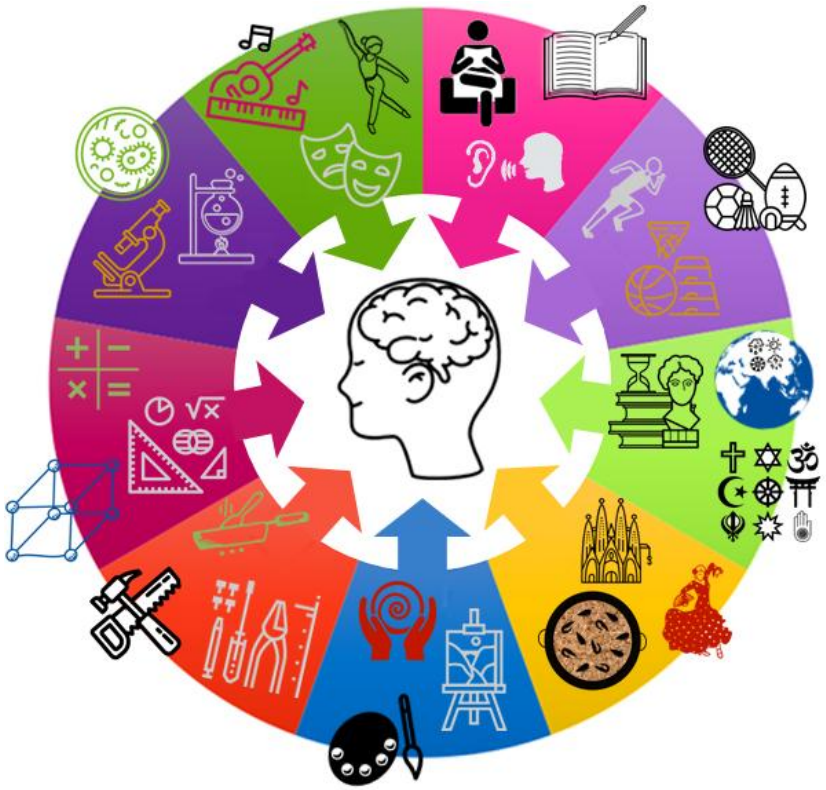
100% book - Year 11 Booster

Aim to memorise 100% of the knowledge on these Knowledge Organisers.



Term 2

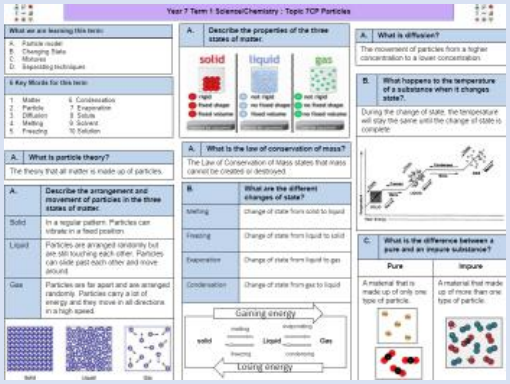
Swindon Academy 2026-27	
Name:	
Tutor Group:	
Tutor & Room:	

"If you are not willing to learn, no one can help you.
If you are determined to learn, no one can stop you."

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How to use your 100% book of Knowledge Organisers and Quizzable Organisers

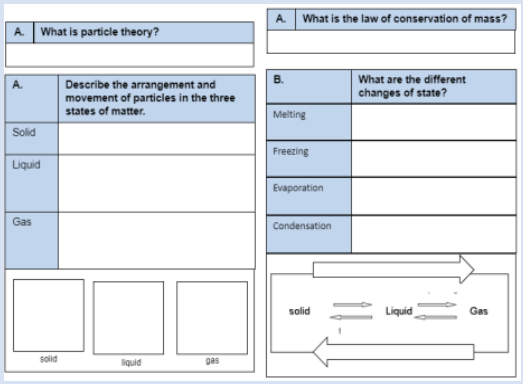
Knowledge Organisers



Knowledge Organisers contain the essential knowledge that you MUST know in order to be successful this year and in all subsequent years.

They will help you learn, revise and retain what you have learnt in lessons in order to move the knowledge from your short-term memory to long-term memory.

Quizzable Knowledge Organisers



These are designed to help you quiz yourself on the essential Knowledge.

Use them to test yourself or get someone else to test you, until you are confident you can recall the information from memory.

Top Tip

Don't write on your Quizzable Knowledge Organisers! Quiz yourself by writing the missing words in your prep book. That way you can quiz yourself again and again!

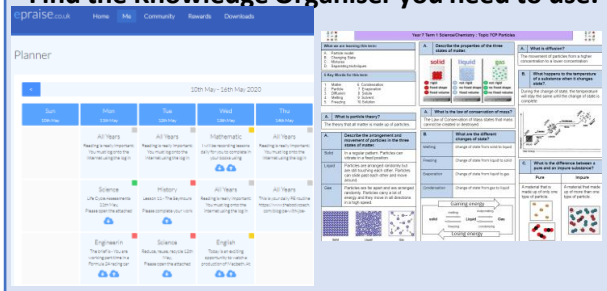
Expectations for Prep and for using your Knowledge Organisers

1. Complete all prep work set in your subject prep book.
2. Bring your prep book to every lesson and ensure that you have completed all work by the deadline.
3. Take pride in your prep book – keep it neat and tidy.
4. Present work in your prep book to the same standard you are expected to do in class.
5. Ensure that your use of SPAG is accurate.
6. Write in blue or black pen and sketch in pencil.
7. Ensure every piece of work has a title and date.
8. Use a ruler for straight lines.
9. If you are unsure about the prep, speak to your teacher.
10. Review your prep work in green pen using the mark scheme.

How do I complete Knowledge Organiser Prep?

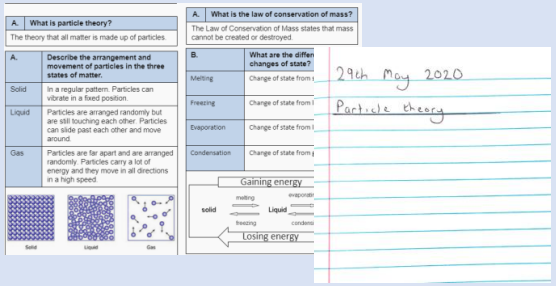
Step 1

Check Epraise and identify what words /definitions/facts you have been asked to learn. Find the Knowledge Organiser you need to use.



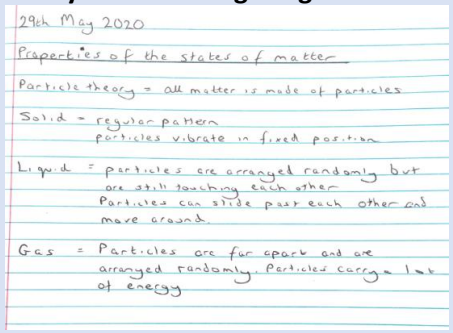
Step 2

Write today's date and the title from your Knowledge Organiser in your Prep Book.



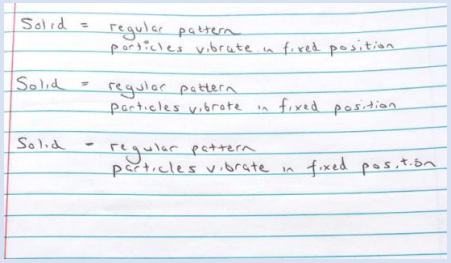
Step 3

Write out the keywords/definitions/facts from your Knowledge Organiser in FULL.



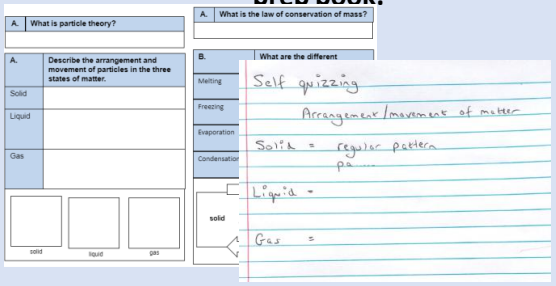
Step 4

Read the keywords/definitions/facts out loud to yourself again and again and write the keywords/definitions/facts at least 3 times.



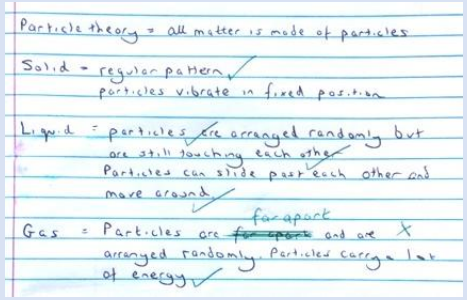
Step 5

Open your quizzable Knowledge Organiser. Write the missing words from your quizzable Knowledge organiser in your prep book.



Step 6

Check your answers using your Knowledge Organiser. Repeat Steps 3 to 5 with any questions you got wrong until you are confident.



Make sure you bring in your completed Prep notes to demonstrate that you have completed your prep.

AN INSPECTOR CALLS Foundation

1. Context

Playwright: JB Priestley (1894-1984)
Dates: Written in 1945
First performed: In Moscow, Russia, in 1945
Era: Edwardian
Genre: Drama
Set: Fictional town Brumley 'an industrial city in the north Midlands' in 1912
Structure: Three Act Play

Biography of Priestley
- Born in Yorkshire in 1894.
- Fought in the first world war
- Became concerned with the effects of social inequality in Britain in 1930s
- Set up a new political party in 1942, The Commonwealth Party. It merged with the labour Party and was integral in developing the welfare state

Pre and Post War – Before the first world war, many people didn't believe that a war would take place. There were strong distinctions between upper and lower classes, society was deeply patriarchal. After the second word war ended in 1945, class distinctions had been greatly reduced by the two wars and women had earned a more valued place in society After 1945 there was a desire for more sweeping social change.

Socialism – Socialism is a political belief in greater levels of equality. Socialism is generally concerned with ensuring that differences between wealth and social status are erased from society. After the two World Wars British society was far more open to socialist ideas. In *An Inspector Calls*, the Inspector presents socialist attitudes.

Social and Moral Responsibility – Attitudes towards social and moral responsibility changed rapidly in the tine between when the play was set (1912) and the time the play was written (1945). In 1912 the general attitude of those with social status and wealth was towards looking after one's own. By the mid-1940s however, the Labour party under Attlee won a landslide election reflecting a wave of enthusiasm towards communal responsibility for everyone in society.

The Titanic – RMS Titanic was a British passenger liner that sank in the North Atlantic ocean in the morning hours of 15th April 1912, killing around 1500 people. The Titanic was designed to be the pinnacle of both safety and comfort, and due to its enormous size and quality was frequently labeled 'unsinkable'. In *An Inspector Calls* Birling claims this, thus immediately losing the respect of the audience. It can serve as a symbol of the hubris and arrogance of man.

FORM – The play fits into three possible forms:

Well-Made Play
- A popular type of drama from the 19th century
- The events build to a climax
- Plot is intricate and complex

Morality Play
- Most popular during 15th and 16th centuries
- They taught the audience lessons that focused on the seven deadly sins
- Characters who committed those sins were punished

Crime Thriller
- Involves a gripping tale based around a crime
- The audience receives clues and must guess what has happened before the end
- All is revealed by the climax

2. Key Characters

Inspector Goole: An mysterious figure who serves as Priestley's mouthpiece and advocates social justice. He serves as the Birling's conscience and exposes their sins.

Mr Arthur Birling: A capitalist and business owner who opposes social change and greater equality. He is a self-made man and lacks the refined manners of the upper classes. Made a fool by Priestley to highlight the arrogance and absurdity of his views.

Mrs Sybil Birling: Her husband's social superior, Mrs Birling is involved in charity work but contradictorily believes in personal responsibility and looking after one's-self. Fails to understand her own children.

Shelia Birling: Young and initially enthusiastic, Sheila grows and changes throughout the play, embracing the views of the Inspector and challenging the social indifference of her parents. She becomes wiser and more cautious in her relationship with Gerald.

Eric Birling: In his early twenties, he drinks too much and forces himself upon Eva Smith. Whilst she is pregnant with his child, he steals from his father to attempt to support her. Grows and changes, realises his own wrongs along with everyone else's. Critical of parents.

Gerald Croft: A businessman engaged to Sheila, Gerald a relationship with Daisy Renton (Eva Smith). Even though he sits between he two generations he is politically closest to Birling and fails to embrace the Inspector's message, instead seeking to prove he wasn't real.

Eva Smith: Doesn't appear in the play, but her suffering and abuse represents that of all the working classes. She also calls herself both Daisy Renton and Mrs Birling. The older characters begin to question whether she really is one person.

3. Central Themes

Social Responsibility	Priestley advocates a socialist message of collective responsibility for one another. The Inspector serves as his voice in conveying this ideology, but the younger generation also come to embrace it. The suffering of Eva Smith highlights the powerlessness of the working classes and the need for a society that protects is most vulnerable.
Age and the Generational Divide	Priestley presents a view that there is hope for change and that it lies with the younger generation. Both Sheila and Eric change for the better, maturing and becoming more empathetic as they come to embrace the Inspector's message. They also become vocal critics of their parents' indifference to Eva's suffering.
Class and Power	Priestley highlights the immense power that business owners wielded over their workers and presents them as arrogant and lacking in empathy. He demonstrates Edwardian society's preoccupation with wealth and status at the cost of the individual as a way of promoting change in post-WW2 Britain.
Gender	At the time the play was first performed, women had just played a pivotal role in World War 2 and were empowered by the freedom work provided them. In the 1912 setting, we see Sheila's growing independence vs her mother. However, the play still highlights the awful vulnerability of women and the outdated stereotyping of them.

4. Key Vocabulary

Capitalist	Believing in private wealth and business aimed at making profit for business owners. Independent and self-reliant.
Socialist	Believing in shared ownership, collective responsibility for one another and social equality for all.
Ideology	A political viewpoint or set of beliefs, for example socialism.
Responsibility	Being accountable or to blame for something, or having a duty to deal with something.
Hierarchy	A ranking of status or power e.g. the strict class hierarchy of Edwardian England.
Patriarchy	A society in which power lies with men.
Prejudice	An opposition to or opinion about something/someone based upon what they are e.g. working class, female etc.
Morality	The belief that some behaviour is right and some is wrong.
Proletariat	The working class.
Bourgeoisie	The capitalist class in possession of the means of acquiring wealth.
Aristocracy	The highest class in society and often holding titles passed from father to son, for example Lord and Lady Croft.
Façade	A false front or surface-level illusion, for example the façade of family happiness in the opening scene of the play.
Catalyst	Someone or something that speeds up or triggers an event.
Antithesis	When something is the opposite of something else.

5. Key Terminology, Symbols and Devices

Dramatic Irony	When the audience is aware of something that a character is not aware of, for example Birling believing war won't happen.
Plot Twist	When a story suddenly departs from its expected path and something very unexpected happens. The final phone call.
Cliffhanger	Each act ends on a particularly dramatic, revealing moment that creates a sense of tension and anticipation.
Stage Directions	When the playwright instructs actors/director to perform in a particular way. Priestley's are unusually detailed.
Entrances/Exits	Characters frequently leave or enter the stage at dramatic moments. Some characters miss important events.
Lighting	Priestley uses stage directions to indicate how the stage should be lit. Changes to 'brighter and harder' for Inspector.
Props	Physical objects used in the play. The photograph plays a key role in identifying Eva. The doorbell interrupts Birling.
Contrast and Juxtaposition	Deliberately placing two very different things along side one another to draw comparisons e.g. Birling and the Inspector.

