naval captain who has permission from their government to attack and rob the ships of another country.
5	Tariff	Tax paid on goods that are imported.
6	Mughal Empire	The Empire that ruled India in the 1500's which, at its height, ruled four million square kilometers.
7	Colony	A country that is part of an Empire.
8	Penal Colony	An area of land or country used to house prisoners
9	Native	A person that has been in a country or region from earliest times.
10	Commonwealth	A group of nations with a shared loyalty or government
11	East India Company	a powerful English company that had trading rights throughout India.
12	Nawab	An Indian prince or ruler
13	Puppet ruler	An official ruler who has little political power because they are controlled by someone else.
14	Garrison	A base for soldiers
15	Governor-General	The chief representative of Britain in its colonies.
16	Mutiny	A revolt by members of the military
17	Missionary	A person sent on a religious mission, often to convert people to Christianity.
18	Cash crop	Crop grown and sold for profit rather than grown for the local people.

The British Empire	
19	-At its largest, covered 13 million miles or 22% of the world! -It controlled over 450 million people or 1/5 of the world's population. -Began in the 16th Century, with British forces establishing trading posts overseas and grew all the way through to the 20th Century.
Colonies of the British Empire	
20	Australia - Australia was used as a <u>location for criminals</u> . Criminals would be shipped to Australia, where they would be used as a workforce. It also gave people an opportunity to <u>escape poverty and gain wealth</u> in Australia. It was also an important naval base, helping Britain control the seas.
21	The Caribbean – Because of the warm climate, the Caribbean <u>grew important crops</u> that Britain could not. Therefore sugar, cocoa and coffee were all grown in the Caribbean and taken to Britain. In the middle of the 1800's however, bad weather and the growth of sugar in America, led to less money being made from the area.
22	Africa – Britain used the people of Africa <u>as slaves</u> and made a lot of money selling them at auctions. <u>The Gold Coast was important</u> because it held lots of gold, ivory and silver, which were traded for fortunes.
23	India – India was an important producer of spices and of materials that were traded across the Empire.
How did the British Control its Empire?	
24	Military Force – Britain's weaponry developed throughout this period, inventing weapons such as the Maxim gun – one of the <u>first machine guns invented</u> . They also stopped guns coming into the hands of those in the Empire. The Africans had poor quality weaponry, they made their own bullets which broke their guns.
25	Use of Locals – The British went on a <u>charm offensive</u> , making the local rich people feel wanted and gave them more money and power. Local people ran the police, law courts and prisons, making them feel in charge of their country and less likely to break laws.
26	Communication – The British <u>could easily communicate</u> between the countries of their empire using methods such as telegraphs, radios and ships.
27	Gradual Change – The British didn't try to change everything at once, <u>they gradually changed</u> and developed areas of countries.
28	Dealing with Resistance – The British were <u>efficient in stopping</u> anyone who opposed the Empire. Protestors were immediately jailed and local armies broken up .
Fall of the Empire	
29	Actions by people in the colonies – There were demonstrations against British rule in the 1920's for failing to honour promises <u>to Egypt and Iraq</u> . Britain <u>allowed Ireland partition</u> (splitting into Northern Ireland and Ireland), it sent out a message to others in the Empire that they could leave. In 1948 there was violence in <u>Palestine</u> aimed at the British. There were <u>strikes in India</u> , Egypt and Kenya against British Rule.
30	Actions by people in Britain – In the 1960's people in Britain were <u>more interested in freedom</u> , rather than using force to keep people under control.
31	World Events – In 1931, Canada, Australia and New Zealand formed a new Commonwealth. The domination of the USA and Russia after WW2 showed that you didn't need to have an empire to be a world leader.
32	Trade and Economics - India became less important to the British Empire. The cost of keeping a large number of soldiers to defend the empire was too much
Wars of the Empire	
33	India - Britain started to occupy India in the 18th Century. As Britain gained control over India there were revolts against the British rule. At the <u>Battle of Plassey in 1757</u> , 3000 British soldiers defeated a 40,000 strong Indian and French Army.
34	Australia – Britain claimed Australia in 1770, the aborigines who already lived there were not happy about their land being taken. The <u>British killed huge numbers</u> . The same thing happened in New Zealand, where the <u>Maori people</u> were reduced from 100,000 to 35,000.
35	South Africa : In 1879 Britain wanted to control more of Africa and started a war against Zululand. Britain sent 16,000 soldiers and an easy victory was expected against <u>the Zulus</u> who were armed with shields and spears, however, British soldiers were defeated by 20,000 Zulu warriors.



Vocabulary

polytheism	Belief in many gods.
Sanskrit	A language used in ancient India which many Hindu texts including the Vedas are written in.
Vedas	A collection of sacred writings. It literally means 'knowledge'.
Vedic people	The people written about in the Vedas who worshipped many gods in charge of the natural world and sacrificed animals. Some of their gods are still worshipped by modern Hindus.
deities	Gods or goddesses. Some Hindus are monotheists who believe in one supreme deity, others are polytheists.
Vaishnavas	Hindus who believe that Vishnu is the supreme God.
Shaivas	Hindus who believe that Shiva is the supreme God.
avatar	A god who descends to earth as a human or animal in order to fight evil and re-establish goodness. Vishnu has ten avatars.
Aum	The symbol of Hinduism and a sacred sounds that Hindus chant.
vibhuti	The three white lines on Shiva's forehead, which represent his superhuman powers. Shaivas sometimes paint these lines on their own foreheads.
Mahabharata and Ramayana	The names of the two epic stories, which are inspirational for Hindus.
Purana	A Hindu text that is more recent than the Vedas, but is still thought to contain profound wisdom and teachings.
bhakti	A Sanskrit word meaning 'devotion' or 'worship'; some Hindus believe that bhakti alone can be a way to achieve moksha.
karma	The forces that influence people's fortune and future reincarnations.
moksha	Escaping from samsara and never dying or becoming reincarnated again; the word literally means 'release'.
reincarnation	When a soul is reborn by passing into a new body.
samsara	The continual process of death and reincarnation; also the entire universe as we know it.
dharma	The moral law that Hindus must follow; the word can be translated as 'duty' or 'righteousness'.
Upanayana	A traditional Hindu ceremony that children undergo when they are ready to be educated about the Vedas and other sacred texts. It is where many Hindu boys 'take the sacred thread' which is a thin cord worn for life.
ascetic/sadhu	Someone who lives a simple life away from society, usually to become closer to the supreme being or to achieve moksha.
tapas	It literally means 'heat' and is something that ascetics and people practising yoga intensively generate.
yoga	Controlling the mind and body to purify yourself and achieve moksha. It is a Sanskrit word meaning 'yoke, a harness that is placed on an animal to control it. Through yoga Hindus try to 'yoke their mind and body. Yoga involves three things, postures, breath control and meditation.
puja	The Sanskrit word for worship.
mantra	An extract from a sacred text that is chanted repeatedly during worship.
murti	An image of a god or goddess.
darshan	'Seeing' God; a form of worship and devotion in which the murti of a deity is revealed to worshippers.
mandir	A Hindu term for a temple.
tirtha	A 'crossing place' where a deity enters the human world; for this reason, they are places for pilgrimage. An example is Varanasi where Ganga came to earth forming the river Ganges.
Diwali	The festival of lights, celebrated by nearly all Hindus who light lamps and candles. It has many different meanings to different Hindus e.g. to welcome Lakshmi into their homes or remember the story of Rama and Sita or Nachiketas.
Caste System	A series of social classes that determine someone's job and status in society. It includes brahmins (priests), Kshatriyas (warriors), vaishyas (traders and farmers), shudras (manual labourers/servants).
Untouchables/Dalits	People who are considered to be lower in status than the lowest caste. Dalits means 'oppressed' or 'broken'. Ghandi called dalits 'harijans' meaning 'children of God'.
ahimsa	Literally 'non harming' or 'non violence'; a Hindu teaching that encourages peaceful resolution of conflict and kindness towards other living creatures.
pantheism	The belief that God is in everything.
sati	When a woman throws herself on to her husband's funeral pyre.