AN INSPECTOR CALLS Foundation

1. Context

Playwright: **Dates:** **First performed:** **Era:** **Genre:** **Set:** **Structure:**	**Biography of Priestley** • • • •
Pre and Post War –	**Socialism –**
Social and Moral Responsibility –	**The Titanic –**

FORM – The play fits into three possible forms:

Well-Made Play	Morality Play	Crime Thriller
•	•	•
•	•	•
•	•	•

2. Key Characters

Inspector Goole:
Mr Arthur Birling:
Mrs Sybil Birling:
Shelia Birling:
Eric Birling:
Gerald Croft:
Eva Smith:

3. Central Themes

Social Responsibility	
Age and the Generational Divide	
Class and Power	
Gender	

4. Key Vocabulary

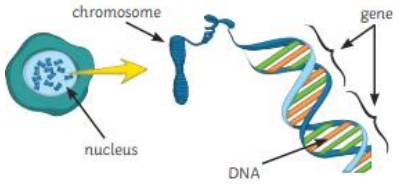
Capitalist	
Socialist	
Ideology	
Responsibility	
Hierarchy	
Patriarchy	
Prejudice	
Morality	.
Proletariat	
Bourgeoisie	
Aristocracy	
Façade	
Catalyst	
Antithesis	

5. Key Terminology, Symbols and Devices

Dramatic Irony	.
Plot Twist	
Cliffhanger	
Stage Directions	
Entrances/Exits	
Lighting	
Props	
Contrast and Juxtaposition	

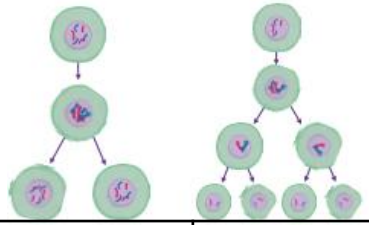
B6 – Inheritance, Variation and Evolution

Cells and cell division



The chromosomes are in the nucleus of cells
Humans have 46 chromosomes.
Chromosomes contain genes, which code for proteins.
In body cells, chromosomes are in pairs – one from each parent.
In sex cells (gametes) they are not in pairs and there is half the number of chromosomes (e.g. 23 in humans)

Cell division – two types:



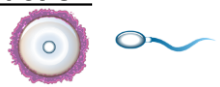
Mitosis (in all body cells)	Meiosis (in testes and ovaries)
2 daughter cells	4 daughter cells
Daughter cells = genetically identical	Daughter cells = not genetically identical
Cell divides once	Two divisions
Daughter cells **have same number** of chromosomes as original cell	Daughter cells **have half** the chromosomes as original cell
Used for growth and repair.	Produces gametes for sexual reproduction

Reproduction

Two types of reproduction – sexual and asexual.

	Sexual	Asexual
Number of parents	2	1
gametes used?	Yes	no
Variation in the offspring	lots	None (unless mutations occur) Offspring are clones

Sexual reproduction

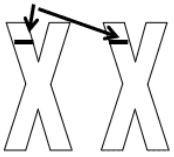


The sperm and egg have half of the genes for the offspring. (in humans 23 chromosomes)
At fertilisation, the sperm and egg nuclei join. (23 + 23 = 46 chromosomes)

There are two genes for any one characteristic – one on the chromosome from mum and one from Dad
Different forms of the same gene are called **alleles**
If the alleles are the same, the person is **homozygous**
If the alleles are different the person is **heterozygous**

E.g.:
B = brown hair (dominant)
b = red hair

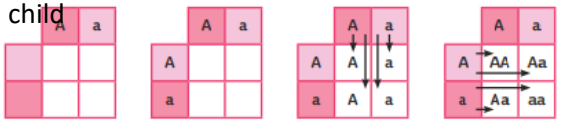
Gene from each parent



BB = homozygous, brown hair
Bb = heterozygous, brown hair
bb = homozygous, red hair

How to complete a punnet square

If A = blue eyes, a = green eyes
Calculate the probability of two heterozygous people having a green eyed child



Step 1
Put one parents alleles into the boxes at the top

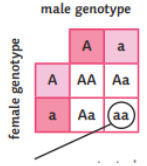
Step 2
Put the other parents alleles into the boxes down the side

Step 3
Write the alleles from parent one in all boxes underneath

Step 4
Put the alleles from the second parent into the boxes to the right

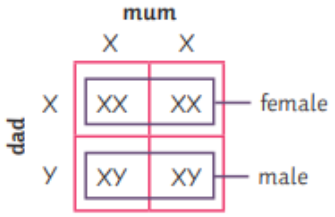
Probability

A green eyed child would have aa genotype.



One of these four has the type aa – that's ¼ , 25% or 0.25.

Sex Determination



Females carry two X chromosomes (XX)
Males carry one X and one Y chromosome (XY)
50% chance of male and female.

B6 – Inheritance, Variation and Evolution

1. Put these in order from smallest to biggest:

   Allele, Cell, Chromosome, Gene, Nucleus

2. What are the two types of cell division?

3. When does mitosis take place?

4. Where does meiosis take place?

5. How does the number of chromosomes in a gamete differ from those of a body cell?

6. What do genes do?

1. What are the two types of reproduction?

2. How many parents are needed for asexual reproduction?

3. What are the offspring of asexual reproduction known as?

4. What is the term for when a sperm and an egg join?

5. How many genes do we have for any single characteristic?

6. What term is used to describe a person that has two alleles that are the same for a particular characteristic?

1. What two sex chromosomes do females carry?

2. What two chromosomes do males carry?

3. What is the probability of having a boy?

4. Complete the punnet square:

	D	d
d		
d		

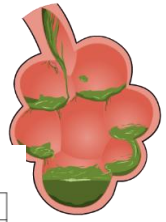
5. What is the chance of having an offspring with the allele pair dd?

B6 – Inheritance, Variation and Evolution

Inherited disorders

Cystic fibrosis
Disorder of cell membranes
Caused by a recessive allele
Causes thick mucus to form in membranes
Main organs affected are lungs, digestive & reproductive organs – pancreas and intestines.

Alveoli get blocked with mucus
Increases diffusion path so less O_2 gets into the blood



♂ Father / ♀ Mother

	C	c
C	CC	Cc
c	Cc	cc

Polydactyly
Disorder of the hands and feet
Caused by a dominant allele
Causes extra digits, fingers and toes.



Embryo screening
Parents that have inherited disorders may opt for embryo screening

1. Multiple embryos are made in IVF
2. One cell is removed from each embryo
3. The cells are screened for faulty genes
4. Only embryos without the genes for disorders are transferred to the womb of the mother.

\+ Babies born free of that inherited disorder
- no guarantee child will be free of other health issues
- Many embryos are destroyed, which are potential human lives

Variation

May be due to differences in:
- Genes that have been inherited(genetic causes)
- Conditions which they have lived in (environmental causes)

- Combination of genes and the environment.

Mutation = a change in the DNA during copying (randomly). Often has no effect on the gene, but sometimes leads to new proteins being made and a new characteristic being seen

Evolution



Evolution = a change in inherited characteristics of a population over time through natural selection – could lead to a new species.
A **species** is a group of organisms that can successfully breed.
Theory of evolution states that all species have evolved from a simple life forms more than 3 billion years ago.

Natural Selection

Described by Darwin
1. **Variation** within a species – different genes. (due to **mutation**)

2. One gene may give characteristics that are better **adapted** for survival in the environment.

3. Those with **advantageous genes** will survive and reproduce – passing genes to **offspring**.

4. Over long periods of time, all members of that species have the characteristic, may even lead to a new **species**.

Extinction

Extinction = no remaining individuals of a species still alive on Earth.

Factors which could cause extinction:
- New disease
- Rapid change in environment (e.g. meteor/volcano eruption)
- New predators
- New competitors (often man)



Evidence for evolution

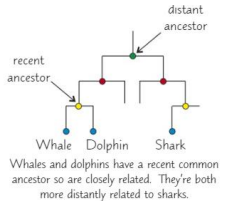
Fossils

Fossils are the **remains of plants or animals** from **millions of years ago:**
They are formed in different ways:
- Remains of an organism that has not fully decayed as one of the decay conditions was absent (e.g. too cold, not enough O_2)
- Mineralised forms of the harder parts of an organisms (such as bones)
- Traces of organisms such as footprints or burrows.

Many early life forms were **soft bodied** so have left few traces behind, as they decayed so we cannot be sure how life started on Earth. Many have been destroyed by Earth's rock cycle. Fossils help us understand how much or little organisms have changed as life developed on Earth.

Evolutionary trees

Show how species have volved from and are related to others



B6 – Inheritance, Variation and Evolution

1. What is cystic fibrosis a disorder of?
2. Is the allele for cystic fibrosis dominant or recessive?
3. Why do cystic fibrosis sufferers struggle to get oxygen into the body?
4. What is polydactyly?
5. Is the allele for polydactyly dominant or recessive?
6. Give one advantage of embryo screening
7. Give one disadvantage of embryo screening

1. What are the two causes of variation?
2. What is a mutation?
3. Which scientist proposed the theory of evolution by natural selection?
4. What is the theory of evolution?
5. What is a species?
6. Why do mutations sometimes lead to new characteristics being seen?

1. What does 'extinct' mean?
2. What are fossils?
3. Describe one way fossils can form
4. What do fossils show us?
5. Why is the fossil record incomplete?
6. What factors can cause extinction?

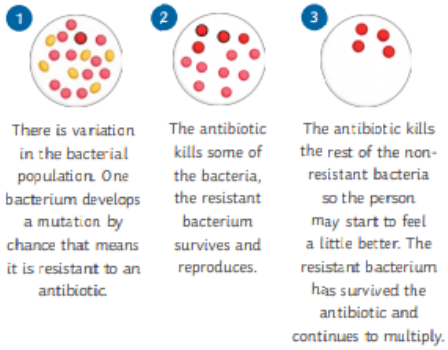
B6 – Inheritance, Variation and Evolution

Resistant Bacteria

- Bacteria **evolve** rapidly as they reproduce at a fast rate. (reproduce approx. every 20 mins)
- Mutations of bacteria can produce new strains.

- Some strains are **resistant** to antibiotics (so are not killed).
- They **survive** and **reproduce** – population of resistant strain rises.
- Resistant strain will spread because people are not **immune** and there is no effective treatment.

- **MRSA** is **resistant** to antibiotics.



How to reduce antibiotic resistant strains:

- Doctors should not prescribe antibiotics for viral infections

- Patients must complete courses of antibiotics

- Agricultural use of antibiotics should be restricted.

Genetic Engineering

- Process which involves modifying the **genome** of an organism by introduction a gene from another organism to give a **desired characteristic**.

Uses of genetic engineering:

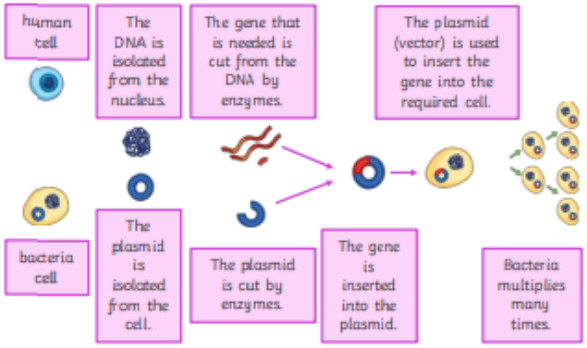
- Plant crops to be **resistant** to diseases or produce bigger, better fruits.

- Bacteria cells to produce useful substances, such as human insulin to treat diabetes.

Genetically modified (GM) crops

Advantages	Disadvantages
Resistant to insect attack	Not sure on long term effects when eating GM crops
Produce increased yields	Could affect populations of wild flowers and insects

Process of Genetic Engineering (HT only)

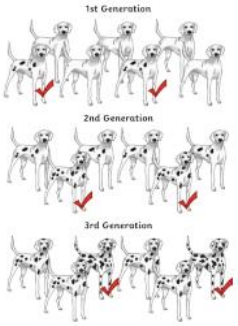


Selective Breeding

- Process which humans breed plants and animals for particular **genetic characteristics**.

Steps of selective breeding:

1. Choose a male and female with **desired characteristics.**



2. Breed together

3. Pick the offspring which have the desired characteristic and breed together.

4. Continue over many generations, selecting the best offspring each time, until all offspring show desired characteristics.

Classification

Linnaeus classified things into: Kingdom, phylum, class, order, family genus and species.

Organisms are named by the **binomial system** of genus and species. (2 names)

Due to evidence from chemical analysis, there is now a 'three-domain system' by Carl Woese:

Domain	bacteria	archaea	eukaryota			
Kingdom	eubacteria	archaebacteria	protista	fungi	plantae	animalia

B6 – Inheritance, Variation and Evolution

1. Why do bacteria evolve rapidly?
2. What can cause new strains of bacteria?
3. Name a bacteria which is resistant to antibiotics.
4. What are the three ways to reduce antibiotic resistance strains?

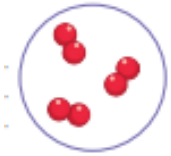
1. What is genetic engineering?
2. State two uses of genetic engineering.
3. What does 'GM' stand for?
4. State two advantages of GM crops.
5. State two disadvantages of GM crops.
6. Describe the stages of genetic engineering (HT only).

1. 1. What is selective breeding?
2. Describe the four stages of selective breeding.
3. Why might a characteristic be chosen?
4. Give 3 examples of characteristics humans may choose.

1. How did Linnaeus classify organisms?
2. What are Carl Woese's three domains?
3. What does 'binomial' mean?

C8 – Chemical Analysis

Pure substances



Pure = single element or compound – not mixed with any other substance.

Testing to see if a substance is pure:
- Pure substances have specific melting and boiling points

- Compare your data to a library of known values.

E.g. Water has a boiling point of 100°C, if it is above or below this, it is not pure.

Formulations

Formulation = a mixture that is designed as a useful product.

- Components mixed carefully to get the required **properties**.

Examples of formulations:
- Fuels
- Cleaning agents
- Paints
- Medicines
- Alloys
- Fertilisers
- Food

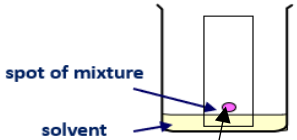


Chromatography

- Technique used to separate mixtures of **soluble substances**.
- How soluble a substance is determines how far it travels across paper.

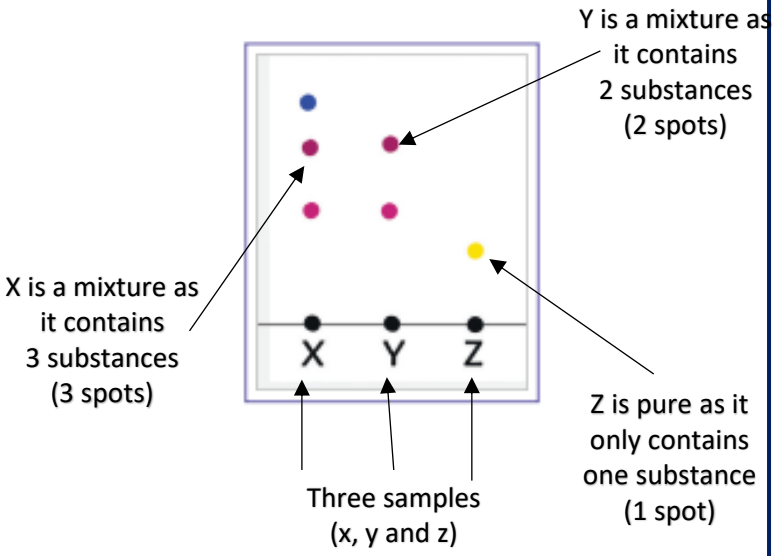
More soluble = travels further (higher up paper)

Mobile phase
- **Solvent** is the mobile phase
- The substances dissolve in the solvent
- The solvent then moves through the stationary phase.



Stationary phase
- Does not move. The paper is the stationary phase.

Important – start line on paper must be drawn in **pencil** as pencil is **insoluble** and **will not run**
The spot and start line must be **above the solvent line** so the colours won't just wash into the solvent in the beaker.



Rf Values

This is the ratio of the distance moved by a substance to the distance moved by the compound

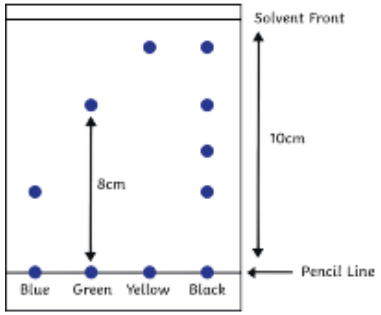
$$R_f = \frac{\text{distance travelled by substance}}{\text{distance travelled by solvent}}$$

- Should always be between 0 and 1.

- Each substance has a unique Rf value.

- Can compare Rf values to a library of known substances

- Can identify unknown substances.



Rf value of green:

8cm / 10cm = 0.8

C8 – Chemical Analysis

1. What is a pure substance?

2. How can you test that a substance is pure?

1. What is a formulation?

2. Give 3 examples of formulations.

1. What is chromatography used for?

2. What determines how far the substance travels?

3. What is the mobile phase in paper chromatography?

4. What is the stationary phase in paper chromatography?

5. How would you be able to identify a pure substance on a chromatogram?

6. Draw and label a diagram of the experiment to Investigate how many different colours there are in food colouring using paper chromatography.

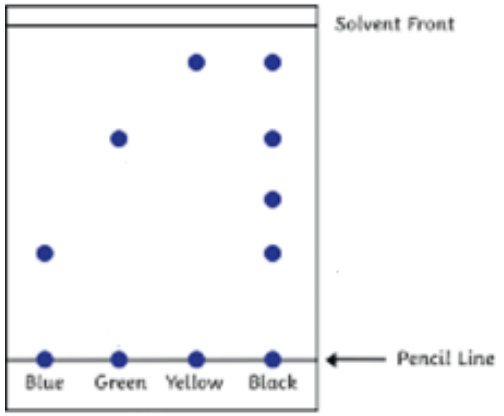
1. How do you calculate the Rf value?

2. Rf values should always be between…

3. Use a ruler to measure the distance the solvent moved in the diagram below.

4. Use a ruler to measure how far the yellow spot moved

5. Calculate the Rf value for yellow



C8 – Chemical Analysis

Required Practical – Paper Chromatography

Aim: Investigate how paper chromatography can be used to separate and distinguish between coloured substances.

Method

1) Using a ruler, measure 1cm from bottom of chromatography paper and draw a line across the paper with a **pencil**.

2) Using a pipette, drop small spots of each ink onto pencil line (leave a gap so do not merge).

3) Pour solvent into a beaker, do not fill solvent above the pencil line on the paper.

4) Place chromatograph paper into beaker and allow solvent to move up the paper.

5) Remove paper just before solvent reaches top of the paper and leave to dry.

6) Calculate R_f values of all the spots using the equation below:

$$R_f = \frac{\text{distance travelled by substance}}{\text{distance travelled by solvent}}$$

Common questions

Q1) Why is a pencil used instead of a pen?
A1) Ink in the pen would move up the paper with the substances.

Q2) Why do you not fill the solvent above the line?
A2) Substances would wash off into the solvent instead of rising up the paper

Q3) Why might water not work as a solvent?
A3) Some substances are **insoluble** in water.

Identification of the Common Gases

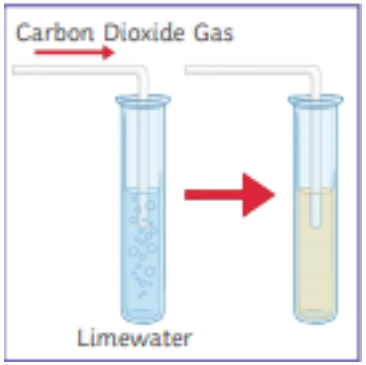
Test for hydrogen – Place a **burning** splint at the opening of a test tube. If hydrogen gas is present, it will burn with a **squeaky-pop sound.**





Test for Oxygen – Place a **glowing** splint inside a test tube. The splint will **relight** in the presence of oxygen.

Test for Carbon Dioxide –Bubble the gas through the lime water – if the gas is carbon dioxide, the limewater turns **cloudy**.





Test for Chlorine – **Damp litmus paper** is held over the
If the tube contains chlorine, the litmus paper
ıes **bleached** and **turns white**.

C8 – Chemical Analysis

1. Describe how you would carry out paper chromatography to separate and identify the different colours in food dye.

2. Why is a pencil used instead of a pen?

3. Why do you not fill the solvent above the pencil line?

4. Why might water not work as a solvent?

1. Describe the tests and the positive results for:

a) Hydrogen

b) Carbon dioxide

c) Oxygen

d) Chlorine

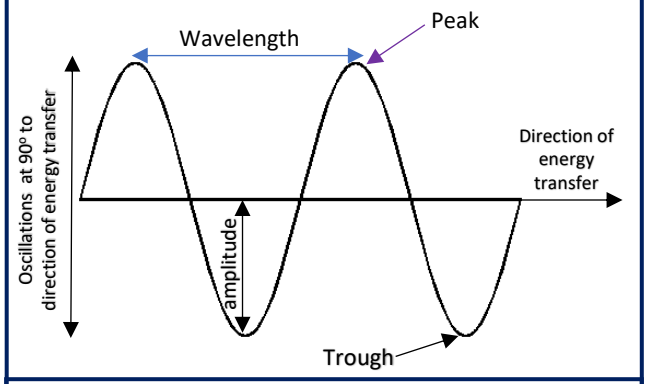
P6 – Waves

Transverse Waves

- Oscillations (vibrations) **perpendicular** to direction of energy transfer.

Examples:

- Electromagnetic waves
- Ripples on water.

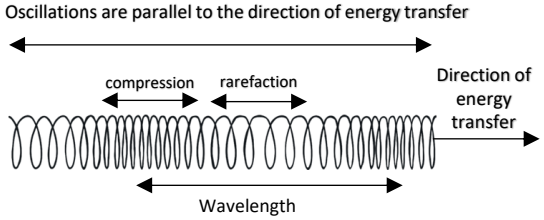


Longitudinal Waves

- Oscillations (vibrations) are **parallel** to direction of energy transfer.

Examples:

- Sound waves



Sound waves have areas of compression and rarefaction.

Compression = particles pushed closer together

Rarefaction = particles are further apart

Properties of Waves

Amplitude – maximum displacement from undisturbed position.

Wavelength – distance from a point on one wave to the equivalent point on the next wave.

Frequency – number of waves passing a point each second.
Frequency is measured in Hertz (Hz)
1Hz = 1 wave per second.

Wave speed – the speed at which energy is transferred through a medium.

You need to memorise

$$v = f \times \lambda$$

wave speed (m/s) | frequency (Hz) | wavelength (m)

Measuring speed of sound waves in air

- Stand 50m from a large flat wall.

- One person claps/bangs bricks

- Measure time taken to hear the echo.

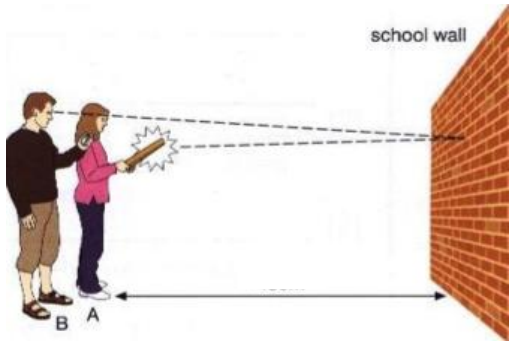
- Calculate speed of sound using:

Speed = distance x time

- Remember distance is double (in this case, 100m) as it travels to the wall and back.

- Take several measurements and calculate the mean to reduce error.

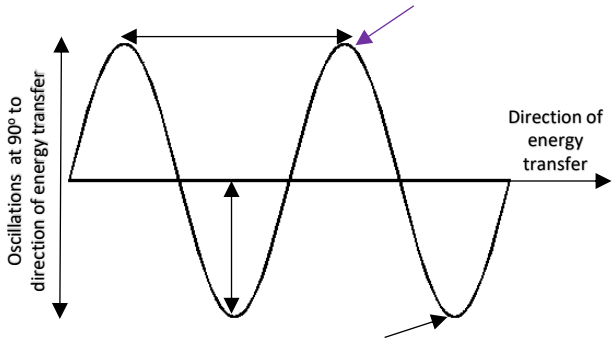
This is unlikely to produce an accurate value for sound in air (330 m/s) as the reaction time of the person operating the stopwatch is likely to be a significant proportion of the time measurement.



P6 – Waves

1. How are transverse waves produced?

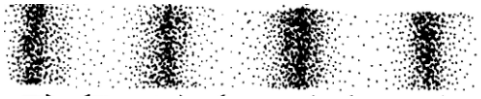
2. Label the wave features below.



1. Describe a longitudinal wave

2. Give an example of a longitudinal wave.

3. Label an area of compression and rarefaction in the diagram below



1. Define the following:

Amplitude

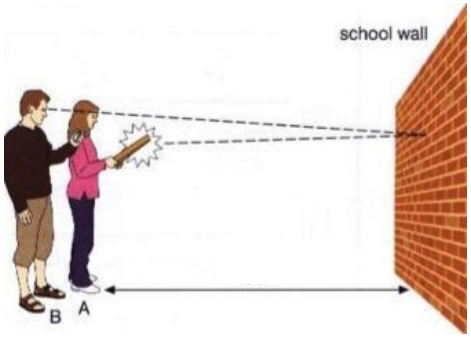
Wavelength

Frequency

2. What are the units for frequency?

3. What is the equation linking frequency, speed and wavelength?

1. Describe a method to investigate the speed of sound waves in air.

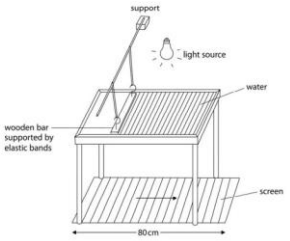


2. What is the biggest source of error in this investigation?

3. What is the speed of sound in air?

P6 – Waves – Required Practical – investigating wave in a solid and a ripple tank

Measuring waves in a liquid



Equipment

- Ripple tank
- Measuring ruler
- Stop watch

Method

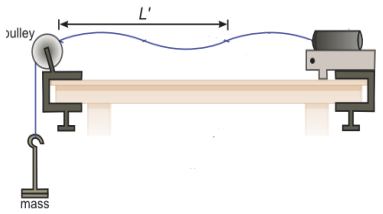
1. Set up the equipment as shown and turn on the motor to produce low frequency waves so that they are able to be counted.
2. Adjust the lamp until pattern is seen clearly on white screen underneath
3. Use a ruler to measure the length of a number of waves (e.g 10) and divide the length by the number of waves to give wavelength. This improves the accuracy of the measurement.
4. Record the waves using a camera or mobile phone. Count the number of waves passing a point in 10 seconds using a stopwatch and slowing the recording down.
5. Divide the number of waves counted by the time to give frequency.
6. Use $v = f \times \lambda$ to calculate the wave speed. Repeat for different frequencies of the motor.

Exp	Length of 10 waves (cm)	Wavelength of 1 wave (cm)	Number of waves in 10 s	Frequency (Hz)	Speed (cm/s)
1	65	0.65	121	12.1	7.9
2	50	0.5	155	15.5	7.9
3	42	0.42	187	18.7	7.9

Measuring waves in a solid

Equipment

- string, vibration generator, hanging mass set and pulley



Method

1. Set up the equipment as shown.
2. Turn on the vibration generator
3. Adjust the length of the string until a standing wave is achieved
4. The frequency can be read from the vibration generator
5. Measure as many complete waves as possible using a ruler
6. Divide the length by the number of waves to give wavelength
7. Calculate speed using $v = f \times \lambda$

Conclusion:

In both experiments, when you increase the frequency, the wavelength decreases – the speed remains the same in the same medium

P6 – Waves – Required Practical – Ripple Tank

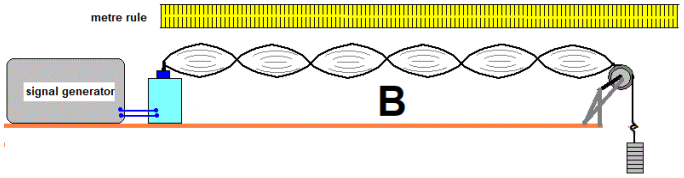
1. Complete the table below to explain the method in calculating the speed of waves in a ripple tank.

Step	Reason
Fill the ripple tank with water, switch on a lamp and place white card underneath the tank.	
Switch on the motor and adjust it to give low frequency waves	
Place a stopwatch next to the card and record the waves, with the stopwatch in view for 10 seconds	
Play the recording in slow motion, count the number of waves passing a certain point and divide this by 10	
Measure the length of 10 waves by taking a picture of the card with a ruler on it.	
Divide the length by 10	

2. If the length of 10 waves is 55cm, what is the wavelength of 1 wave?

3. If there are 210 waves in 10 seconds, what is the frequency?

1. When investigating waves produced by a vibration generator on a string, how do we know the frequency?



2. How many complete waves are shown in the image above?

3. If the length from the generator to the pulley was measured at 66 cm, what is the wavelength?

4. Why is it better to measure multiple waves and divide to find wavelength rather than measure one single wave?

5. What happens to wavelength when frequency increases?

6. What happens to wavelength when frequency decreases?

P6 – Waves

The Electromagnetic Spectrum

- All **transverse waves**
- Transfer energy from the source of waves to an absorber.
- All travel at the same **velocity** through a vacuum or air – **speed of light**.
- Speed of light = 300,000,000 m/s

You must remember all the electromagnetic waves in order!

Long wavelength → Short wavelength

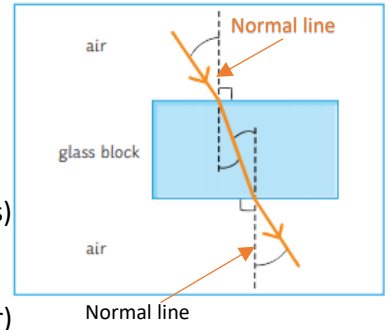
Radio waves	Microwaves	Infrared	Visible light	Ultraviolet	X-rays	Gamma rays

Low frequency → High frequency

Wave	Use	Other information
Radio waves	Television and radio	Easily transmitted through the air. Harmless if absorbed by the body.
Microwaves	Satellite communications and cooking food	Can be harmful when internal body cells become heated by over exposure.
Infrared	Electrical heaters, cooking food and infrared cameras	Can cause burns to skin
Visible light	Fibre optic communications	Only EM wave detectable by human eye.
Ultraviolet	Energy efficient lamps, sun tanning	Causes skin tanning and can lead to burns or **skin cancer**.
X-rays	Medical imaging and airport security scanners.	Very little energy is absorbed by body tissues. Passes through the body. They can lead to gene mutation and cancer.
Gamma rays	Sterilising medical equipment or food and treatment for some cancers.	

Ray diagrams

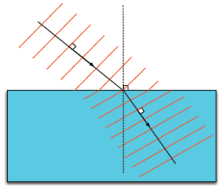
- You need to construct **ray diagrams** to show how a wave is **refracted** at the boundary of a different medium.



Less dense → More dense (e.g. air to glass)
- Ray **slows down** and bends **towards the normal** line.

More dense → Less dense (e.g. glass to air)
- Ray **speeds up** and bends **away from the normal** line.

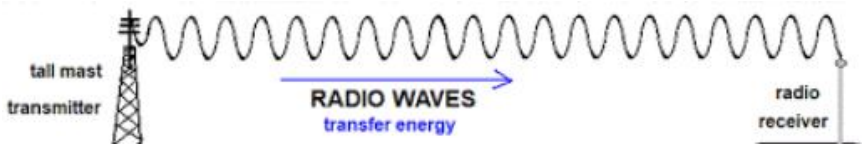
The ray bends because different parts of the wavefront cross the boundary at slightly different times –



If wave hits medium at an angle of 90° then the ray will slow down but will not be refracted.

Radio waves (HT only)

- Radio waves can be produced by **oscillations** in **electrical circuits**.
- Those radio waves can travel for long distances to receivers.
  - When absorbed by the receiver, the radio wave creates an **alternating current** with same **frequency** as the wave itself.
  - This is how TV and radio are broadcast.



P6 – Waves

1. State two properties of electromagnetic waves.

2. Write the EM spectrum in order of **increasing** wavelength

3. Write the EM spectrum in order of **increasing** frequency

4. How fast do electromagnetic waves travel?

5. State the uses of:

a) radio waves

b) microwaves

c) infrared

d) visible light

e) ultraviolet

f) x-rays

g) gamma rays

1. What happens when a ray goes from a less dense → more dense medium?

2. What happens when a ray moves from a more dense → less dense medium?

3. What is the line at 90^{o} to a surface called?

4. 4. What happens if a ray hits a medium at 90^{o}?

1. What type of current do radio waves create when absorbed?

2. What is the frequency of the current produced by a radio wave of frequency 250Hz?

P6 – Waves – Required Practical – Infrared radiation

Aim

Investigate how the amount of infrared radiation **emitted** (given out) by a surface depends on the nature of that surface.

In this investigation you are finding out which type of surface emits the most infrared radiation:

- **Dark and matt**
- **Dark and shiny**
- **Light and matt**
- **Light and shiny**

Method

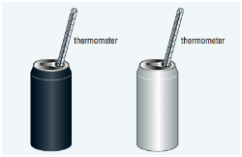
1. Place **Leslie cube** on a heat proof mat.
2. Once the kettle has boiled, fill the Leslie cube with water.
3. Hold the infrared thermometer 5cm from the first surface
4. Record the temperature
5. Repeat the experiment three times on each surface and calculate mean for each surface.