Vocabulary	
Guru	A religious teacher or guide who leads a follower from spiritual ignorance ('gu', 'darkness') into spiritual enlightenment ('ru', 'light') There are 10 human gurus in Sikhism.
Sikh	A follower of Sikhism. Sikhism began approximately 500 years ago. There are 25 million Sikhs in the world. 19 million live in India and over 700,000 live in the UK making it the country with the second highest Sikh population in the world.
Janam Sakhis	Stories about the childhood and life of Guru Nanak e.g. the cows and snake.
Mughal Empire	The rulers of the area that is now India and Pakistan in the sixteenth and seventeenth centuries.
Revelation	A message revealed by God to humans.
Bhai	A title given to people respected by Sikhs; it literally means 'brother'.
Chapati	A type of flatbread commonly eaten in India and Pakistan.
Kartapur	A town in modern Pakistan where the first Sikh community was founded in 1522 by Guru Nanak.
Adi Granth	A collection of hymns and writings of the early Sikh Gurus compiled by Guru Arjan; it means 'first book'.
Guru Granth Sahib	The Sikh holy book; the name means 'from the Guru's mouth'.
khanda	The symbol of Sikhism, made up of two double-edged swords, one sword in the middle and a circle.
Amrit	Sugar that is mixed into water using a sword; it is drunk at the Amrit ceremony where people become part of the Sikh Khalsa.
Initiated	Made a member of a particular group through a special ceremony.
Khalsa	The community of Sikhs founded by the tenth Guru, Gobind Singh.
Panj Pyare	'The blessed ones' – the first five men who volunteered to join the Khalsa
The Five Ks	Five articles of faith worn by the Khalsa: kesh (uncut hair), kangha (a wooden comb), kara (a steel bracelet), kachera (special cotton underwear) and kirpan (a short sword).
Singh	'Lion' – the title given to a male Khalsa Sikh.
Kaur	'Princess' – the title given to a female Khalsa Sikh.
granthi	People who read from, and look after, the Guru Granth Sahib; Sikhs do not have religious leaders and anyone can read from the Guru Granth Sahib.



Essentials of Christianity

- † 2000 years old, began in the Middle East
- † Founded by **Jesus Christ**.
- † Christians believe that there is only one God, but God is also a **Trinity**
- † Christians believe that Jesus was the **Messiah** promised in the Old Testament.
- † Christians believe that Jesus Christ is the Son of God.
- † Christians believe that God sent his Son to earth to save humanity from the consequences of its sins.
- † One of the most important ideas in Christianity is that of Jesus giving his life on the Cross (the **Crucifixion**) and rising from the dead on the third day (the **Resurrection**).
- † Christians worship in buildings known as **church**, but strictly speaking the church is the people who follow Jesus, not a building.
- † The Christian holy book is the **Bible** which is made up of two main sections: the Old Testament and the New Testament.
- † Christianity is the biggest religion in the world with about 2.1 billion followers. It is a global religion so includes people from all types of ethnic, cultural and language backgrounds.
- † There are many different groups within Christianity. The three main groups are **Roman Catholic, Orthodox** and **Protestant**.
- † Christian holy days such as **Easter** and **Christmas** are important milestones in the Western secular calendar

Christian beliefs concerning God

- There is only one God, but Christians believe that God has revealed Himself in three persons: God the Father, God the Son, and God the Holy Spirit. This belief is known as the Trinity.
- God is eternal (beyond time): God has always existed, and God will always exist.
- God created the universe without help.
- God is omnipresent (God is everywhere, all the time), God is omnipotent (God can do anything at all), God is omniscient (God knows everything).
- God is just, but God is also merciful. God punishes the bad and rewards the good.
- God is forgiving towards those who mess things up. All people have sinned, but God has made a way through Jesus for everyone to be restored to a right relationship with God, have eternal life and go to heaven.
- God the Father: the creator, source of life and ultimate authority in the universe.
- God the Son: God who lived on earth as Jesus, both fully God and fully human.
- God the Holy Spirit: God who is active in the world today—continues to guide, comfort and encourage Christians in their journey through life.

Jesus: the incarnation

Christians believe that the birth of Jesus in Bethlehem just over 2,000 years ago was the entrance of God into His world as a human being. He was born into a Jewish family (Mary and Joseph) because Old Testament prophets had foretold that the Messiah would be born to a descendant of King David, the King of Israel.

At his birth, He was given the name 'Jesus' which means 'God saves'. This was to show why He came down to earth.

Important Biblical Quotes

- "I and the Father are one." - John 10:30
- "And when Jesus was baptized, immediately he went up from the water, and behold, the heavens were opened to him, and he saw the Spirit of God descending like a dove and coming to rest on him; and behold, a voice from heaven said, This is my beloved Son, with whom I am well pleased." - Matthew 3:16-17
- "yet for us there is one God, the Father, from whom are all things and for whom we exist, and one Lord, Jesus Christ, through whom are all things and through whom we exist." – 1 Corinthians 8:6
- "But when the Helper comes, whom I will send to you from the Father, the Spirit of truth, who proceeds from the Father, he will bear witness about me. And you also will bear witness, because you have been with me from the beginning." - John 15:26-27
- "And the Word became flesh, and dwelt among us, and we saw His glory, glory as of the only begotten from the Father, full of grace and truth." - John 1:14
- "By common confession, great is the mystery of godliness: He who was revealed in the flesh, Was vindicated in the Spirit, Seen by angels, Proclaimed among the nations, Believed on in the world, Taken up in glory."- 1 Timothy 3:16
- "By this you know the Spirit of God: every spirit that confesses that Jesus Christ has come in the flesh is from God"- 1 John 4:2
- "The angel answered and said to her, "The Holy Spirit will come upon you, and the power of the Most High will overshadow you; and for that reason the holy Child shall be called the Son of God."- Luke 1:35
- "For what the Law could not do, weak as it was through the flesh, God did: sending His own Son in the likeness of sinful flesh and as an offering for sin, He condemned sin in the flesh" - Romans 8:3



Athletics is made up of 3 disciplines; track (running), throwing and jumping.

Section 1 - Track events include; sprints (100m, 200m, 300m), middle distance (800m, 1500m) and relays.

Sprints:
The most important aspect of a sprint is the start (known as a sprint start) as a poor start can lead to the rest of the runners getting past you.
It is also important that you consider:

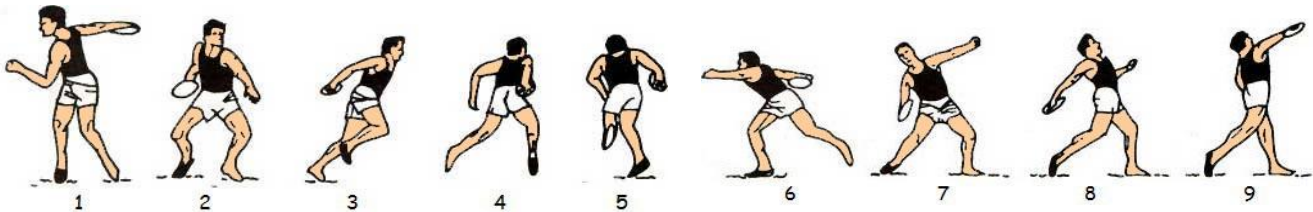
- Leg action (driving forward),
- Arm action (powering forward),
- Upright posture.

Middle distance running:
When running a middle or long distance event it is essential to **pace** yourself. This means not sprinting off but running or jogging at a constant speed for the duration of the event.

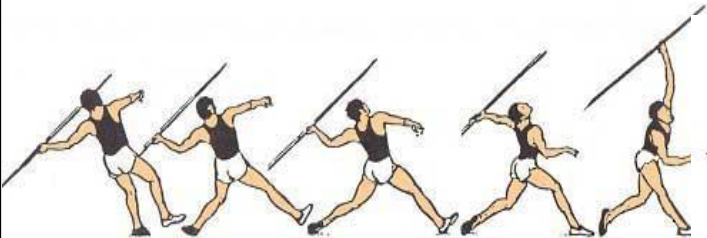
Section 2 - Throwing events include; discus, javelin, shotput.

Teaching points:
Discus: wide stance, hand on top of discus, spread fingers, swing arm back, release high.
Javelin: stand side on, fully extend arm behind, bring arm forward, transfer weight.
Shot-put: stand side on; *dirty fingers, clean palm*, shot starts in neck and **pushes** through, arm points the way shot goes.

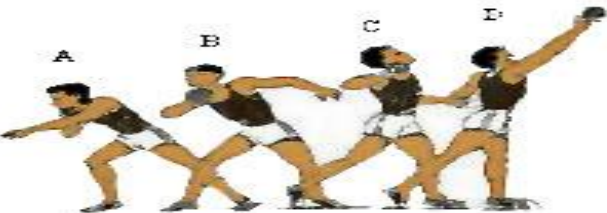
Discus:



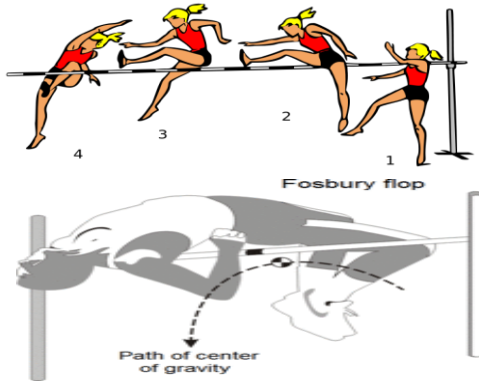
Javelin:



Shotput:



Section 3: High jump (scissor kick vs fosbury flop)



Questions:

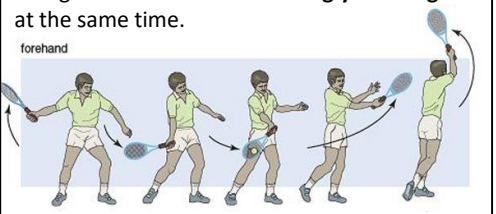
1. Name the 3 disciplines in athletics and give an example for each.
2. What is essential in middle and long distance running and what does this mean?
3. Explain what is happening in the diagrams for discus, shot-put, javelin.
4. Explain the sprinting technique diagram above.



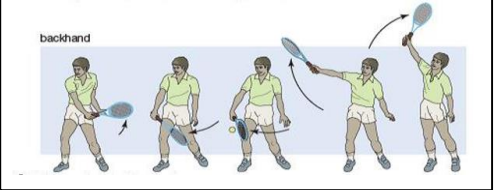
- Striking and fielding includes; **tennis, cricket, rounders, softball** (games where you are hitting (striking) the ball).
- Fielding is the role of the team out in the field trying to stop the striker / runner scoring points by getting them out.
- This varies among different sports but essentially they are 'stumped out'.

- Tennis 1:**
- A game played on a rectangular court either singles or doubles.
 - Players stand on opposite sides of a net and use a racket to hit a ball back and forth to each other.
 - Maximum of one bounce after it has been hit by their opponent to return the ball over the net and within the boundaries of the court – if a player fails to do any of these three things, the opponent wins a point.
 - Game – set – match.

Tennis 2: A **forehand** in tennis is a simple way to return the ball. It is played on your **strong side**, standing side on to the ball and the racket swings back to front **transferring your weight** at the same time.



Tennis 3: A **backhand** in tennis is more technical than a forehand and is played on your weaker side. You should swing the racket to your weak side, make connection with the ball and the racket comes back across the body.

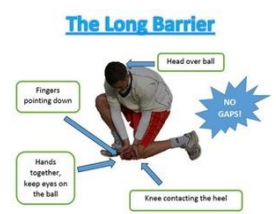


- Cricket:**
- The aim of cricket is simple - score more than the opposition.
 - Two teams, both with 11 players, take it in turns to bat and bowl.
 - When one team is batting, they try and score as many runs as they can by hitting the ball around an oval field.
 - The other team must get them out by bowling the ball overarm at the stumps, which are at either end of a 22-yard area called a wicket.
 - The bowling team can get the batsmen out by hitting the stumps or catching the ball.
 - Once the batting team is all out, the teams swap over and they then become the bowling side.

- Rounders:**
- Two teams with a maximum of 15 players and a minimum of 6 with no more than 9 on the field at one time.
 - The ball must be bowled below the shoulder but above the knee.
 - A rounder is scored if 4th post is reached and half a rounder is scored if 2nd base is reached.
 - You can get the batter out by catching them out or stumping the post they're running to.
 - Softball** consists of a **pitcher, catcher, four infielders, and three outfielders**.
 - A strike is called when the batter swings at a pitch whether it is deemed to be in the strike zone or not.

- Throwing technique:**
- Stand side on, weight on back foot, pull strong arm back, above shoulder height, other arm pointing to target.
 - Transfer weight from back foot, push arm forward, pivot hips to face direction of throw, rotate shoulder / arm towards target.
 - Flick wrist at point of release (at ear) and follow through.

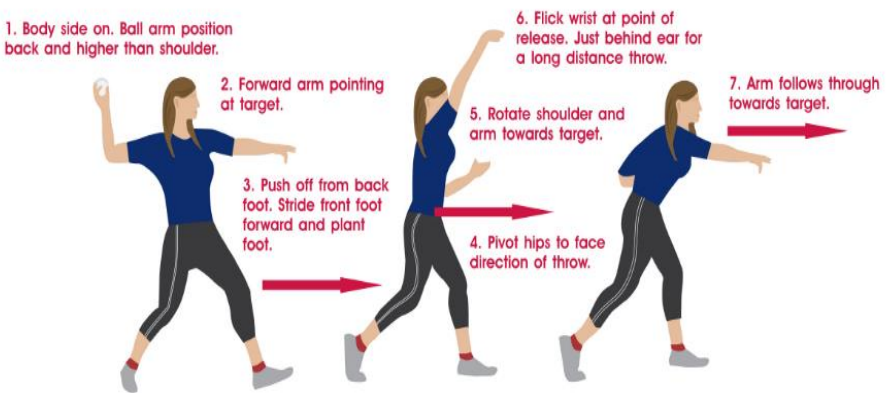
Fielding is an important part of all striking and **fielding** games. Effective fielding is going to prevent the batting / striking team from scoring points by getting players out.
Good fielders need to be able to throw and catch well and also stop the ball not always with their hands (long and short barrier).



The **long barrier** is used in all fielding games if the ball is coming to you along the ground i.e rolling. You kneel down, making a barrier from your leg and foot, cup your hands together, keeping your eye on the ball.

- Catching skills:**
- Hands should be ready at chest height in a *bucket*.
 - Eye on the ball.
 - Step back as you receive and keep the body balanced.

- Questions:**
- Name four sports that are striking and fielding?
 - Explain the long barrier technique in your own words.
 - Explain the throwing technique above in your own words.
 - How do you *get people out* in striking and fielding games?
 - How do you score points in rounders and cricket?
 - Name 2 movements in tennis.





Arithmetic operators (Relational Operators)			
Operation	Symbol	Example	Output
Addition	+	2 + 10	12
Subtraction	-	9 – 6	3
Multiplication	*	5 * 4	20
Division	/	5 / 2	2.5
Floor Division	//	7 // 2	3
Remainder	%	7 % 3	1

Data types (these are types of data that python must be told before you use them-this is called declaring)		
Data Type	This indicates how the data will be stored. The most common data types are integer, string, and float/real.	Casting code
String	A combination of letters, numbers or characters. (eg, Hello, WR10 1XA)	str(x)
Integer	A whole number. (eg. 1, 189)	int(x)
Float/Real	A decimal number, not a whole number. (eg. 3.14, -26.9)	float(x)
Boolean	1 of 2 values. (eg. True, False, Yes, No)	bool(x)
Char	A single character, such as ‘m’	char(x)

Stored Procedure	Function
Supports in, out and in-out parameters,i.e., input and output parameters	Supports only input parameters, no output parameters.
Stored procedures can call functions as needed	The function cannot call a stored procedure
There is no provision to call procedures from select/having and where statements	You can call functions from a select statement
Transactions can be used in stored procedures	No transactions are allowed
Can do exception handling by inserting try/catch blocks	No provision for explicit exception handling
Need not return any value	Must return a result or value to the caller
All the database operations like insert, update, delete can be performed	Only select is allowed

Comparative operators	
==	Equal to
!=	Not equal to (or different to)
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

A **procedure** is a small section of a program that performs a specific task. Procedures can be used repeatedly throughout a program.