Independent variable: surface
Dependent variable: temperature of the air (infrared radiation emitted)
Control variables: Temperature of the water inside, the distance between the cube surface ad the infrared thermometer





In this investigation you are finding out which type of surface absorbs the most infrared radiation:





Method

1. Fill a black and a silver can with water from the tap.
2. Take the temperature of the water in each can
3. Place the infrared thermometer 5cm from the cans
4. Leave for at least 10 minutes
5. Record the temperature of the water in each can and calculate the rise in temperature

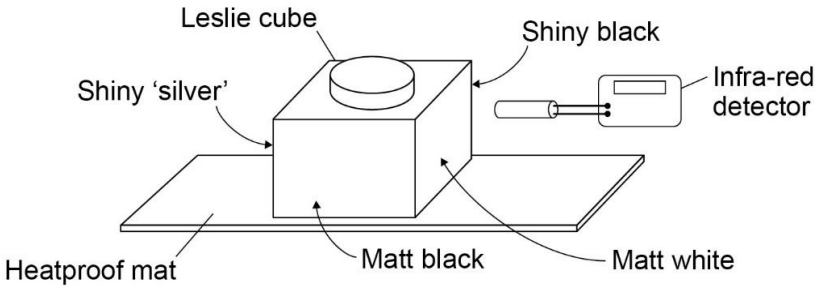
Independent variable: surface of the can
Dependent variable: Temperature increase of the water (infrared radiation absorbed)
Control variables: Temperature of the water inside, the distance between the cube surface ad the infrared thermometer

Conclusion

Black matt surfaces absorb and emit the most infrared radiation.
White/silver and shiny surfaces are poor emitters and poor absorbers of infrared radiation

P6 – Waves – Required Practical – Infrared radiation

1. Describe how you could use the equipment below to investigate the emission of infrared by different surfaces.



1. A student was investigating the amount of infrared radiation absorbed by water in cans with different surfaces.





Name the…
Independent variable:

Dependent variable :

Control variables :

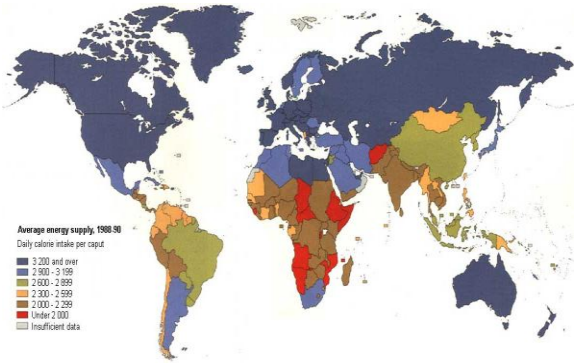
2. What kind of surfaces are the best emitters of infrared radiation?

3. Why does the water in the silver can heat up less than the black can?

The significance of food, water and energy to economic and social well-being.

Everybody needs food, water and energy Resources, such as food, water and energy are needed for **basic human development**. People need food and water to **survive** and stay healthy. **Energy** is needed for a **basic standard of living**. Access to **food, water and energy** affects the **social well-being** of people and countries.

Food:

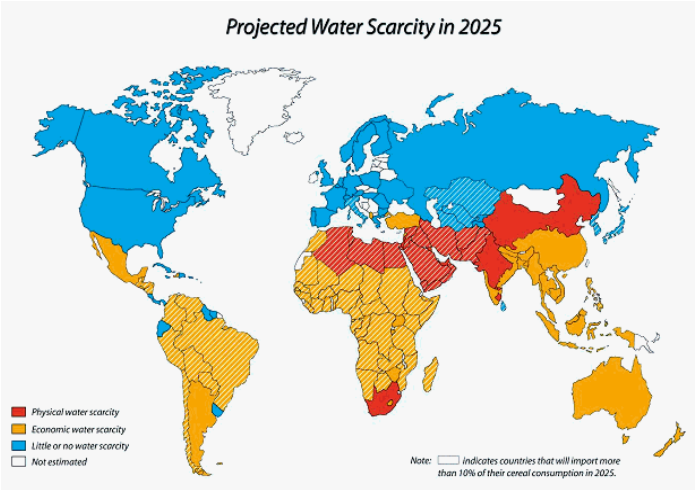


Map showing daily calorie intake world wide

1.As can be seen from the map, the daily calorie intake is **uneven** across the world. With many **LIC countries** having a very **low calorie intake**. Especially the Sub Saharan African countries.
2.Without access to enough safe, nutritious food people can become **malnourished** – which means to not have the right balance of nutrients in their diet, this can affect a child's development.
3.Malnourishment increases the likelihood of getting **diseases** – one third of all children under the age of 5 that die globally due to diseases linked to malnourishment.
4.People who may not get enough to eat will **not preform** as well in **school** or at **work**. Meaning the population will **lack** the **skills** needed to help a country's economic development.
5.Overall a lack of food will have a **negative impact on social well** being of people. It may lead to social unrest and **civil war**, it leads to **health problems**, and forces people to **migrate** from their homes.
6.It can also have a **negative** impact on the **economic well-being** of the people, as people can't work if they have no food, children can not attend school as they must either try to farm the land or find food. This **stops the country from developing**.

Water

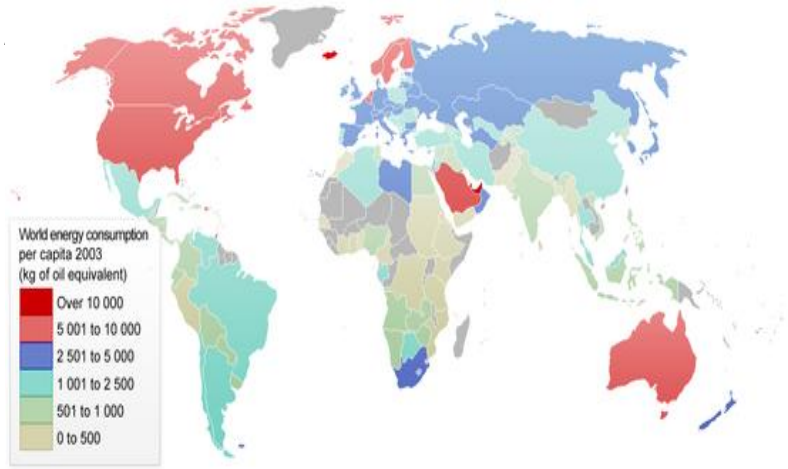
A map showing projected water scarcity



1.As can be seen from the map, water availability is **uneven** across the globe. Many north African countries may not have physical access to water by 2025.
2.Water is needed for **drinking, cleaning and cooking**.
3.Without sanitation, water sources can also become **polluted** e.g. by raw sewage
4.Water borne diseases like **cholera and typhoid** kill millions of people each year.
5.A lack of water impacts the **social well being** in countries as **diseases and death** are common. Civil war can also take hold. It can lead to a lack of food and starvation.
6.It can also have a **negative** impact on the **economic well being**, as people spend all day **searching for water** meaning they can not work or attend school. This stops the country from developing.

The significance of food, water and energy to economic and social well-being.

Everybody needs food, water and energy Resources, such as food, water and energy are needed for **basic human development**. People need food and water to **survive** and stay healthy. **Energy** is needed for a **basic standard of living**. Access to **food, water and energy** affects the **social well-being** of people and countries.



Energy

1.The map shows that energy consumption is **uneven** globally, with the **highest rates** of consumption generally taking place in the **HICs.**
2.Energy is important for **industry, transport and homes**.
3.Social well being will be **negatively impacted without** energy as people will not be able to heat homes, or turn lights on during the night. Social unrest/ civil war can take place over the availability of resources
4.The **economic well being** in the country can be **negatively impacted**, as industries can not operate, meaning there are few jobs, which could help the country develop. Furthermore, people can not travel to jobs in other places, as the lack of energy makes travelling difficult.

An overview of global inequalities in the supply and consumption of resources.

1.The global distribution of resources is uneven
2.Some countries do not have energy reserves, others have **poor climates** meaning food production is difficult.
3.For some countries the only way to access these resources is to **import** them, which is **expensive**.
4.Consumption of resources therefore **depends on wealth** and their **availability.**
5.HIC's can afford to buy more resources, so consumption is greater to sustain their higher standards of living and social well being.
6.In NEE's like China consumption is growing quickly. Industry is developing very fast, which requires lots of energy) and population and wealth is also increasing rapidly
7.However, in **LICs** they **can not afford** to **exploit** their resources or **import** from other countries, so consumption is low.

Key word:

•**Consumption: the action of using up a resource**

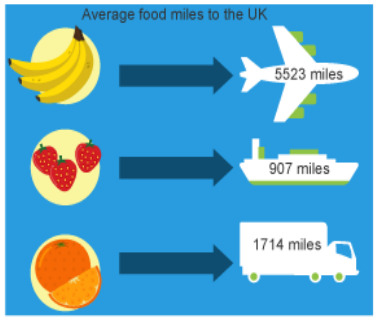
An overview of resources in relation to the UK: Food

Seasonal foods are now available all year round

1.The type of food that are in demand in the UK has changed. Before the **1960's** most fruit and veg sold in the UK was grown **locally**. **Seasonal foods** could **not be purchased all year round**, such as strawberries or Brussel sprouts. Seasonal foods are not available all year round, you can only buy it during the months it growth. This has now changed.
2.There has been a growing demand for **seasonal produce** to be supplied **all year round**. So now we import things like strawberries from Mexico and Apples from South Africa.
3.Demand has grown for high value foods like **exotic fruits**, vegetables and spices. Theses high value foods have become more popular in the UK as people's incomes have increased. These are often grown in **LICs** and **imported** to the UK.
4.There has been a **growing demand for organic food**. These are grown without the use of artificial fertilisers and the production of organic produce **does not have a negative impact** on the environment. Some organic food is produced in the UK, but lots is imported too.

The problems associated with our food – the carbon footprint!

1.The **growing, processing and packaging** of our food produces **C02** and other greenhouse gases. In 2013 9% of the UK's greenhouse emission came from growing food.
2.Transporting food from where it is grown to where it will be sold produces **C02**. This movement is called **'food miles.'**
3.The **amount of greenhouse gas** produced during growing, packaging and transporting is called it's **carbon foot print**. A larger carbon footprint means more greenhouse gases and more global warming.
4.Imported foods have to be transported along way, so have **high food miles** and a **large carbon footprint**.
5.Environmentalists are encouraging people to **buy locally** grown food. **Farmers markets**, farm shops and locally produced vegetable boxes are becoming more popular – reducing the carbon footprint of the food we eat.



Farming is becoming more industrialised

1.Since the 1960's there has been a growth in **large scale industrial farming** where processes from the production of seeds and fertilisers, to the processing and packaging of food is controlled by large firms, known as **agribusiness**.
2.This has caused **farm sizes** to **increase**. Small farms have been taken over and **field sizes made bigger**, so more can be produced.
3.The use of **chemicals** has increased – large amounts of **artificial fertilisers** and **pesticides** are added to crops to help them grow.
and special feed to animals to encourage growth
4. The number of **workers has fallen**, as **modern technology** is capable of doing the work.
5. Industrial farming has had **negative environmental impacts**, including **hedgerow destruction** (loss of habitats), increased **soil erosion**, and **fertilisers** running into streams and ponds, causing algae to grow and the fish life to die.

An overview of resources in relation to the UK: Water

Demand for water across the UK

1.In the UK the places with the **best supply** of water are **not** the areas with the **greatest demand.**
2.The **highest demand** for water in the UK is in the **South East**, where the population is growing and there is little rainfall. The **highest** amount of **rainfall** is in the **north west,** where the population is actually declining.
3.The **south east** is an area of **water deficit** (there is a greater demand than can be supplied).
4.The **north and west** are areas of **water surplus** (there is a greater supply than demand).
5.The amount of **water used** in the UK has **increased by 70%** since 1975. Mainly due to new appliances like washing machines and dishwashers
6.The **UK's population** has also **increased by 10 million**, meaning more users.
7.The south east continues to grow, even though water supply is low. This is due to the north south divide.
8.Demand is increasing because of Increased population, more crops required , Technology has changed (washing machines etc), power showers, central heating

The problems of polluted water in the UK

1.Polluted or **low quality water** reduces the amount available for use
2.The quality of water in the UK has been **improving**. However there are **still problems**, such as **nitrates** from fertilisers being **washed into rivers** and soaked into groundwater. Also, **pollutants from vehicles** being washed into water sources through run-off when it rains.
3.80% of water in southern parts of the UK comes from **groundwater**. However, **pollution** is affecting about **50%** of this. Many groundwater supplies have been closed, or expensive treatment of them has taken place.
4.Strategies used to improve water supply include, putting **stricter regulations** on how much **fertilisers** and pesticides can be used. Also, **higher taxes** have been introduced on the **most polluting cars**. This encourages people to but newer, greener models.

Water transfer can help to maintain supplies

One way to **deal water deficit** issues, is to **transfer water** from areas of surplus to deficit. Water Transfer schemes meet the demand for water by **transferring water from areas of water surplus** (low population, high rainfall) to **areas of water of deficit** (high population, low rainfall and high industry). Its first creates a reservoir in an area of water surplus and holds it. This water is then transferred to areas of water deficit.
However, water transfer can cause problems: Dams can be **expensive** to build and the reservoirs lead to huge areas being flooded, damaging farm land, habitats and causing people to be relocated. **Political issues** can exist e.g. people may not want their water transferred to another area.

Conserving water is also being used to lower the demand. The UK is trying to conserve water by: fixing leaking pipes, teaching children in schools about not wasting water i.e turning off taps while brushing your teeth, Using technology, duel flushing systems on toilets or collecting and using rain and grey water, Banning the use of hose pipes during times of water stress

An overview of resources in relation to the UK: Energy

The UK's energy mix is changing – renewables!

1.Traditionally the UK relied on **fossil fuels** (coal, oil and gas) to supply it's energy. In **1970**, 91% of our energy came from oil or coal.
2.The discovery of large **gas** reserves under the **North Sea** meant that by **1980**, 22% of the UK's energy was supplied by gas.
3.The use of **nuclear energy** to produce electricity also **increased** during the **1990's.**
4.Recently there has been a movement towards using **renewable energy supplies**, rather than fossil fuels. All coal fired power stations in the UK are due to close by 2025. In **2014**, **19%** of all electricity produced in the UK was generated by **renewable energy**.
5.Wind and bioenergy (energy from the burning of biological source e.g. food waste or oil rape seed) are the **biggest sources** of renewable energy, but the use of solar and hydroelectric power have also increased.

The UK's supplies of coal, oil and gas are running out

1.North Sea oil and gas reserves are rapidly **running out**.
2.The UK still has **coal reserves**, but the **use** of coal has declined rapidly since the 1950's. This **decline** has happened as we have tried to **reduce C02** emissions and the cost of **mining** these reserves is very **expensive**. The last deep coal mine closed in the UK in December 2015..
3.The use of **shale gas** from underground in the UK is being considered. This is extracted using a process known as **fracking**: fluid is pumped into shale rock at high pressure, causing it to crack. This forces gas trapped in the rock to flow back out of a well, where it is collected. Much of the fracking in the UK would take place in the **North West** of the country, this has the potential to create **thousands of jobs** in an area of economic decline. Aberdeen is one of the most wealthiest places in the UK and this is linked directly to job creation and **taxes** from offshore oil and gas.

Exploiting energy sources causes economic and environmental issues.

Energy resources are very important for the UK , exploiting these **creates jobs** and **wealth** for areas of the UK. However this extraction can cause problems:

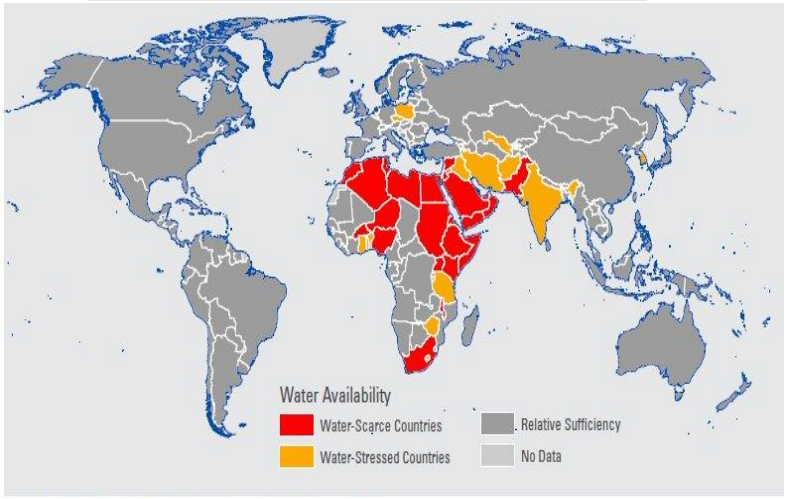
Economic issues:
1.The cost of extracting fossil fuels can be expensive. As the reserves run out extraction becomes more difficult and costs increase further.
2.North Sea oil is especially expensive to extract. If the price of oil drops (as it did between 2010-2013), it may cost more to produce than to sell. This could lead to job loses.
3.The cost of producing energy from renewables and nuclear is very high. This cost is often passed on to the consumer,
4.Money is needed to continue to research into alternative energy sources such as fracking, or building new nuclear power plants
5.Renewable energy can be unreliable and inefficient. This means the UK still has to pay high prices to import energy from other countries.
6.Nuclear waste is expensive to dispose of as it is highly dangerous. This pushes up the cost of producing electricity.