Iteration Explained

When designing programs, there may be some instructions that need repeating. This is known as iteration, and is implemented in programming using FOR and WHILE statements. Sometimes an **algorithm** needs to **iterate** steps a specific number of times. In programming, count-controlled loops are implemented using **FOR statements**. **Python** uses the statements **for** and **range** (note the lowercase syntax that Python uses):

Count-controlled loops - using FOR

Sometimes an **algorithm** needs to **iterate** steps a specific number of times. In programming, count-controlled loops are implemented using **FOR statements**. **Python** uses the statements **for** and **range** (note the lowercase syntax that Python uses):

- **for** determines the starting point of the iteration
- **range** states how many times the program will iterate

Consider this simple algorithm for adding up five inputted numbers:

1. set the total to 0
2. repeat this section five times
 - input a number
 - add the number to the total
3. go back to step 2
4. say what the total is

The Python (3.x) code for this algorithm would look like this:

```
total = 0
for count in range(5):
    number = int(input("Type in a number: "))
    total = total + number
print("The total is: ")
print(total)
```

Condition-controlled loops - infinite loops

Sometimes when using a condition-controlled (WHILE) loop there may be a situation where the program loops forever. This situation is known as an **infinite loop**.

How do infinite loops occur?

Condition-controlled loops have a condition that is tested at the start of the iteration to determine whether or not the iteration should occur. With each iteration, the condition is tested again. As long as the condition is being met (ie is **true**), the iteration continues. If the condition is never met, then the program loops infinitely.

Consider this simple algorithm to count up in twos from one to a hundred:

1. set value of count to 1
2. while the value of count does not equal 100
3. say the value of count
4. add 2 to the value of count
5. otherwise, stop

The Python (3.x) program would look like this:

```
count = 1
while count != 100:
    print(count)
    count += 2

def get_capital(country):
    if country == 'India':
        return 'New Delhi'
    elif country == 'France':
        return 'Paris'
    elif country == 'UK':
        return 'London'
    else:
        return None
```

Validation Type	Where	Reason
Presence check	Sales	To make sure that each time the number of sales for each month is entered rather than having blank entries.
Presence check	Name	To make sure that a staff member's name is entered
Format check	Sales	To make sure that the sales are a numerical value

Memory: Find out the purpose
Effect on Performance of
Random Access Memory (RAM) (Volatile)
Faster **RAM** can improve communication speed with the processor and decrease load times.

Read Only Memory (ROM)(Non-volatile)
Increasing the amount of **ROM** in a system could reduce the amount of a program that is installed on a slower disk or other external memory device. It could also be used to store lookup tables that might otherwise be created in RAM which can slow down a program's execution.

Virtual memory: The operating system makes part of the storage drive available to use as **RAM**. ... It copies the data back into **RAM** when the process is needed again. Using **virtual memory** slows the **computer** down because copying to a hard disk takes much longer than reading and writing **RAM**.

Flash memory: Flash memory, also known as flash storage, is a type of nonvolatile memory that erases data in units called blocks and rewrites data at the byte level. Flash memory is widely used for storage and data transfer in consumer devices, enterprise systems and industrial applications. Flash memory retains data for an extended period of time, regardless of whether a flash-equipped device is powered on or off.

Read/Write operations: **Write** caching lets your **computer** store data in a cache before it is written to the hard drive. Because a **computer** can **write** data to a cache much more quickly than to a hard drive, the overall **read/write performance** of the hard drive is improved. Remember, however, that data in a cache is only temporary.

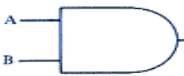
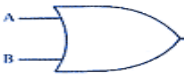
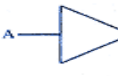
Features affecting performance:: Clock speed (MHz, GHz)
A PC **clock speed** is normally in the gigahertz region. That is a billion cycles per second. Typical **speeds** are two to four gigahertz. The faster the **clock speed**, the faster the instructions can be processed by the **processor**(like a little person collecting parcels and passing them on at a speed).

Cache Memory
Cache plays the greatest part in improving the **performance** of the processors. The larger the **cache** size, the faster the data transfer and the better the CPU **performance**. Small space, close to CPU, where instructions are called from, executed faster.

Multiple cores
This means that a **processor** can be up to **two** or four times faster than a normal **processor**. However the actual speed of the **processor** is dependent on the software that's being run. Not **all** software will take advantage of the quad and dual **cores**.

(Machine code) Binary logic

- Why binary? (transistors) Computers use **binary** - the digits 0 and 1 - to store data. ... The circuits in a computer's processor are made up of billions of **transistors**. A **transistor** is a tiny switch that is activated by the electronic signals it receives. The digits 1 and 0 used in **binary** reflect the on and off states of a **transistor**.

Name	Graphic Symbol	Algebraic Function	Truth Table															
AND		$F = A \cdot B$ or $F = AB$	<table><tr><th>A</th><th>B</th><th>F</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	A	B	F	0	0	0	0	1	0	1	0	0	1	1	1
A	B	F																
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1	0	0																
1	1	1																
OR		$F = A + B$	<table><tr><th>A</th><th>B</th><th>F</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	A	B	F	0	0	0	0	1	1	1	0	1	1	1	1
A	B	F																
0	0	0																
0	1	1																
1	0	1																
1	1	1																
NOT		$F = \bar{A}$ or $F = A'$	<table><tr><th>A</th><th>F</th></tr><tr><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td></tr></table>	A	F	0	1	1	0									
A	F																	
0	1																	
1	0																	

Central processing unit (CPU) – what are the following?

Arithmetic & logic unit: An arithmetic-logic unit (ALU) is the part of a computer processor (CPU) that carries out arithmetic and logic operations on the operands in computer instruction words. In some processors, the ALU is divided into two units, an arithmetic unit (AU) and a logic unit (LU).

Control Unit (CU): A control unit (CU) handles all processor control signals. It directs all input and output flow, fetches code for instructions from micro-programs and directs other units and models by providing control and timing signals. A CU component is considered the processor brain because it issues orders to just about everything and ensures correct instruction execution.

Registers (Memory Unit): A register may hold an instruction, a storage address, or any kind of data (such as a bit sequence or individual characters). Some instructions specify registers as part of the instruction. For example, an instruction may specify that the contents of two defined registers be added together and then placed in a specified register.

Fetch-Decode-Execute: The fetch execute cycle is the basic operation (instruction) cycle of a computer (also known as the fetch decode execute cycle). During the fetch execute cycle, the computer retrieves a program instruction from its memory. It then establishes and carries out the actions that are required for that instruction. The cycle of fetching, decoding, and executing an instruction is continually repeated by the CPU whilst the computer is turned on.

Buses and their Purposes: The **CPU** sits on the motherboard (also called the logic board). **Buses** are circuits on the motherboard that connect the **CPU** to other components. There are many **buses** on the motherboard. A **bys** moves instructions and data around the system.

The Boot Sequence: **Boot sequence** is the **order** in which a computer searches for nonvolatile data storage devices containing program code to load the operating system (OS)

Memory

The computer will have memory that can hold both data and also the program processing that data. In modern computers this memory is RAM.

Control Unit

The control unit will manage the process of moving data and program into and out of memory and also deal with carrying out (executing) program instructions - one at a time. This includes the idea of a 'register' to hold intermediate values. In the illustration above, the 'accumulator' is one such register. The 'one-at-a-time' phrase means that the Von Neumann architecture is a **sequential processing machine**.

Input - Output

This architecture allows for the idea that a person needs to interact with the machine. Whatever values that are passed to and forth are stored once again in some internal registers.

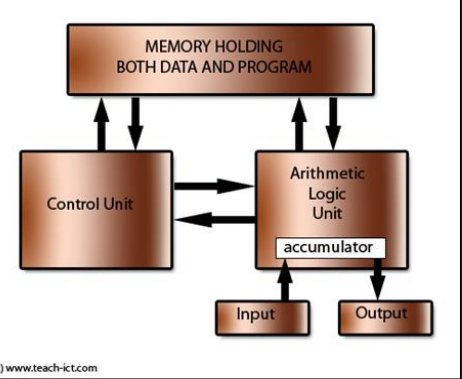
Arithmetic Logic Unit

This part of the architecture is solely involved with carrying out calculations upon the data. All the usual Add, Multiply, Divide and Subtract calculations will be available but also data comparisons such as 'Greater Than', 'Less Than', 'Equal To' will be available.