Environmental Issues
1.The burring of **fossil fuels** produces **C02** and greenhouse gases, this is causing the greenhouse effect.
2.Fracking may **pollute groundwater** and cause **mini-earthquakes** – this has led to some people campaigning to ban it.
3.Large areas of land are needed to produce energy, this can **destroy habitats** and create a **scar on the landscape** (lowering house prices).
4.Accidents such as **oil spills** or **nuclear disasters**, can leak toxic chemicals into water sources, soils and the atmosphere, **killing animals** and posing a significant **risk to human health.**
5.Natural ecosystems can be damaged by **renewable energies**, like large wind farms, which **create noise** and **scare wildlife**. They can also ruin the landscape of coastal and countryside areas, putting tourists off visiting.

WATER: Areas of surplus (security) and deficit (insecurity):• global patterns of water surplus and deficit • reasons for increasing water consumption: economic development, rising population • factors affecting water availability: climate, geology, pollution of supply, over-abstraction, limited infrastructure, poverty.

Global patters of water surplus and deficit

Water security – area with high rainfall and or very low population density e.g. Canada and Brazil



Source: Population Action International (PAI). *Mapping Population and Climate Change*. Washington, DC: PAI.

Water insecurity – areas with low rainfall and or very high population density e.g. Libya, Mexico

Global demand for water: Water insecurity is not having enough clean water

- **Water security** means having a reliable and sustainable **source** of enough **good quality water** to **meet** everyone's **needs** – for industry, agriculture and personal health.
- Water security depends on the amount of **water available** (e.g. from rainfall, rivers, groundwater etc.) and the **number of people** that need to use that water. It also depends on being able to **access** that water which can be hard if you are poor.
- Having **more water** than is needed is known as **water surplus**. When there is **not enough water** to meet everyone's needs it's called a **water deficit.**
- A **water deficit** can lead to **water insecurity** – when there is not enough clean water to keep everyone healthy, or enable them to make a living (e.g. to water their crops, provide energy etc.)
- When **demand** for water is **greater than** the **supply** during a certain period, or when water is not of high enough quality to use, places are said to experience **water stress.**

WATER: Areas of surplus (security) and deficit (insecurity):• global patterns of water surplus and deficit • reasons for increasing water consumption: economic development, rising population • factors affecting water availability: climate, geology, pollution of supply, over-abstraction, limited infrastructure, poverty.

Water demand is rising as there are more people with more money:

Rising population

- The world population is increasing. Each person needs water for drinking, washing, preparing food etc.
- More people also means that **more food** needs to be grown – **irrigation for agriculture** uses **70%** of the world's **freshwater resources.**

Economic development

- Countries are becoming **more industrialised** as they develop. This means they are producing more goods. **Manufacturing** uses a **lot** of **water**.
- Energy production – **15%** of all **water** withdrawn globally is used to **produce energy**, e.g. cooling in thermal power plants.
- **Rising living standards** – as countries develop, people's wealth increases and they can afford a higher standard of living. This **increases water use** as more people use **flushing toilets, showers, dishwashers** etc.

Factors affecting water insecurity:

Physical factors:	• **Climate** – most places rely on rainfall, which feeds lakes and rivers, for their water supply. If **climates** are **hot**, lots of water is lost from lakes and rivers due to **evaporation**. • **Climate change** is altering the total amount of rainfall in places, as well as how often it rains and how heavy it is. Many dry **areas** are **getting drier**, increasing the risk of droughts. • **Geology** – when rain falls on **impermeable rock** e.g. clay, it can't soak in, so **flows off** into rivers and lakes. These are easy to get water from. However, when rain falls on **permeable rock** e.g. sandstone, it **infiltrates** through them and forms underground **water stores** aquifers), which are harder to get to. However groundwater can make water available in very dry places e.g. the Sahara desert.
Economic and social factors	• **Over extraction** can take place, when **more water** is being **used** than is being **replaced**. This can be caused by **population growth** (which is common along the area of the Sahel – on the edge of the Sahara desert). Another cause can be **improvements in sanitation** and **personal hygiene** e.g. people take **more showers**. Finally, tourism and **recreation** can increase water stress, for example watering golf courses in dry areas – in Spain one **golf course** of the summer season uses as much water as a town with a population size of 20,000 in the UK. • The **pollution of water** from rapid industrial development, means **less** water is **available** for drinking. • **Human** and **animal waste** are a hazard where people share water sources with animals and do have access to sanitation. • **Limited infrastructure** – rapid urbanisation means that water pipes and sewers can not be built quickly enough. This means **sewage contaminates** the **supply.** • **Poverty** – water providers charge a fee for supplying water. People who are **too poor** to **pay** for the **mains supply** will look for other sources, which may not have been treated to make them safe.

Impacts of water insecurity – waterborne disease and water pollution, food production, industrial output, potential for conflict where demand exceeds supply.

- **Diseases** – where water is scarce, supplies of drinking water can become contaminated with sewage or industrial chemicals e.g. fertilisers. This can cause **cholera and typhoid**, leading to death.
- **Reduced food production** –A shortage of water means **less irrigation** can happen, therefore less crops produced which can lead to **starvation.**
- **Industrial** output can **decline** – Industries use huge amounts of water, when water is scarce it results in less being produced, causing **profits** and **wages** to **fall**, which is bad for the economy.
- It can cause **conflict** – When countries of water insecurity share the same water supplies e.g. a river or aquifer, water shortages can trigger conflicts. For example one country may decide to build a dam to trap more water, however this will mean the country further down stream will have less.

Overview of strategies to increase water supply: • diverting supplies and increasing storage, dams and reservoirs, water transfers and desalination

Water supplies can be increased

- Water is often not where it is needed. **Water diversion schemes** transfer water from areas of surplus to areas of deficit.
- **Seasonal variations** in rainfall can cause a water deficit at certain points during the year. One way to solve this is to **store water in tanks**, or in **reservoirs**. This gives a reliable source of water all year round.

Water transfer

- Water transfers are **large scale engineering** projects that move water from a river that has surplus water to a river that has a water shortage.
- The water is usually transferred in **canals** and **pipes**.
- Water transfer can **reduce** the **water deficit issue**, meaning farmers do not suffer crop failure and life can carry on as normal e.g. no hosepipe bans etc. In LICs this stops people being forced to drink dirty water.
- However, it can cause **social** and **economic problems**. For example, the cost of pipes can be **expensive** and this is **passed** on to the **consumer**, this means poorer people may struggle to buy the water. **Areas** where the water is being **transferred from** could end up in **drought**, during particularly dry periods. This causes **conflict** as local farmers may be angry that they can't grow crops as their water is being transferred.

Overview of strategies to increase water supply: • diverting supplies and increasing storage, dams and reservoirs, water transfers and desalination

Dams and Reservoirs

- Building a dam across a river **traps** a large amount **water** behind the dam, creating a **reservoir**.
- During times of **water surplus** the reservoir will fill. This is **stored** and can then be **released in times of water deficit**. Meaning there is a consistent flow of water all year round. This provides clean water for the population and allows crops to be grown.
- Water transfer from reservoirs is usually along **pipelines** and **pumping stations**. These are **expensive** to construct and maintain and push the price of water up for the local population.
- Most of **Birmingham's water comes from the Elan valley in mid-Wales**, where a series of dams and reservoirs provide a continuous supply for the city.
- Reservoirs cause **conflict** due to the huge area of **land** which is **flooded**. This destroys agricultural land, putting farmers out of business. It can drown settlements in the local area, meaning locals are forced to move, breaking up the community.

Desalination allows sea water to become a water source

1. Desalination is the **removal of salt from seawater** so that it can be used. There are **two ways** to do this. The first is to **heat** the seawater so it evaporates, the water is then condensed, this is collected and drinkable water has been achieved. The other method is to use a **special membrane** to remove the salt. This provides clean drinking water in areas of water deficit such as places like Dubai.
2. This is very **expensive** as the seawater must be **heated**, or enough **energy** is needed to push the water through the membrane. This means huge amounts of **fossil fuels** would be needed, **increasing C02 levels**. However, in Saudi Arabia, they are currently building the world's first large scale solar powered desalination plant.
3. In the **UK**, **desalination** is mainly used during **droughts**. For example, London has a desalination plant on the banks of the river Thames. It can supply enough water for 400,000 homes in times of water shortage.
4. Wealthy desert countries such as Dubai, mainly use desalination as their main source of clean, drinking water. In **Dubai 98.8% of the water comes from desalination** with one supply plant creating 140 million gallons of desalinated water each day. This means that huge amounts of energy are being used to produce this.
5. The plants being used across the Arab countries are quiet energy efficient, with the latest plant in Dubai being 82% efficient. However, it still has one of the **largest carbon footprints** in the world because of this. Also the amount of **salt in the sea is rising** rapidly as the water is taken out and the salt dumped back into the sea, this is threatening sea life in the area.
6. Dubai only has **4 days worth of back up supply of water at any time**, so if any problems were to arise at the desalination plants, the area would quickly run out of water.

An example of a large scale water transfer scheme to show how its development has both advantages and disadvantages.

China's south to north water diversion project – Large scale project

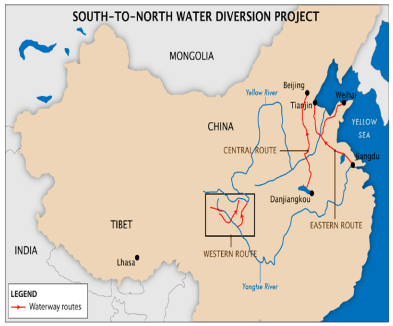
To cope with water insecurity, the Chinese government has planned a **$62 billion project** that will transfer **44.8 billion cubic litres of water** every year **from the south to the north** of the country. Two of the three planned routes have been completed – the Central and Eastern Routes.

Advantages of the project

1. It provides water for people in the north, in major cities such as Beijing and Tianjin. In total over **50 million people will benefit** from the project, as the will have clean, uncontaminated water.
2. **Industry** can continue to **develop** in these large cities and across northern China, bringing **taxes** and wealth to the country allowing it to develop.
3. It provides a reliable source of water to **irrigate farmland**, meaning crops can be grown and food shortages do not happen.

Disadvantages if the project

1. Huge areas of **land** had to be **flooded** to create the **reservoirs**, one of the largest was part of the 3 gorges dam project. This caused **habitats to be ruined** and animals such as the **yellowfin dolphin** to become extinct.
2. The creation of the **Danjiangkou Reservoir flooded farmland**, causing farmers to lose jobs, as well as forcing 345000 people to move, destroying the communities within the area.
3. The **water supplied** to Beijing is **very expensive** for consumers as the project cost so much. The project **only supplies urban areas** and those that can afford it – this means that the **urban poor** and those in **rural areas have not got access to this clean water source** so still have the same problems as the past.
4. **Water stress in the south** will increase as so much water is being diverted. During severe droughts, there won't be enough drinking water or irrigation water for over 30 million people. This could cause crop failure and force people to drink dirty water causing disease.



sketchmap only--exact data unknown
Current status:
Eastern route: extensive work has been done
Central route: work commenced in 2004
Western route: in planning and site preparation stages

Moving towards a sustainable resource future: an example of a local scheme in an LIC or NEE to increase sustainable supplies of water.

Kenya: Sand Dams

Kenya is a LIC, with a hot, dry climate. Most rain falls in just a few heavy downpours each year. Most rivers therefore only flow in the rainy season, as in the dry season the water evaporates. It is difficult for rural communities to storm water for future use. People in Kenya's Malaika near the town of Mitito Andei have been helped to build sand dams (African Sand Dam Foundation), which give them access to water all year round.

This is how:

1. A low dam (about 1 m high) is built across the river using locally found materials like rocks and cement
2. During the rainy season, when water is flowing in the river, coarse material like sand is trapped behind the dam.
3. Water gets trapped between the sand particles (about a third of what is trapped behind the dam is actually water)
4. Over many rainy seasons the sand builds up
5. The sand prevents the water from being evaporated by the hot sun during the dry season and filters the water
6. When the river stops flowing, water can be extracted from the sand by digging a well, piping the water through the dam to a tap or simply digging holes and scooping the water out
7. Eventually the water table also rises, which means that crops start to flourish in the area.
8. The dams are cheap to build, use local materials and don't require much maintenance
9. The height of the dam can be raised every year to trap more sand and water

Problems of the scheme:

1. Require the charity to supply the concrete and knowledge on how to build the dam
2. Require the charity to educate local people on drought resistant crops

Both of these depend on overseas aid donations from the public.

Moving towards a sustainable resource future: water conservation, groundwater management, recycling, 'grey' water

Water conservation:

1. Fixing **leaking reservoirs, pipes and dripping taps** helps to stop water being wasted. In the UK **3.3 billion litres** of water are lost every single day.
2. Fitting **dual flush toilets** reduces use, as they use less water. They save up to **3.5 litres** for every flush. Some urinals are also waterless now, such as in McDonalds, saving millions of litres of water per day.
3. More **efficient dishwashers and washing machines** are now used, and people are encouraged to only run these on full load.
4. Fitting homes and businesses with **water meters**, means people are more aware of the water which they are wasting/ using. This means they are more likely to reduce their use.
5. **Educating people** to take sorter showers and turn off taps when not in use (e.g. brushing teeth).
6. **Building adaptations such as green roofs,** these filter rain water and allow it into the main supply. Where it can be used for cleaning**.**
7. **Water butts** can be used to catch rainwater which would from the downpipe of gutters. This can be used to water the garden, flush toilets etc.

Recycling and 'Grey' Water:

1. Recycling water means to **take what has already been used and using it again**, rather than returning it to a river or the sea. This makes water use more sustainable because less water needs to be taken from rivers or groundwater.
2. Water from homes and industries can be pumped to **water treatment plants**, where it is cleaned and made safe to reuse.
3. The recycled water is used for **irrigation, industry, power plants and toilet flushing**. However, it can be treated enough to make it re-drinkable and the process is expensive and polluting.
4. **'Grey' water** is a type of recycled water. It is usually **used immediately** rather than being treated first. It is normally waste water from peoples homes, for example, from washing machines, showers or sinks. It does not include toilet water as this is contaminated.
5. Because it is quite clean it can be **used for irrigating gardens, farmland, washing cars and flushing toilets**. This can safe thousands of litres of water.
6. This also **conserves the energy** needed to treat the water, which can be expensive.
7. This is also good as it **reduces the use of clean water**, which can be saved for drinking.
8. However, a negative is grey water **can not be used as drinking water** as it is far too dirty.

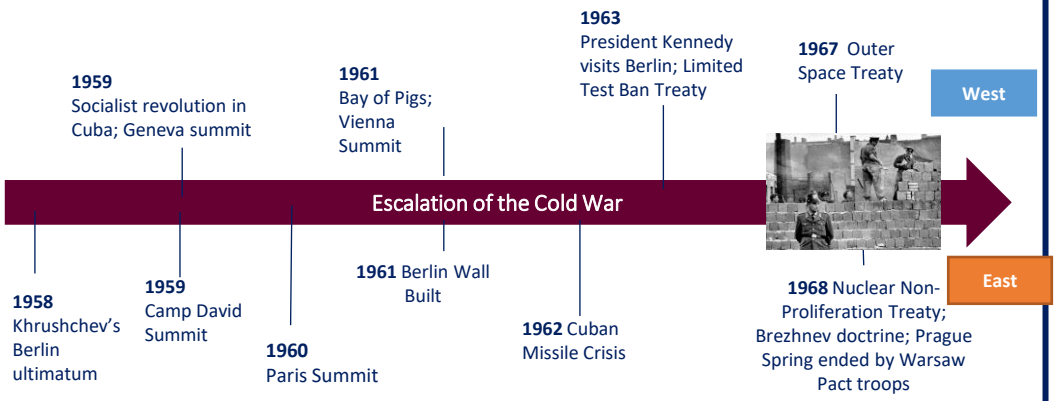
Ground water management:

1. **Monitoring groundwater extraction** means that you can ensure that extraction of the water is not faster than is naturally being replaced.
2. **Farmers** have been told to use **less artificial fertilisers and pesticides**, companies that leak toxic waste are fined. This stops the water supply becoming contaminated.
3. **International agreements** have been created where **groundwater** is **shared** between countries. This ensures that one country does not take an unsustainable amount of water leaving another country short. However, agreeing how much water each country can take from the aquifer can be very difficult.



Knowledge Organiser Paper 2, Section A: Superpower Relations and the Cold War, 1941-91

Enquiry 2: How did the Cold War escalate?



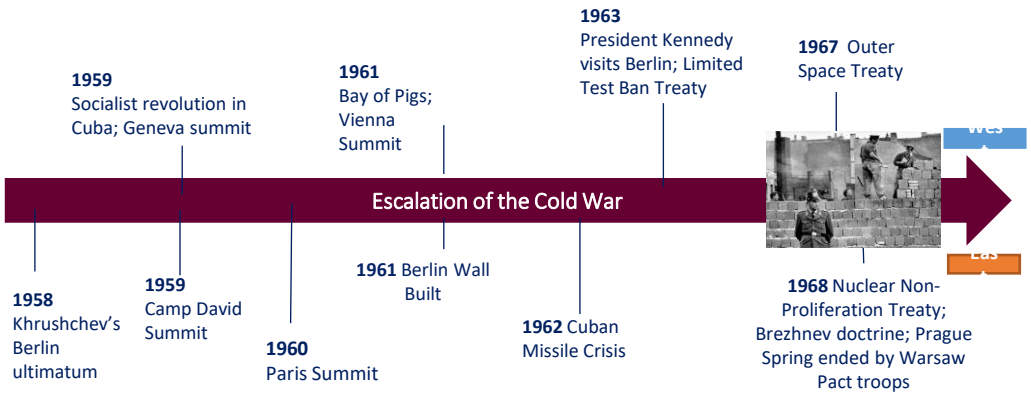
The events of the Hungarian Uprising made superpower relations more tense and the period between 1958 and 1970 represented the most difficult period of the Cold War. It was a period of crises – in Berlin, Cuba and Czechoslovakia.
Berlin had been a point of conflict since the wartime conferences and in 1961 a wall was built dividing East from West Germany at Khrushchev's order. Both sides now had nuclear weapons and were operating under the concept of mutually assured destruction. This meant that the superpowers could not allow tensions to boil over into war. When the Soviet Union placed nuclear launchpads in Cuba, tensions were raised to their highest point in the cold war, when for a moment, the superpowers seemed on the brink of nuclear confrontation. The Soviet invasion of Czechoslovakia in 1968 did little to reduce tensions as the new Soviet leader, Brezhnev, set out his doctrine that the Soviet Union would take action (likely military action) in any satellite state where communism was threatened.

Enquiry 2 Keywords:		
Berlin Wall A final demand backed up with a threat to take action	**CIA** Central Intelligence Agency. Part of American government in charge of spying	**Hotline** A direct communication line between the leaders of the superpowers
Blockade When a military force refuses to allow something past or they will open fire	**Doctrine** A belief or philosophy	**Non-proliferation** Stopping the building and spread of weapons
Brinkmanship Pushing disagreements to the point where there is a risk of war	**Doves** Advisors who wanted to avoid war	**Reform** Making changes in order to improve something
Censorship When a government prevents people from writing or saying things it disagrees with	**Hawks** Advisors who supported war	**Ultimatum** A final demand backed up with a threat to take action

Key people:	
Khrushchev	Replaced Stalin as leader of the Soviet Union in 1956. Introduced the policy of De-Stalinisation and said there should be peaceful co-operation.
Eisenhower	Was elected as president in 1952. He wanted to contain communism but was concerned about the threat of nuclear war so was willing to try to improve relations with the Soviet Union.
Kennedy	Was elected president in 1961.He dealt with the impact of the Berlin Wall and the high point of Cold War tensions: the Cuban Missile Crisis .
Brezhnev	Replaced Khrushchev in 1968 and believed it was necessary to protect all communist countries. After the Soviet invasion of Prague he introduced his Brezhnev Doctrine.
Dubcek	Became the head of the Czech government in 1968 and introduced a series of reforms which became known as the 'Prague Spring' aimed at bringing 'socialism with a human face' to the Czech people.

Knowledge Organiser Paper 2, Section A: Superpower Relations and the Cold War, 1941-91

Enquiry 2: How did the Cold War escalate?



The events of the Hungarian Uprising made superpower relations more tense because…

Enquiry 2 Keywords:		
Berlin Wall	**CIA**	**Hotline**
Blockade	**Doctrine**	**Non-proliferation**
Brinkmanship	**Doves**	**Reform**
Censorship	**Hawks**	**Ultimatum**

Key people:	
Khrushchev	
Eisenhower	
Kennedy	
Brezhnev	
Dubcek	

Knowledge Organiser Paper 2, Section A: Superpower Relations and the Cold War, 1941-91

Recap of unit 1- explain one consequence questions

Exam technique – Section A: Question 1 **Explain two consequences of…**	
Checklist:	
Do you have two different and specific consequences?	✓
Do you use key terms to demonstrate knowledge an understanding and to support your point?	
Are you specific in your analysis and avoiding vague sentences (e.g. 'this made tensions really bad.')?	
Are you using consequence keywords?	
Have you written a concise paragraph for each consequence that avoids irrelevant information (e.g. linking to indirect consequences)?	

Consequence 1:	Identify consequence
	Develop and explain consequence (using specific information)
	Link back to question
Consequence 2:	Identify consequence
	Develop and explain consequence (using specific information)
	Link back to question

Consequence keywords

Which led to
Which caused
Which changed
Consequently

Remember: Ensure each of your consequence occurred as a **direct** result of the action or event in question.

Have you mastered enquiry 1? Make sure you can answer the questions below:	
1.Which counties were members of the Grand Alliance?	11. What was the role of Comecon?
2. Who were the leaders of the Big Three?	12. Why did Truman think economic aid would contain Communism?
3. Which leader wanted to accept the Soviet Union as a superpower?	13. Which countries joined NATO?
4. How much was it agreed Germany would pay in reparations?	14. What was the military alliance in the east known as?
5. What years were the conferences at Tehran, Yalta and Potsdam?	15. What currency was being used in West Germany?
6. What was the aim of the policy of containment?	16. Which countries joined the Warsaw Pact?
7. When did the USA drop the atomic bomb?	17. In what year was West Germany created?
8. In what year did Hungary become a Communist one party state?	18. What did the USA launch in June 1957?
9. Can you name three satellite states?	19. Who was the leader of the Soviet Union during the Hungarian Uprising?
10. How much money did the US commit under the Marshall Plan?	20. Who was elected US President in 1952?

Knowledge Organiser Paper 2, Section A: Superpower Relations and the Cold War, 1941-91

Exam technique – Section A: Question 2 **Write a narrative account analysing the key events of…**	
Checklist:	✓
Do you have a minimum of three events to describe?	
Are your events in chronological order?	
Have you used specific details to explain each event?	
Have you made links between each events to explain how one led to another?	
Have you used linking language?	
Is there a clear beginning, middle and end structure?	

Step 1: Explain the first event ensuring you give precise details.

Step 2: : Now make a link between the first event and the second event.

Step 3 : Explain the second event ensuring you give precise details.

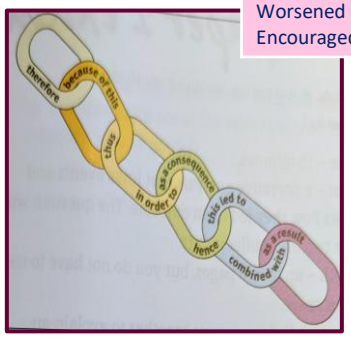
Step 4 : Now make a link between the second event and the third event.

Step 5: Explain the third event ensuring you give precise details.

Step 6: Conclude your answer by linking to the overall outcome of events.

Key analytical words:

Began
Developed
Changed
Ended
Intensified
Improved
Worsened
Encouraged



Have you mastered enquiry 2? Make sure you can answer the questions below:	
1.Why was Berlin divided?	11. How was Kennedy's reputation impacted by the Bay of Pigs?
2. Why was the Soviet Union worried about Berlin in the years 1958-61?	12. What did Khrushchev demand in a telegram to Kennedy on 26 October?
3. Which leaders attended the Vienna summit in 1961?	13. Which three agreements were made between the superpowers as a result of the Cuban Missile Crisis?
4. How may refuges had fled to West Germany by 1958?	14. What happened to Khrushchev as a result of the crisis?
5. When did the Berlin Wall begin construction?	15. Who became leader of the Soviet Union in 1968?
6. When did Fidel Castro gain power in Cuba?	16. Who was the leader of Czechoslovakia in 1968?
7. Why was Cuba important to the USA?	17. What was the Prague Spring?
8. What was the Bay of Pigs incident?	18. What happened on 20 August 1968?
9. Which government agency planned and carried out the Bay of Pigs invasion?	19. Which famous doctrine emerged as a result of the Prague Spring?
10. What did an American U-2 spy plane photograph on 14 October 1962?	20. What was the consequence of Soviet intervention in Czechoslovakia for other satellite states?

GCSE Unit 6 SPANISH Knowledge organiser.
Módulo 7 Topic Social Issues

What we are learning this term:

A. Talking about different ways of volunteering
B. Talking about charities and voluntary work
C. Talking about healthy eating
D. Talking about healthy and unhealthy lifestyles
E. Listening for different tenses

6 Key Words for this term

1. un voluntario/a	4. comedor social
2. ecologista	5. banco de alimentos
3. los sin techo	6. quiero

6.1G ¿Quieres ser voluntario/a?

arreglar	to tidy, to fix, to arrange
ayudar (a)	to help (to)
el banco de alimentos	food bank
charlar	to chat
el comedor social	soup kitchen
el concurso	competition
cultivar	to grow, cultivate
disfrutar	to enjoy
ecologista	environmental
la gente mayor	old people
hogar	home
limpiar	to clean
marcar (un gol)	to score (a goal)
necesitado	needed, required
los necesitados	the needy
la organización benéfica	charitable organisation, charity
participar (en)	to take part (in)
pasarlo bien	to have a good time
proteger	to protect
la residencia de ancianos	old people's home
los "sin techo"	the homeless
el Tercer Mundo	the Third World
la tienda con fines benéficos /tienda solidaria	charity shop
el/la voluntario/a	volunteer

6.1F Me gustaría ayudar

agradecer	to thank
aprender	to learn
el asombro	amazement, surprise
contar (que)	to tell, to relate
el curso	school year, course
los/las demás	the others, the rest
esperar	to wait for, to hope, to expect
formar parte	to be part (of)
hacer la cama	to make the bed
el centro de menores tutelados	children's home
el idioma	language
inútil	uselessel
propósito	aim, purpose, objective
repartir	to deliver, to hand out
tener sueño	to be sleepy
la tienda solidaria	charity shop
útil	useful

6.2G ¿Comes bien?

acostarse	to go to bed
las bebidas alcohólicas	alcoholic drinks
las bebidas azucaradas	sugary drinks
borracho/a	drunk
el dolor	pain, ache
emborracharse	to get drunk
evitar	to avoid
glotón	greedy
la grasa	fat
grasiento/a	fatty, greasy
intentar (+ infinitive)	to try to
el ladrón	thief, robber
malsano	unhealthy
musulmán	Muslim
poco sano	not healthy
la ración	portion
saludable	healthy
sano	healthy

Key Verbs

Ayudar To help	Ir To go	Soportar To stand	Hacer – to do/make	Limpiar To clean
Ayudo I help	Voy I go	Soporto I can stand	Hago I do	Limpio I clean
Ayudas You help	Vas You go	Soportas You can stand	Haces You do	Limpias You clean
Ayuda He/she helps	Va s/he goes	Soporta He/she can stand	Hace s/he does	Limpia He/she cleans
Ayudamos We help	Vamos They go	Soportamos W can stand	Hacemos We do	Limpiamos We clean
Ayudan They help	Van They go	Soportan They can stand	Hacen They do	Limpian They clean

6.1H La importancia de hacer obras benéficas

andar	to walk
el bolsillo	pocket
contribuir	to contribute
dar asco	to nauseate
el dibujo	drawing
donar	to donate
en vías de extinción	threatened (threatened with extinction)
escaso/a	scarce
la exposición	exhibition
el ganador	winner
ganar	to win
gastar	to spend
las instalaciones	facilities
el medio ambiente	environment
las obras benéficas	charity, charitable works
la pérdida	loss
perteneciente a	belonging to
el/la político/a	politician
los recursos	resources
seropositivo/a	HIV positive
el sida	AIDS
temer	to fear

6.2H ¿Qué opinas?

aguantar	to put up with, to bear
asqueroso/a	disgusting
ataque cardíaco	heart attack
aumentar	to increase
el botellón	drinking party in the street
cada vez más	more and more
el cerebro	brain
el consumo	consumption
el corazón	heart
cuanto antes	as soon as possible
el/la drogadicto/a	drug addict
la edad	age
la encuesta	survey
enfrentar	to face
grave	serious
hacer daño a	to injure, to harm
el hígado	liver
nocivo/a	harmful
participar (en)	to take part (in)
pedir	to ask (for), to ask (someone to do something)
los primeros auxilios	first aid
prohibir	to prohibit, to forbid
provocar	to cause, to provoke
el pulmón	lung
reducir	to reduce
síndrome de abstinencia	withdrawal symptoms
el sobrepeso	excess weight, obesity
subir	to go up
el tabaquismo	addiction to tobacco
la venta	sale

GCSE Unit 6 SPANISH Knowledge organiser. Topic Social Issues

Translation Practice. G – blue F – orange H - Green	
Trabajo _____ voluntario	I work **as** a volunteer
_____ comida a los clients	**I serve** food to the customers
Pienso _____ en el instituto	I'm thinking about **working** in the school
_____ ayudar a otra gente	**I hope** to help other people
_____ muchas horas el fin de semana	**I work** many hours on the weekend
Pienso que _____ a otra gente es muy importante	I think that **helping** other people is very important
_____ ser voluntario/a	**I'd like** to be a volunteer
_____ ayudar	**I would like** to help
Quisiera _____ las comidas	I'd like **to prepare** the meals
Me gustaría _____fondos	I'd like to **raise** funds
_____ en un hospital	**I used to help** in a hospital
_____ el trabajo un poco difícil	**I find** the work a little difficult
No _____ hacer nada	I don't **want** to do anything
_____ imposible hacer todo ese trabajo	**It would be** impossible to do all that work
¿Qué _____ tú?	What **would you do**?
_____ de estudiar por voluntar	**I stopped** studying to volunteer
A mi _____ le encanta voluntar	My **boyfriend** loves volunteering
No _____nada	I **wouldn't give** anything
No _____ el tiempo	I **wouldn't have** the time

Key Questions: Answer the following in your own words. Use these model answers	
¿llevas una vida sana? ¿Comes demasiada comida rápida?	Pienso que llevo una vida sana. Todos los días como un poco de fruta y bebo agua que es sano aunque de vez en cuando como las patatas fritas que son grasientas y malsanas. Solo como la comida rápida a menudo porque lo que no me gusta es la comida grasienta. No fumo y nunca voy a fumar. Es asqueroso pero mi padre fuma. Hago también mucho ejercicio. Ayer comí una ensalada que fue muy sana y hice ciclismo y deporte en colegio.
¿Cómo te mantienes en forma? ¿te acuestas tarde? ¿haces ejercicio?	Creo que como suficiente fruta y verdura porque como frutas y verduras todos los días. Mi fruta favorita es la manzana porque es dulce y fácil a comer, aunque como bastante comida rápida también. Ayer para la cena comí dos manzanas y un plátano. ¡Qué sano! Cuando tengo calor bebo mucha coca light con hielo sin embargo los gaseosas/las bebidas azucaradas no son muy sanas. Cuando tengo frio bebo chocolate caliente con mucha leche que es delicioso. Ayer bebí demasiado coca light Normalmente hago bastante ejercicio, que es muy sano. Todos los días voy a pie al colegio y los fines de semana hago ciclismo con mis amigos en el campo que es entretenido y bueno para el cuerpo/la salud. No me acuesto tarde durante la semana. Me acuesto a las diez pero los fines de semana me acuesto a los doce de la noche porque veo películas y videos de Youtube en mi móvil. Ayer me acosté a las once.
¿Qué comes para el desayuno, la cena, tu almuerzo? ¿es sano?	Para el desayuno, como normalmente los cereales que son deliciosos con zumo de naranja. Para la cena como normalmente carne con patatas y verduras con mi familia en casa que es un poco sano. Para mi almuerzo, como un bocadillo con jamón y queso en el colegio con agua o coca. Ayer desayuné … cené …comí para mi almuerzo …
¿Crees que es necesario llevar una vida sana/es necesario	Creo que es muy importante llevar una vida sana/Creo que es muy importante para los jóvenes llevar una vida sana. Es importante llevar una vida sana para ayudar tener un buen aspecto físico, para mantener una buena salud, porque ayuda con tus estudios

Key Grammar	
Forming the conditional ('would like to' tense). Always remove the –AR, -ER, -IR endings first	Remember the conditional ('would') tense endings for –AR, -ER, -IR verbs. They are: -AR, -ER, -IR: -ía, -ías, -ía, -íamos, -íais, -ían
Perfect Tense *('have done…')*	Formed with the verb '**haber**': he, has, ha, hemos, habéis, han + past participle: -ar: **-ado** -er/ir: **-ido** e.g. *He estudiado = I have studied*

GCSE Unit 7 SPANISH Knowledge organiser.
Topic Global Issues

What we are learning this term:

A. Talking about reusing things, reducing waste and recycling
B. Talking about ways of protecting the environment
C. Talking about poverty
D. Talking about homelessness

6 Key Words for this term

1. la libertad
2. pensamientos
3. asistir a
4. el destrozo
5. violento/a
6. la culpa

7.1G Reutilizar, reducir, reciclar

ahorrar	to save
la basura	rubbish
la bolsa de plástico	plastic bag
el cartón	cardboard
cerrar	to shut, to close,to turn off (tap)
el contenedor	container
en vez de	instead of
intentar	to try to
la lata	tin, can
el malgasto	waste
el papel (reciclado)	(recycled) paper
la papelera	wastepaper basket
la pila	battery
el plástico	plastic
ponerse	to put on (clothes)
los productos químicos	chemicals, chemical products
el proyecto	project
recargable	rechargeable
reciclar	to recycle
reutilizar	to reuse
la Tierra	Earth
tirar	to pull, to throw away
tratar de	to try to
el vidrio	glass

7.1F Protegiendo el medio ambiente

la basura	rubbish
la bombilla (de bajo consumo)	(low-energy) light bulb
el combustible	fuel
combatir	to fight, to combat
la contaminación atmosférica	air pollution
desaparecer	to disappear
el desastre	disaster
desconectar	to disconnect, to unplug, switch off
deshacer	to undo
los desperdicios	rubbish, refuse, waste
la especie	species
incluso	even
inquietante	worrying
luchar	to struggle, fight
la medida	measure, means
medioambiental	environmental
el motor	engine
los residuos	refuse, waste, rubbish
salvar	to save

7.2G Los necesitados

a favor (de)	in favour (of)
la alimentación	feeding, nourishment,food
la asistencia médica	medical care
asistir a	to attend
buscar	to look for
contribuir	to contribute
la creencia	belief
la culpa	blame, fault
la enfermedad	illness
en contra	against
estar dispuesto/a a	to be prepared to, to be ready to
faltar	to be lacking, to be missing
fresco	fresh
hace(n) falta	to be necessary, to need
la libertad (de pensamiento)	freedom (of thought)
merecer	to deserve
necesitar	to need
perder	to lose
perezoso/a	lazy
querer	to love

Key Verbs

Reciclar To recycle	Ir To go	Apagar To turn off	Hacer – to do/make	Encender To turn on
Reciclo I recycle	Voy I go	Apago I turn off	Hago I do	Enciendo I turn on
Reciclas You recycle	Vas You go	Apagas You turn off	Haces You do	Enciendas You turn on
Recicla Sh/e recycles	Va s/he goes	Apaga He/she turns off	Hace s/he does	Encienda He/she turns on
Reciclamos We recycle	Vamos They go	Apagamos We turn off	Hacemos We do	Encendemos We turn on
Reciclan They recycle	Van They go	Apagan They turn off	Hacen They do	Enciendan They turn on

7.2F Los “sin techo”

el destrozo	damage, destruction
escoger	to choose
la falta	lack
formar parte de	to be part of
el/la gamberro/a	hooligan, lout, troublemaker
maltratar	to mistreat, to ill-treat
los niños de la calle	street children
la ONG (organización no gubernamental)	NGO (non-governmental organisation)
la pobreza	poverty
recoger	to pick up
robar	to steal, rob
el vertedero	rubbish dump, tip
la violencia	violence
violento/a	violent

7.2H Es importante ayudar a los demás

el agua corriente (fem.)	running water
bastar	to be enough
la comisaría	police station
consumir	to consume
la corriente	(electric) current, electricity supply
crear	to create
la criminalidad	crime
cualquier(a)	any
el empleo	job
el/la encargado/a	person in charge
el éxito	success

7.1H Problemas ecológicos

acercarse a	to approach
el agujero	hole
la aldea	(small) village
alejar	to move (something) further away
alejarse de	to move further away from
amenazar	to threaten
arruinar	to ruin
el atasco	traffic jam, hold-up
el ave (marina) (fem.)	(sea) bird
el calentamiento global	global warming
la capa de ozono	ozone layer
el casco	helmet, hull (of ship)
el centenar	about a hundred
la central eléctrica	power station
la circulación	traffic
constituir	to constitute
cortar	to cut, to cut off
el efecto invernadero	greenhouse effect
extender	to spread, to stretch
frenar	to brake, to put a stop to
el humo	smoke
el huracán	hurricane
el incendio	fire
la lluvia	rain
la mancha	stain
la marea negra	oil slick
la muerte	death
el nivel	level
el petrolero	oil tanker
el/la pescador/a	fisherman/fisherwoman

GCSE Unit 7 SPANISH Knowledge organiser. Topic Global Issues

Translation Practice. G – blue F – orange H - Green	
_____ agua	**I save** water
_____ transporte público	**I use** public transport
Uso pilas _____	I use **rechargeable** batteries
_____ al instituto a pie	**I go** to school by foot
_____ latas	**I recycle** cans
_____ el uso de productos químicos	**I avoid** the use of chemical products
Es necesario tomar _____ urgentes	It's necessary **to take** urgent measures
_____ que luchar	**We have** to fight
_____ que proteger el medio ambiente	**We must** protect the environment
_____ uso bolsas reciclables	I **always** use recyclable bags
_____ reciclar lo mucho que posible	**I try** to recycle as much as possible
No _____ nada	**I don't recycle** anything
_____ ayudar	**I want** to help
Me _____que hay tanta probreza	It **worries** me that there is so much poverty
Me _____ que hay gente sin comida	It **annoys** me that there are people without food
Me _____ de que tu hermana pueda ayudar	I'm **delighted** that your brother can help
Me _____ triste la situación	It **makes** me sad the situation
Nos ____ falta recursos	We are **missing** resources
Me _____ mucho	It **matters** to me a lot

Key Questions: Answer the following in your own words. Use these model answers	
¿Qué haces para ahorrar energía/agua?	Me importa ahorrar energía y agua. Normalmente me ducho en vez de bañarme. Siempre cierro los grifos. Intento no malgastar agua o energía. Me pongo un jersey en vez de ponerla calefacción y solo pongo el lavaplatos cuando el lavaplatos está lleno.
¿Qué cosas reutilizas?/reciclas? / ¿Usas papel reciclado?	Me preocupa el reciclaje. Me importa reutilizar cosas y reducir el malgasto de recursos. Uso pilas recargables y reutilizo bolsas de platico. Reciclo las latas, el papel, y el cartón, el plástico y el vidrio. Siempre separo la basura.
¿Qué deberías hacer para proteger el medio ambiente?	Hay muchas cosas que deberías hacer para proteger el medio ambiente. Deberías apagar las luces, el televisor y el ordenador. Tienes que cerrar las puertas en casa y debes reciclar las latas, las bolsas de plástico y el vidrio. Debes bañarte lo menos posible. Deberías usar el coche lo menos posible.
¿Qué vas a hacer para proteger el medio ambiente?	En el futuro voy a reciclar más. Siempre voy a reciclar las botellas de vidrio y de plástico. Voy a apagar el televisor y el ordenador cuando termino. Voy a ir lo más posible en bicicleta o a pie. Voy a ir en coche lo menos posible.
¿Qué hiciste ayer para proteger el medio ambiente?	Ayer reciclé la basura en casa. Ayer separé la basura en casa para mis padres. Ayer fui a colegio a pie en vez de ir en autobús/en coche. Ayer cerré las puertas y las ventanas en casa para conservar el calor en casa.
¿Qué es el problema del planeta que te preocupa más?	Lo que más me preocupa es la deforestación/el problema del tráfico/la sequía/las mareas negras/la contaminación del aire porque es importante evitar el cambio climático/porque causa huracanes/sequias/el calentamiento global/los incendios forestales/las enfermedades de los pulmones/afecta la flora y la fauna/ los animales/los seres humanos/amenaza el planeta//amenaza la vida humana/la vida de los animales.

Key Grammar	
Future Tense ('will…')	**All verb groups:** -é, -ás, -á, -emos, -éis, -án *With this tense, do NOT take the verb ending away but ADD it on to the infinitive.*
Forming the conditional ('would like to' tense). Always remove the –AR, -ER, -IR endings first	Remember the conditional ('would') tense endings for –AR, -ER, -IR verbs. They are: -AR, -ER, -IR: -ía, -ías, -ía, -íamos, -íais, -ían
Using the immediate future tense IR + A + INFINITIVE	Voy a casarme = I'm going to get married Va a discutir con su padre = He / She is going to argue with his/her father

9. Customer Needs

For a business to be successful, it must understand what customers need. There are six main areas to consider.

Area of Consideration	Why?
Price	For most consumers, most of the time, price is a crucial factor when considering purchasing a product. Pricing a product too high will put consumers off, pricing a product too low may lead the consumers to question the quality of the product and look to competitors.
Quality	Consumers will always consider the quality of a product when purchasing it. Products that lack quality and durability may be rejected by consumers for more reliable products
Choice	Consumers love choice, even though it can sometimes be hard to make decisions in the face of 'too much' choice.
Convenience	Consumers want easy access and to not travel to far. Businesses will need a full range of stock, short ques at checkouts and a clearly laid out store/website to give the customers a convenient experience.
Being efficient and reliable	Customers expect consistently good value for their own time and good customer service. Consumers expect high standards to meet every time they use the goods/services provided.
Providing great design	Many customers value design and style above price. They want clothes that make them look and feel great, cosmetics that make them look older – or younger – and cars that make them feel successful. Product design can be one way that businesses meet the needs of their customers.

10. Customer Needs

Term	Definition
Choice	Giving customers options and increasing the chance that the product will be perfect for the tastes/habits of one type of customer.
Convenience	Making life easier for customers, perhaps by a great location or a product that saves time in preparation or consumption.
Identifying Customers	Finding out who they are: their age, gender, incomes, where they live and what they want
Quality	to a customer quality means getting what they want at a good standard of manufacture or perhaps better than expected; some companies use the term 'customer delight'.
Understanding Customers	Learning why customers do what they do, making it easier to see how to make a product that better suits them.

11. Market Research

There are four main areas where market research can prove useful:

Area	Why?
To identify and understand customer needs	For any Business, understanding the needs of customers is important. Employing market research to finds is well worth the time of a business
To identify gaps in the market	Market research along with market maps show which customer requirements are covered and which are not.
To reduce risks	Market research reduces risk in two ways: • **Market research clarifies whether there is demand for a product** • **Whether the market needs new products**

9. Customer Needs

For a business to be successful, it must understand what customers need. There are six main areas to consider.

Area of Consideration	Why?
Price	
Quality	
Choice	
Convenience	
Being efficient and reliable	
Providing great design	

10. Customer Needs

Term	Definition
Choice	
Convenience	
Identifying Customers	
Quality	
Understanding Customers	

11. Market Research

There are four main areas where market research can prove useful:

Area	Why?
To identify and understand customer needs	
To identify gaps in the market	
To reduce risks	

12. Market Research – Methods of Research

Term	Definition
Focus Group	A group discussion among people selected from the target market; it draws on psychology to provide qualitative insights into consumer attitudes
Primary Research	Research conducted first-hand; it is tailored to a company's specific need, for example a quantitative sales estimate for a brand-new chocolate bar.
Qualitative Data	In depth research into the opinions and views of a small group of potential or actual customers; it is non-numerical and can provide useful insight into why consumers buy what they buy.
Quantitative Data	Factual and numerical research to provide statistically reliable results, for example a survey of 500 people aged 15-24 years.
Secondary Research	When a company uses research that has already been carried out by another organisation.

13. Market Segmentation – How is the market segmented

Ways the market is segmented	Explanation
Location	Customers located in the same area will share tastes and habits. **The menu for McDonalds is different in every country considering national tastes**
Income	Customers with different incomes will have different tastes and desires. Customers with high incomes are more likely to purchase more luxury items
Lifestyle	Whether rich or poor, young or old some people are simply different. Different lifestyles manifest different needs.
Age	People of different ages have different preferences and different desires.
Demographic Factors	Demographics are the characteristics of a population – different parts of a population have different needs **e.g. gender, race and religion etc.**

14. Market Mapping (Key Terms)

Term	Definition
Competition	Rival businesses operating in your market or market sector.
Gap in the market	An area on a market map where few or no existing brands operate, implying a business opportunity to fill an unmet consumer need
Market Map	Measuring where existing brands sit on a two-factor grid, for example young/old compared with high price/low price.

15. Why Map a Market?

Why?	Explanation
Helps you find a gap in the market	A market map can help a potential entrepreneur find an area within a market to exploit
Helps you find where you competitors are placed with a market	A market map can help a potential entrepreneur see where competitors are positioned within a market and furthermore ensure their own product is sufficiently unique.

16. The Competitive Environment

Why is competition good for markets?
Firms will need to provide good products and good services
Keeps prices competitive.
The market will provide more innovative products or services to break away from fierce competition from other firms

12. Market Research – Methods of Research

Term	Definition
Focus Group	
Primary Research	
Qualitative Data	
Quantitative Data	
Secondary Research	

13. Market Segmentation – How is the market segmented

Ways the market is segmented	Explanation
Location	
Income	
Lifestyle	
Age	
Demographic Factors	

14. Market Mapping (Key Terms)

Term	Definition
Competition	
Gap in the market	
Market Map	

15. Why Map a Market?

Why?	Explanation
Helps you find a gap in the market	
Helps you find where you competitors are placed with a market	

16. The Competitive Environment

Why is competition good for markets?

1. Product (Part of the Marketing Mix)

When designing a new product, the key is to design a product that matches the needs or wants of your chosen target market. Every product needs the right balance between:

Product strategy	Explanation
Economic Manufacture	Making sure that the design of the product to be made cost effectively. A complex or expensive design can lead to increased costs.
Function	The design of the product is crucial. The product must work/function effectively
Aesthetics	How much does the design of the product appeal to the senses. When designing a product it is crucial to consider the way it looks

2. Product (Key Terms)

At the heart of the marketing mix is the product

Term:	Definition:
Product Differentiation	The extent to which consumers see your product as being different from its rivals
Product Life Cycle	The theory that every product goes through the same four stages of introduction, growth, maturity and design

4. Ways to extend the Product Life Cycle of a Product

Idea:	Explanation
Find new uses for the product	If a product can be used for multiple purposes, ensure that your target audience is aware of this
Change the appearance, format or packaging	Changing the appearance of a product can give it a new lease of life and allow the customer is perceive it as new again.
Encourage use of the product on more occasions	If a product can be used for multiples different occasions make sure the customer base is aware of this
Adapt the Product	Continue to make small adaptations to products to improve the quality of the product on offer.



3. Stages of the Product Life Cycle

Term:	Explanation:
Introduction	First a company needs to spend time researching the product and the marketplace. The product will be developed, tested, and launched.
Growth	At this stage the product becomes known in the market. At this stage customer awareness increases, prices will still be high.
Maturity	At this point the market may become saturated as 'me too' products are launched into the market. Advertising is increasing to remind consumers about the quality of the product. Brand image needs reinforcing with its customers. The market is highly competitive, and prices are lower as a result
Decline	The product's sales and profit's start to fall. The product is no longing offering what customers want or new technology has made the product obsolete.

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Product strategy	Explanation
Economic Manufacture	
Function	
Aesthetics	

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At the heart of the marketing mix is the product

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Product Life Cycle	

3. Stages of the Product Life Cycle

Term:	Explanation:
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Growth	
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Decline	

4. Ways to extend the Product Life Cycle of a Product

Idea:	Explanation
Find new uses for the product	
Change the appearance, format or packaging	
Encourage use of the product on more occasions	
Adapt the Product	



5. Promotional Strategy (Part of the marketing mix)	
Promotional strategy is the plan for how to communicate effectively with customers in order to meet sales revenue targets.	
Promotional Strategy:	**Explanation:**
Advertising	Advertising is how a business promotes its products and communicates with its customers.
Sponsorship	Sponsorship is where a business pays to have a brand or company name attached to an activity that has credibility with its customers.
Branding	Branding is a way that businesses can give their products an identity that appeals to its target audience.
Product Trials	A product trial means giving potential customers a free taste of a new product. This may entice new customers.
Special Offers	Businesses can use special offers such as 'buy one get one free' to entice customers to purchase their products.
Using Technology	In recent years, online advertising through social media and other platform such as websites and e-newsletters has become commonplace for firms.