Bus

Notice the arrows between components? This implies that information should flow between various parts of the computer. In a modern computer built to the Von Neumann architecture, information passes back and forth along a 'bus'. There are buses to identify locations in memory - an 'address bus'

The Von Neumann or Stored Program architecture



Computer Systems

The Input-Process-Output model
Different systems, pros & cons:
- Input-Process-Output model:

General-purpose systems: Personal computers, including desktops, notebooks, smartphones and tablets.
Embedded systems: **embedded systems** are MP3 players, mobile phones, video game consoles, digital cameras, DVD players, and GPS. Household appliances, such as microwave ovens, washing machines and dishwashers, include **embedded systems** to provide flexibility and efficiency

Expert systems: MYCIN: It was based on backward chaining and could identify various bacteria that could cause acute infections. ...

DENDRAL: **Expert system** used for chemical analysis to predict molecular structure.

Types of Software

Applications: Software for the End-User

- Word processor
- Spreadsheets
- Image Editor
- SIMS
- Ticket booking system

Find out about Utilities, what do each of the following do?

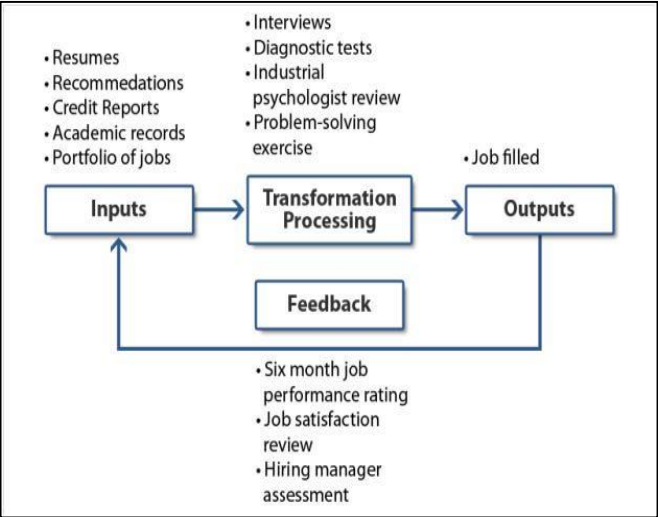
- Antivirus
- Firewall
- System clean up
- Defragmentation
- Task Manager

System software

- Software that controls the hardware: What is an OS and a Driver

Secondary storage (list facts about them)

Magnetic hard disk
Optical disk - Flash memory - Cloud Storage
Non-volatile (disappears after shutting down)
Internal/Removable: *Considerations for selecting storage:* Capacity / Speed / Portability / Durability / Reliability





Play Summary

Act One: Child Labour

Laura is a child. She lives with her mother in a developing country. They have very little money. Laura’s mum tells her that she can no longer go to school because she needs to get a job to support the family financially.

Laura finds a job in a factory that makes trainers. The job is laborious and hard work. She earns very little money. Her manager, Mr. Lee is quite cruel and does not care about her well being, safety or happiness. All he considers is profit.

Act Two: The Bosses

Mr. Lee makes a lot of money by selling the shoes that Laura (and her colleagues) make to big sports shop owners like Mr. Corpone. They laugh about how much profit they are making.

Act Three: Marketing and Consumers

A famous footballers wear the trainers and markets them so that young people wish to buy them. He is paid very well for the advertising.

Teenagers who are clueless about where the trainers have come from or how much the people who made them were paid, go to the sports shop called Con Sports to buy trainers at exorbitant prices.

Act Four: And the Moral is...

The main protagonists remind the audience about how much money they each make from the Trainers industry. They leave the audience with a message about the morals of purchasing trainers from companies that use child labour.

Key Characters:

- Laura** – A poor child
- Mother** – Laura’s Mother
- Mr Lee** – The Trainer factory manager
- Mr Corpone** – The Owner of sports shops
- Footballer** – A famous footballer
- Teenagers** – The people who buy the trainers at high cost

Staging:

- Far East – Laura’s House
- Far East – The Trainer’s Factory
- USA – Football Stadium
- USA – Con Sports - Sports Shop

Themes:

- Child labour exploitation
- Greed
- Poverty
- Consumerism





Sound



- Mark a moment:** Various ways including Sound Effects (SFX) or silence
- Volume:** Loud to quiet
- Crescendo:** Gradually getting louder
- Pitch:** High to low
- Pace:** Fast to slow
- Pause:** Breaks in sound
- Silence:** The removal of all sound
- Contrast:** Opposing sounds (e.g. Loud/quiet, fast pace/slow pace)
- Length of notes:** Sustained (Long notes) Staccato notes (Short sharp notes)
- Reverb:** Echoing effect
- Atmosphere:** The feeling created e.g. cold, scary, romantic, tense, relaxed/calm
- Entrance:** How the sound is first played. (e.g. Dynamic and loud or soft fade in)
- Foley sound:** Replace an original sound (e.g. the digital sound of footsteps)
- Sound Bridge:** The sound from one scene carries over into the next scene.

Diegetic – sound that comes ‘from the world of a story’. This means any sound that is part of the action, and therefore experienced by the actors ‘on stage’. Can include sound effects (SFX) and background noise.

Non-Diegetic doesn’t come directly from the world of the story ‘onstage’. Characters are not aware of it. It usually creates the atmosphere.

Costume, Hair and Makeup

Costume, hair and make-up can suggest character, time and the style of the play, eg naturalistic or abstract. Look at the four pictures of actor Adrian Lester. Note how the change of costume helps the audience to understand the role he is playing.



Things to consider when designing costume, hair and make-up:

- When is the play set?
- Is the play naturalistic or non naturalistic?
- What is the character’s personality?
- What is your character’s status?
- Do the actors need to change?
- What materials will be used?
- What colours will be used?

Make-Up

Bright stage lighting can wash out facial features and make performers appear pale, so make-up is used to enhance features and make sure that the audience can see the actors’ facial expressions. It can also be used to age an actor who is playing an older character or to create fantasy characters. It is worn by both male and female actors.

Colour can be used symbolically. White may represent innocence and purity, and red may represent danger.



Lighting

Stylised Lighting State



Covers specific sections of the stage, harsh colours, hard edges. This does not look like how the sun would light the stage. It is more alien in its appearance.

Naturalistic Lighting State



Soft lighting, covers whole stage, gentle colours. This would look like how the sun would like the stage.

Key Lighting Terms

- Lantern:** The correct term for stage lights
- Gels:** Sheets placed in front of the lights to change the colour
- Intensity:** Full beam or low light or black out
- General Wash:** Covering the stage with light
- Spot Light:** Focusing the light on a specific area of the stage
- Transition:** Slow fade or snap (quick) fade
- Edge:** The edges of the light can be soft or hard
- Gobo:** Create shapes in lighting (e.g. Batman’s emblem)
- Floor Lantern:** Light from below. Creates non-naturalistic shadows. Can look scary
- Cyclorama:** Large white sheet onto which images are projected
- Projection:** Projected images onto a cyclorama
- Crossfade:** When the light travels from one side of the stage to the other
- Lighting State:** The light(s) used in a specific scene
- Blackout:** When the stage is completely dark



Set and Props

Set means the scenery and furniture onstage. Some theatre sets are very elaborate and detailed (naturalistic). However, a simple or minimalistic set can be also be very effective (non-naturalistic). The two images show a row of houses in two different plays. Which one is naturalistic and which one in non naturalistic?

Things to consider when designing Set and Props:

- When is the play set?
- Is the play naturalistic or non naturalistic?
- How can levels create meaning?
- How can proxemics create meaning?
- Are there set changes?
- What materials will be used?
- What colours will be used?
- Will images be projected onto a cyclorama or painted onto flats?

Props

Items that the actors use on stage.

Key Terms for Set and Props

- Flats:** Large sheet of canvas or wood that the scenery is painted on to.
- Fly:** Ropes used to pull flats on/off stage.
- Wings:** The side of the stage
- Apron:** A small piece of stage in front of the Proscenium Arch
- Trap door:** Door covering exit hole in the stage
- Cyclorama:** A large cloth onto which scenery can be projected
- Gobo:** Creates shapes that can be projected
- Birdseye View:** Draw the stage looking down on it.



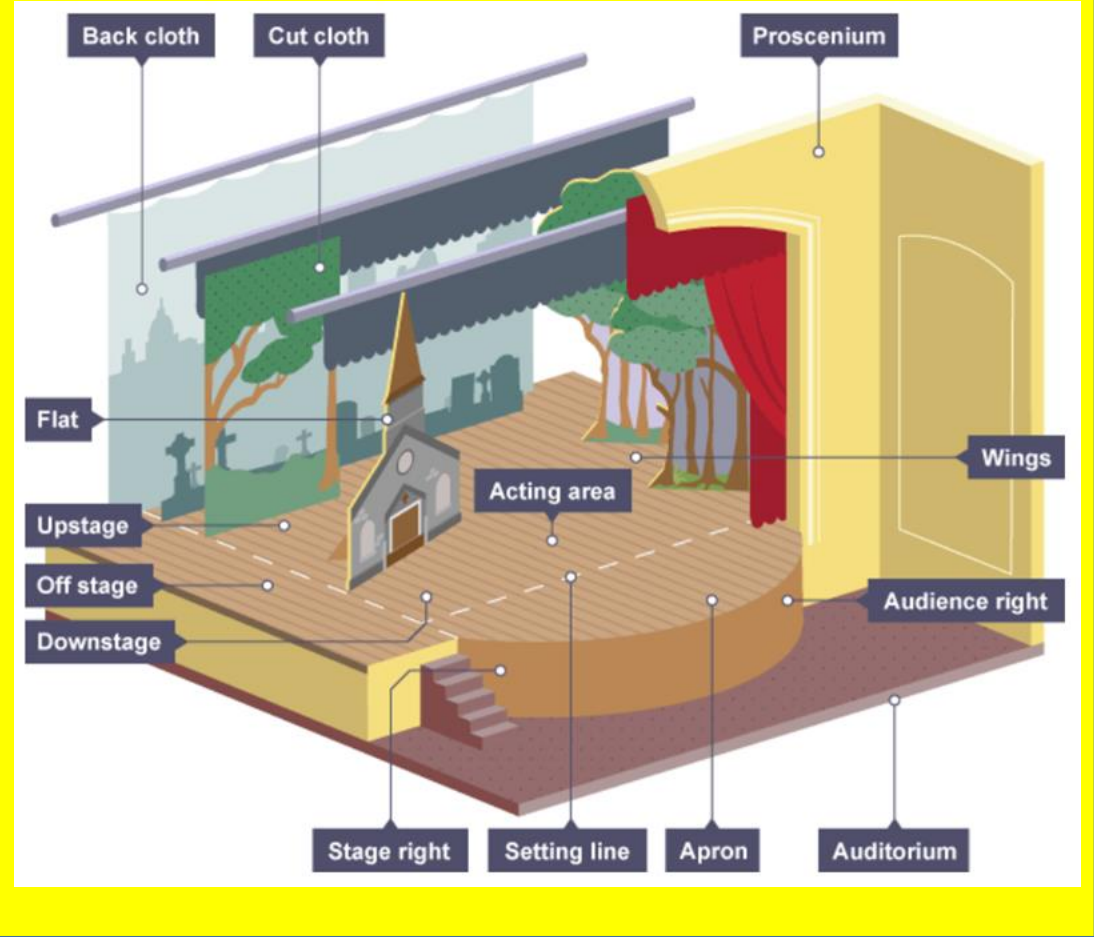
A row of houses in ‘Curious Incident’



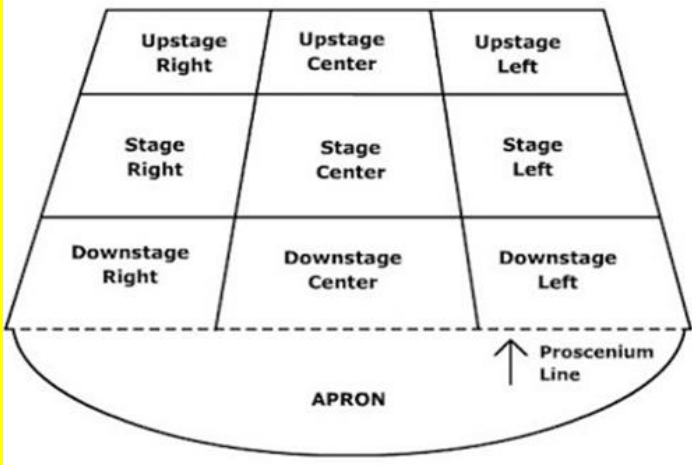
A row of houses in ‘Blood Brothers’



Proscenium Arch



Stage Positions



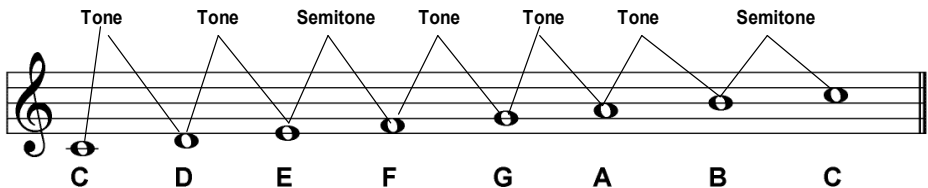


KEYWORDS

- 1- Scale:** a series of notes in ascending and descending order.
- 2- Interval:** the distance between 2 notes.
- 2- Tone:** the interval of two semitones (1 note in between)
- 3- Semitone:** the smallest musical interval. The distance between 2 notes right next to each other (see the keyboard below).
- 12- Octave:** the distance of 8 notes (eg: C to C above or below)
- 4- Chromatic:** ascending or descending by semitones (playing every note, white & black)
- 5- Major:** a scale that has a 'happy' sound to it. Made up from the intervals: T-T-s-T-T-T-s.
- 6- Minor:** a scale that has a 'sad' sound to it. Made up from the intervals: T-s-T-T-s-T1/2-s.
- 7- Tonality:** The scale or key a piece is played in.
- 8- Accidental:** a note that is not in the scale, often using a #, ♭ or ♮.
- 9- Sharp (#):** raising a note by one semitone, often the black note above on a keyboard.
- 10- Flat (♭):** lowering a note by one semitone, often the black note below on the keyboard.
- 11- Natural (♮):** neutralising a # or ♭ returning the note to it's original form.
- 12 – Enharmonic:** the same note with two different names (C# and D♭)

1. Major Scales

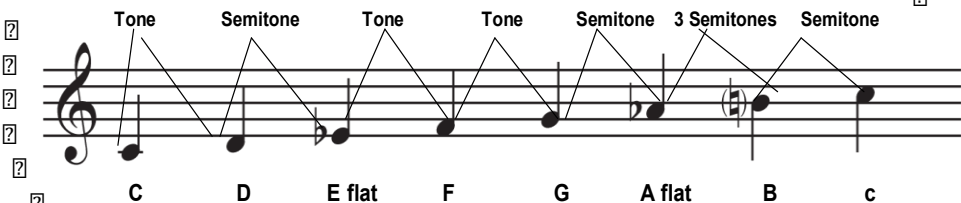
The pattern of tones and semitones shown below is the same for all major scales.



The distance from the bottom C to the top C is called an OCTAVE

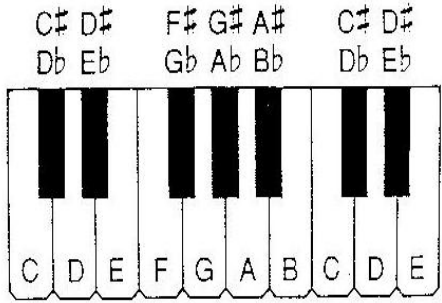
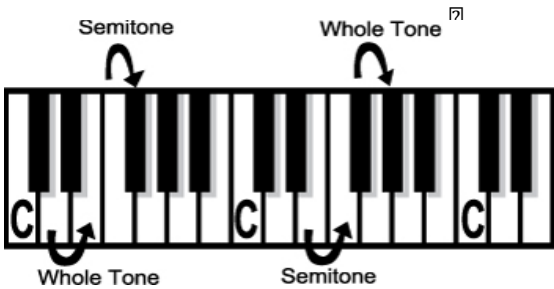
2. Minor Scales

The pattern of tones and semitones shown below is the same for all minor scales.



The distance from the bottom C to the top C is called an OCTAVE

3. Accidentals & Intervals on the Piano





KEYWORDS
1- Structure: the organisation of music into sections.
2- Question and Answer: 2 phrases that occur one after another, the second in direct response, and complimentary to the first.
2- Call and Response: 2 phrases that occur in different parts one after another. Often a solo part then repeated by a chorus (African music).
3- Binary Form: AB form – a structure consisting of 2 contrasting sections.
12- Ternary Form: ABA form – a structure consisting of 2 contrasting sections where the first repeats at the end.
4- Rondo Form: ABACADA – a recurring structure alternating with contrasting sections.
5- Drone: an accompaniment where a note is continuously heard/played throughout a piece
6- Ostinato: a persistent phrase or motif repeated over several bars or more.
7- Phrase: a short musical passage; a musical sentence.
8- Tonality: The scale or key a piece is played in.
9- Major: a scale that has a 'happy' sound to it. Made up from the intervals: T-T-s-T-T-T-s.
10- Minor: a scale that has a 'sad' sound to it. Made up from the intervals: T-s-T-T-s-T1/2-s.
11- Texture: how different parts interact with each other.

A

B

A
A-B-A

B
C-D-C

A
A-B-A

A

B

A

C

A

Section A

Section B

Section A

Match up the diagrams with their respective structures.

Annotate the piece with the musical terms and structural devices



A. Key Terms

Keyword	Description
7. Saturation	Refers to the brightness of colour
2. Negative Space	The space around the actual form of art
3. Focal Point	The area /spot that stands out in the artwork
4. Analogous	A colour scheme where the colours are next to each other on the colour wheel.
5. Bold	(of a colour, design, or shape) having a strong, vivid, or clear appearance.
6. Contemporary	living or occurring at the same time.
7. Collage	a piece of art made by sticking various different materials such as photographs and pieces of paper or fabric on to a backing.

B. Andy Warhol

- 8. August 6, 1928 – February 22, 1987
- 9. Andy Warhol is famous for doing work about iconic people and objects
- 10. Notable for using bright bold designs and the process of printmaking.



11. Marilyn Diptych
1962
Acrylic paint on canvas



12. Campbell soup
1962
Silkscreen Print

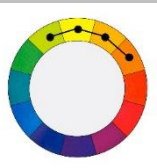
C. Roy Lichtenstein

- 11. October 27, 1923 – September 29, 1997
- 12. Famous American Pop artist
- 13. Known for using a comic book style and working on a large scale.

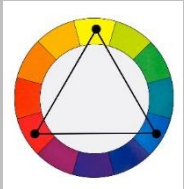


14. Drowning Girl.
1963
Acrylic on Canvas

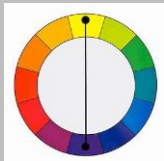
D. Colour Theory



D1. Analogous colour scheme
A colour scheme where the colours are next to each other on the colour wheel. This will give calm mood to your work.



D2. Triadic
A colour scheme where three colours are equidistant to each other on the colour wheel.



D3. Complementary colour scheme
Colours that are opposite each other on the colour wheel. These colours will look bright and bold next to each other.

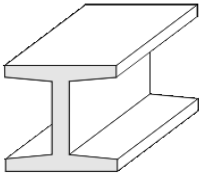
Primary	Secondary
red + yellow	=orange
red + blue	=purple
blue + yellow	=green



Engineering Disciplines		
Mechanical	Electrical and electronic	Aerospace
Communications	Chemical	Civil
Automotive	Biomedical	Software

Beams

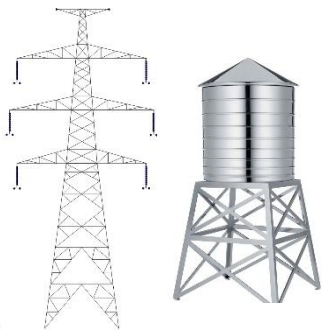
Beams are used to ‘span’ distances, such as the distance between two walls. How well the beam works depends the material it is made from and its shape. In some buildings you can easily see the steel girders that hold the roof up. An I section beam is the most common.



I-SECTION

Triangulation

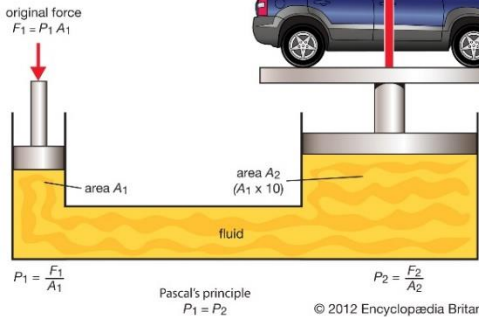
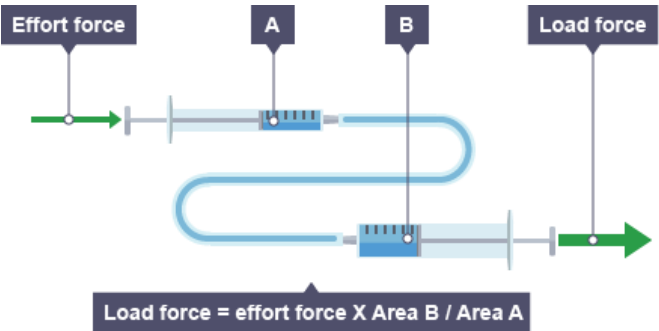
- Examples of triangulation are seen all around us especially in the construction industry (building and civil engineering).
- It is popular for building structures from large to small, permanent to temporary.
- A triangular form is one of the strongest shapes known to man. It is not surprising then that ‘triangulation’ is used in the construction of buildings and structures.



Hydraulics = Uses fluids Pneumatics = uses gas

Hydraulics is a technology and applied science using engineering, chemistry, and other sciences involving the mechanical properties and use of liquids. At a very basic level, hydraulics is the liquid counterpart of pneumatics, which concerns gases.

Fluid mechanics provides the theoretical foundation for hydraulics, which focuses on the applied engineering using the properties of fluids. In its fluid power applications, hydraulics is used for the generation, control, and transmission of power by the use of pressurized liquids.

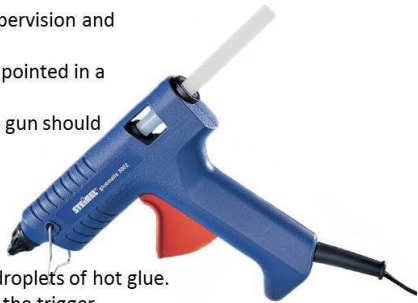


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Health and Safety

Hot Glue Gun

- Always see the teacher for supervision and training using a hot glue gun.
- Always keep the hot glue gun pointed in a safe direction.
- When not in use, the hot glue gun should be stood on its stand (not laid on its side).
- The glue gun may take up to 5 minutes to heat up to melt the glue stick. Light pressure should be applied to release droplets of hot glue.
- Do not use excessive force on the trigger.
- Do not touch the nozzle.
- Avoid contact with the skin.
- If an accident occurs, seek first aid treatment and treat as a burn.
- Make sure the hot glue gun is switched off and left to cool when finished.



Pascal's principle

Pascal's principle, also called Pascal's law, in fluid (gas or liquid) mechanics, statement that, in a fluid at rest in a closed container, a pressure change in one part is transmitted without loss to every portion of the fluid and to the walls of the container. The principle was first enunciated by the French scientist Blaise Pascal. (See left).



Semaine 1

Les vacances en famille • Family holidays

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

Je me prépare • I get myself ready

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

Semaine 2

Les nombres et l'argent • Numbers and money

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

Au café • At the café

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

Quels sont tes rêves? • What are your dreams?

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

Semaine 3

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

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

Semaine 4



LEARNING - LOVING - LIVING

Les mots essentiels • High-frequency

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

Quels sont tes rêves? • What are your dreams?

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

Semaine 5

Special Test : you will only translate from English into French.
Revise the spelling of all vocabulary learnt in Michaelmas2

Semaine 6

Assessments: Writing and Reading



Semana 1

¿Qué hay en tu ciudad? What is there in your town?

Hay...	There is...	una universidad	a university
un castillo	a castle	En...	In...
un centro comercial	a shopping centre	mi barrio	my neighbourhood
un estadio	a stadium	mi ciudad	my town, my city
un mercado	a market	mi pueblo	my village, my town
un museo	a museum	No hay museo.	There isn't a museum.
un parque	a park	No hay nada.	There's nothing.
una piscina	a swimming pool	unos museos	some museums

Semana 2

¿Te gusta vivir en...? Do you like living in...?

Me gusta mucho vivir en...	I like living in... a lot.	porque hay/es...	because there is/it is...
No me gusta nada vivir en...	I don't like living in... at all.		

Semana 3

¿Qué hora es? What time is it?

Es la una.	It's one o'clock.	Son las ocho menos veinte.	It's twenty to eight.
Son las dos.	It's two o'clock.	Son las nueve menos cuarto.	It's quarter to nine.
Es la una y cinco.	It's five past one.	Son las diez menos diez.	It's ten to ten.
Son las dos y diez.	It's ten past two.	Son las once menos cinco.	It's five to eleven.
Son las tres y cuarto.	It's quarter past three.	Son las doce.	It's twelve o'clock.
Son las cuatro y veinte.	It's twenty past four.	¿A qué hora?	At what time?
Son las cinco y veinticinco.	It's twenty-five past five.		

Semana 4

¿Qué haces en la ciudad? What do you do in town?

Son las seis y media.	It's half past six.	ala una	at one o'clock
Son las siete menos veinticinco.	It's twenty-five to seven.	alas dos	at two o'clock
Salgo con mis amigos.	I go out with my friends.	ala cafetería	to the cafeteria
Voy...	I go...	ala playa	to the beach
al cine	to the cinema	de compras	shopping
al parque	to the park	de paseo	for a walk
ala bolera	to the bowling alley	No hago nada.	I do nothing.

Semana 5

En la cafetería In the café	
Yo quiero...	I want...
bebidas	drinks
un batido de chocolate/ de fresa	a chocolate/strawberry milkshake
un café	a coffee
una Coca-Cola	a Coca-Cola
una Fanta limón	a lemon Fanta
un granizado de limón	an iced lemon drink
un té	a tea
raciones	snacks
calamares	squid
croquetas	croquettes
	gambas
	jamón
	pan con tomate
	patatas bravas
	tortilla
	¿Algo más?
	No, nada más.
	¿Y de beber?
	¿Cuánto es, por favor?
	Son cinco euros setenta y cinco.
	prawns
	ham
	tomato bread
	spicy potatoes
	Spanish omelette
	Anything else?
	No, nothing else.
	And to drink?
	How much is it, please?
	That's 5,75 €.



Semana 6

¿Qué vas a hacer? What are you going to do?	
Voy a salir con mis amigos.	I am going to go out with my friends.
Vas a ver la televisión.	You are going to watch TV.
Va a ir de paseo.	He/She is going to go for a walk.
	Vamos a jugar al voleibol.
	We are going to play volleyball.
	Vais a chatear.
	You are going to chat.
	Van a hacer los deberes.
	They are going to do their homework.
¿Cuándo? When?	
este fin de semana	this weekend
el sábado por la mañana	on Saturday morning
el domingo por la tarde	on Sunday afternoon/ evening
primero	first
	luego
	then
	finalmente
	finally
	a las tres de la tarde
	at three o'clock in the afternoon
	(un poco) más tarde
	(a little) later

Palabras muy frecuentes High-frequency words	
aquí	here
a ver	let's see
con	with
	hasta
	more
	más
	until



1	¡Hola! Me llamo María y tengo doce años.	¡Hello! My name is María and I am twelve years old.
2	Antes vivía en un pueblo en la montaña.	Before I used to live in a village in the mountains.
3	La casa era amplia pero menos moderna que la de ahora.	The house was spacious but less modern than the one now.
4	Pero me gustaba porque era grande y cómoda.	but I used to like it because it was big and comfortable.
5	Además la casa tenía una chimenea chula en el salón	In addition, the house had a cool chimney in the living room
6	y una terraza muy bonita con vistas a la montaña.	and a very nice terrace with views to the mountains
7	En el pueblo no había demasiada gente. ¡Qué rollo!	In the village there weren't many people ¡How boring!
8	pero se podía ir a una pista de karting en coche	but you could go to the go-karting track by car
9	y también se podía hacer senderismo.	And also you could do trekking .
10	El verano pasado fui a la montaña con mis amigos,	Last summer I went to the mountains with my friends,
11	comimos bocadillos y jugamos a las cartas.	We ate sandwiches and we played cards.
12	Diría que fue la bomba.	I would say that it was awesome.
13	Sin embargo, ahora vivo en un piso en la ciudad.	However, now I live in a flat in the city.
14	Mi casa tiene dos cuartos de baño, una cocina	My house has two toilets, a kitchen
15	y además un comedor, sin embargo no tiene una piscina.	and in addition a dining room, however it hasn't got a pool
16	Diría que la casa es lujosa y moderna,	I would say that the house is luxurious and modern,
17	aunque no es más grande que las casas de mis amigos,	although it is not bigger than my friend's house
18	me encanta ya que está cerca del centro de la ciudad.	I love it because it is near the centre of the city
19	De hecho en mi ciudad hay muchos lugares de interés;	In fact, in my city there are lots of places of interest;
20	Por ejemplo se puede ver la catedral y monumentos	For example, you can see the cathedral and monuments
21	Es súper guay porque hay una bolera y una pista de tenis.	It is very cool because there is a bowling alley and a tennis court
22	Este fin de semana voy a ir al cine con mis amigos,	This weekend I am going to go to the cinema with my friends,
23	vamos a ver una película y vamos a jugar al fútbol	We are going to watch a movie and we are going to play football
24	Va a ser maravilloso porque me gusta pasar tiempo	It is going to be marvellous because i like to spend time
25	con mis amigos y me encanta ver películas.	with my friends, and I enjoy to watch movies.
26	En el futuro me gustaría vivir en una casa cerca de la playa,	In the future, I would like to live in a house near the beach,
27	Además quiero tener un dormitorio bastante grande	In addition I want to have a quite big bedroom
28	e incluso una piscina en el jardín.	and even a pool in the garden.
29	Sería la bomba, ¿No crees?	It would be awesome, don't you think?
30	¿y a ti? ¿Cómo es tu casa o piso dónde vives?	And you? What is your house or flat like?
31	¿Dónde te gustaría vivir en el futuro?	Where would you like to live in the future?



First Aid Key term	Definition
1. Abrasion	Medical term for a graze to the skin. An abrasion is damage to the superficial layers of the skin.
2. Adrenaline	A hormone released by the adrenal glands (just above the kidneys). It increases the heart rate and causes blood vessels to constrict. This hormone is responsible for the 'fight or flight' response.
3. Anaphylaxis	A life-threatening whole body allergic reaction which causes airway swelling and shock.
4. Concussion (head injury)	An injury to the brain which causes 'shaking' / 'jarring' of the brain.
5. Contusion	A bruise (bleeding beneath the skin)
6. Epi-pen	An auto-injecting syringe containing adrenaline used to counteract a major allergic reaction
7. Epilepsy	A medical condition characterised by repeated seizures. May be controlled by medication
8. Hyperglycaemia	High blood sugar levels
9. Hypoglycaemia	Low blood sugar levels
10. Insulin	A hormone produced by the pancreas that reduces blood sugar levels
11. Cardio	Relating to the heart
12. Pulmonary	Relating to the lungs
13. Resuscitation	the action or process of reviving someone from unconsciousness
14. Primary survey	The quick initial assessment of a patient. Often structured in an 'ABC' approach (airway, breathing, circulation)

First Aid Tips



MAJOR BLEEDING

- 1. ✓ Call 911 and put on gloves (or a plastic bag) ✓ Have person lie down with head lower than body.
- 2. ✓ Remove obvious objects from wound, but don't clean it.
- 3. ✓ If organs have been displace, do not push them back in, simply cover the wound.
- 4. ✓ Apply direct pressure with gauze / clothing until bleeding stops (don't "look" for at least 20 min), and apply pressure around deeply embedded objects, not over them.
- 5. ✓ Do not remove gauze / bandage. Simply keep adding more as needed
- 6. ✓ If limb (arm / leg) is bleeding, elevate it.

HANDS-ONLY CPR (Cardio Pulmonary Resuscitation)

- 1. ✓ Call 911
- 2. ✓ Push hard and fast at the center of the chest
- 3. ✓ IMPORTANT: Hands-Only CRP is most effective if used after you SEE a teen or adult suddenly collapse. If you are trained in conventional CPR, you should use it if victim is found unconscious.

15. Laceration	An injury where there is cutting or tearing of the skin
16. Recovery position	A position where the casualty is laying on their side to protect their airway