6. Pricing Strategy	
Pricing strategy is vital for any business – pricing your products can be the difference between business success and business failure.	
Market Segment:	**Pricing Strategy**
Mass Market	In mass markets where both competition and customer consumption are high. These markets are generally characterised by low prices and very similar products.
Niche Markets	A niche market is based on a type of customer needs or wants something different to the majority. Generally these markets have few competitors but high prices.
Pricing at each stage of the Product Life Cycle	
Introduction	Pricing at the introduction phase of the product life cycle in some cases will be low to entice new customers to sample the product.
Growth	Once a product is established within a market and has a customer base, businesses will sometimes increase prices to increase revenue.
Maturity	When product growth is at an end, new pricing decisions may be needed. Business will ensure that pricing is competitive to ensure continuous revenue, other firms may decide that the brand may be in irreversible decline and will keep prices high to make a short-term profit.
Decline	When sales have made a decisive step downwards, firms tend to lower prices to ensure a steady stream of revenue. However some firms with a loyal customer base may decide to increase prices in an attempt to gain short term profits.

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Mass Market	
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Pricing at each stage of the Product Life Cycle	
Introduction	
Growth	
Maturity	
Decline	

7. Placing Strategy

This element of the marketing mix is about how to get the product from the producer to the customer. There are three main distribution channels – traditional, modern and direct.

Type of Distribution	Explanation:
Direct Distribution	This is where a product is distributed directly from the producer to the consumers. An example of this is buying things directly from firms on the internet.
Modern Distribution	This method is common in the grocery sector, where producers will deliver to distribution depots and then the products will be taken to stores to be sold. This method became popular when supermarkets become common place in the 1980s
Traditional Distribution	This method, in the first instance involves a wholesaler buying goods directly from the consumers. From their the wholesaler will sell the products directly to firms who will then sell onto the consumers.

8. Placing Strategy – Key Terms

Term	Definition
Distribution	How ownership changes as a product goes from producer to customer
E-Tailer	An electronic retailer; in other words selling products electronically, either by e-commerce or, more likely these days, mobile commerce.
Retailer	A shop or chain of shops, usually selling from a building in a high street or shopping centre

9. Marketing mix and Business Decisions – Key Terms

Business decisions are always about the future. So, when the marketing mix is being used to inform and carry out business decisions.

Term	Definition
Budget	A ceiling on the amount of money that can be spent; a marketing budget of £1 million means the marketing manager can spend up to that figure, but no more.
Informed Decisions	Evidence that can be used to make a better decision; a company can gain a better understanding of it's customers through the 4p's, which helps in decision making

7. Placing Strategy

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Type of Distribution	Explanation:
Direct Distribution	
Modern Distribution	
Traditional Distribution	

8. Placing Strategy – Key Terms

Term	Definition
Distribution	
E-Tailer	
Retailer	

9. Marketing mix and Business Decisions – Key Terms

Business decisions are always about the future. So, when the marketing mix is being used to inform and carry out business decisions.

Term	Definition
Budget	
Informed Decisions	

Year 11 Term 2 : Topic = Personal project

How you are assessed

Assessment Objectives:
Each component is marked based on 4 assessment objectives: You will be assessed on how effectively you meet the criteria set out in each objective.

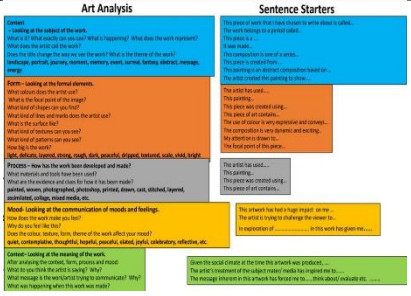
6 Key Words for this term

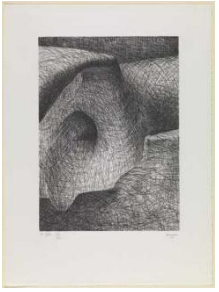
1 Observe
2 Develop
3 Critical understanding
4 context
5 inspiration
6 juxtaposition

A.	What three techniques will you develop next in your project?









G.	Assessment objectives A01, A02
A01	Assessment Objective 1 AO1 Is about developing ideas from a starting point through to a final outcome. This is achieved by responding in sketch format by taking inspiration from a variety of artists.
AO2	Assessment Objective 2 AO2 is about refining your ideas through the selection of appropriate media , materials, techniques and processes, and should be linked to the artists you have studied. You should be annotating your work showing clearly these connections



G.	*Have you explored the following techniques*
Drawing	
Etching	
Collage	
Painting	
Sculpture	
Installation	
Photography	
Inks	

G.	Assessment objectives A03 , A04
A03	Assessment Objective 3 A03 is about recording your ideas, observations and insights. These can be visual shown through your use of materials, media and processes. As well as the way you develop your ideas, skills and techniques with written annotation.
A04	Assessment Objective 4 A04 is about presenting a personal, informed and meaningful response, from your initial research through to your final piece. This should be visible through suitable source material and media, the connections you made to your chosen artist and your ability to select appropriate media. You work should be seen as a visual 'journey' from your starting point through to your final piece, that demonstrates your understanding of your particular area of study.

Key questions

If you are looking at an image and don't know how to respond to it break it down into its individual parts.

What colour is it? - could you make a response just looking at its colour or shape?
How does it make you feel? Could that trigger an instinctive/ expressive response
Could you respond to the shape or texture?
Could you delve deeper into the social or historical context of the piece of artwork?
Your key areas of focus should be on figuring out how you can turn your piece of artwork into something else. Your GCSE is a series of developments and experiments leading up to your exam





Year 11 PRODUCT DESIGN Term 2

What we are learning this term:

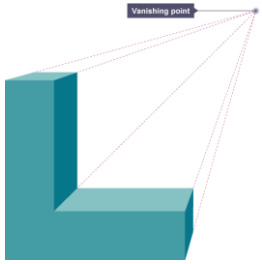
A. One-Point Perspective B. Two-point Perspective C. Isometric Drawing
D. Exploded Drawing E. Oblique Drawing F. CAD G. Orthographic Drawing

Design Strategies Introduction.

Design strategies are used to create technical drawings, to show an object in 3D on a 2D page. Perspective drawings show an object getting smaller in the distance. The rest are done to scale.

A. One-point Perspective Drawing

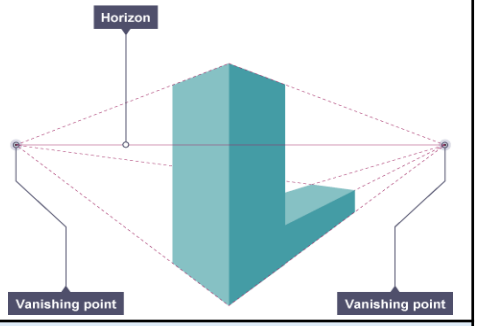
Single-point perspective shows an object from the front in a realistic way. The front view goes back towards a vanishing point on the horizon.



Commonly used by interior designers to a show a view into a room.

B. Two-point Perspective Drawing

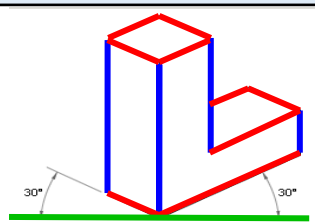
Two-point perspective shows an object from the side with two vanishing points. It gives the most realistic view of a product as it shows the item edge on, as we would see it. It is often used to produce realistic drawings of an object.



Commonly used by architects to show realistic building ideas.

C. Isometric Technical Drawing

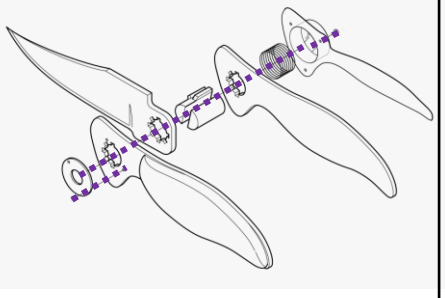
Made up of a series of parallel **vertical lines** and parallel **30-degree lines**. But no **horizontal lines.**



Used by architects and engineers to communicate their ideas to the client and manufacturer.

D. Exploded Technical Drawing

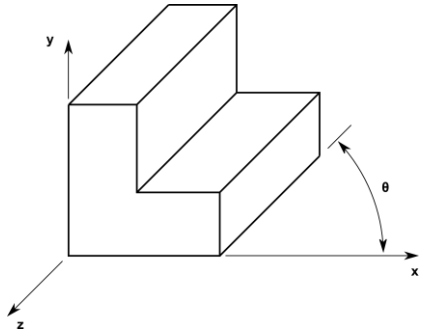
Exploded technical drawing is an Isometric drawing of all the parts and components of an object.



All parts are shown separately so you can see all aspects. **Dashed lines** indicate where everything goes and in what order.

E. Oblique Technical Drawing

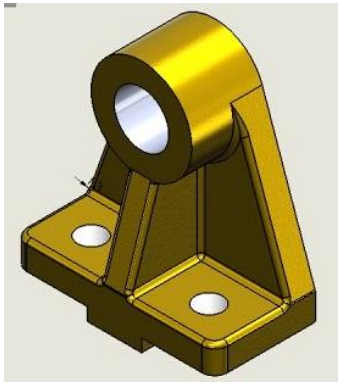
Consists of an object where the front view is drawn flat with height and width of the object draw to the correct lengths. Diagonal lines are drawn at 45-degrees.



Commonly used by engineers for drafting ideas.

F. CAD (Computer Aided Design)

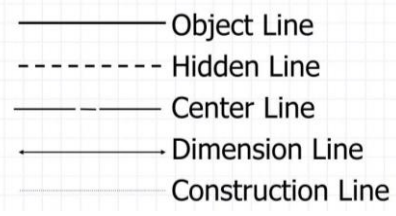
This is designing using a computer using a software such as 2D Design or Solidworks.



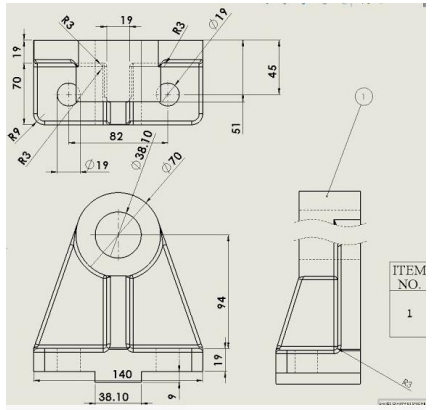
Commonly used to model, test and develop an idea before manufacture.

G. Orthographic Projection – 2D NOT 3D Drawing Strategy!

This shows 2D views of a 3D object from different angles – front, plan and end. Lines are dimensions have specific meaning to avoid confusion.



Commonly used in industry to help the manufacturer understand the design.



Year 11 PRODUCT DESIGN Term 2

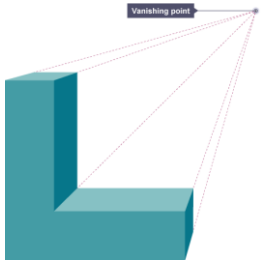
What we are learning this term:

A. One-Point Perspective B. Two-point Perspective C. Isometric Drawing
D. Exploded Drawing E. Oblique Drawing F. CAD G. Orthographic Drawing

Design Strategies Introduction.

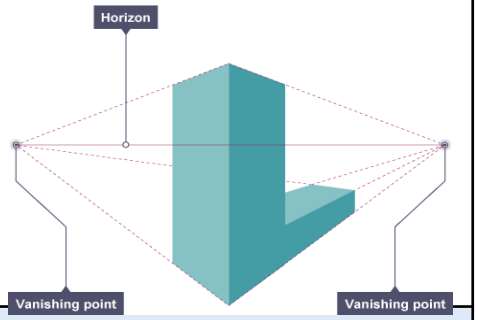
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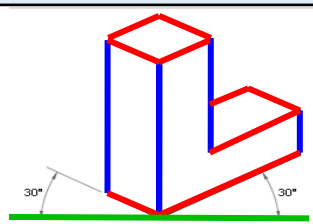
Commonly used by interior designers to a show a view into a room.

B. Two-point Perspective Drawing



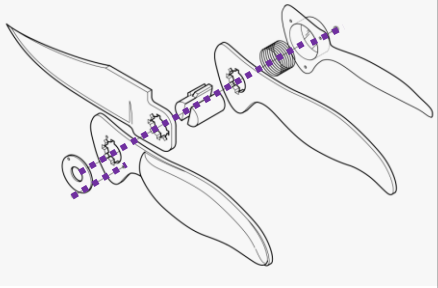
Commonly used by architects to show realistic building ideas.

C. Isometric Technical Drawing



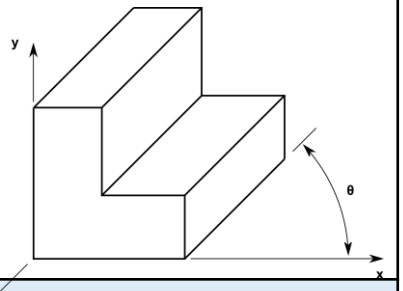
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D. Exploded Technical Drawing



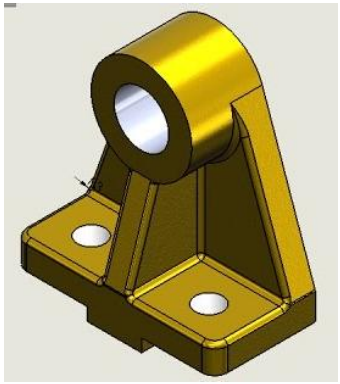
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E. Oblique Technical Drawing



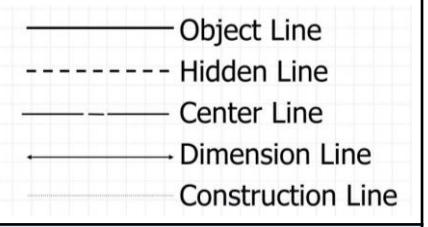
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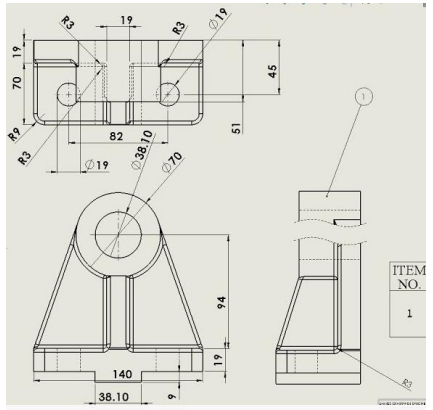


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Year 11 Food & Nutrition Term 2

What we are learning this term:

A. Healthy Eating Guidelines B. Nutritional Needs of Different Age Groups C. Energy Needs and Portion Sizes D. Diet-Related Health Problems

A. Healthy Eating Guidelines

	**5 portions** of **fruit** and **vegetables** a day – making up **1/3** of daily food intake
	Using **unsaturated oils** and **spreads,** and **not often**
	**Protein: lean** cuts and **unprocessed** meat best, plus **2 portions** of **fish** per week **(1 oily)**
	Having some **dairy** or **alternatives** and trying **lower fat** options
	**1/3** of daily food intake being **starchy carbs**. Go for **higher fibre/wholegrain** options
	**6-8 glasses** of **fluids** a day (but **no more than 1** being **fruit juice**)
	Eat **less sugary, salty** and **fatty** foods.

B. Nutritional Needs of Different Age Groups

Children & Teens 	• Still **growing** so need a lot of **energy** • **Young** children need **small** and **frequent** meals • Lots of **calcium** • **Stress** during **teenage** years can affect **eating habits**
Adults 	• **Stop** growing and nutritional needs **don't vary** much • Should focus on maintaining a **balanced** and **healthy** diet
Elderly Adults 	• Muscle **decreases** and exercising is **harder** – diet may **change** • **Taste** and **smell** changing can affect the **enjoyment** of food
Other Factors	• Males usually **bigger/taller** = more daily kcal needed • **Iron** is lost during **menstruation** = **higher iron** requirements • **Bone density** can be lost after the **menopause** = important to get lots of **calcium** and **Vitamin D** • Towards the end of **pregnancy**, the body needs **200 more kcal** per day to support **baby's growth** • **Active** humans will need **more kcal** and **protein**

C. Energy Needs & Portion Sizes

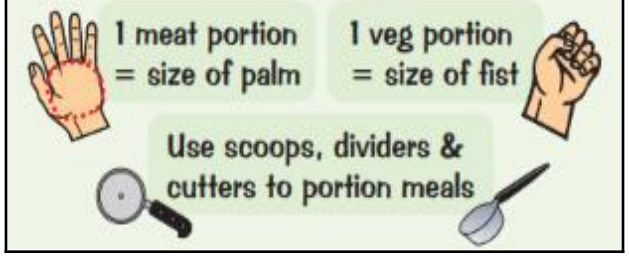
BMR	**Basel Metabolic Rate** is the amount of energy needed to **live e.g. breathing**. It's affected by many factors; **age, sex, weight, exercise**
PAL	**Physical Activity Level** measures how **active** you are. A **higher PAL** means **more active**.

Daily energy requirement (kcal) = BMR x PAL

To maintain a healthy weight, energy intake must be balanced:

Energy in > energy out = weight gain
Energy in < energy out = weight loss

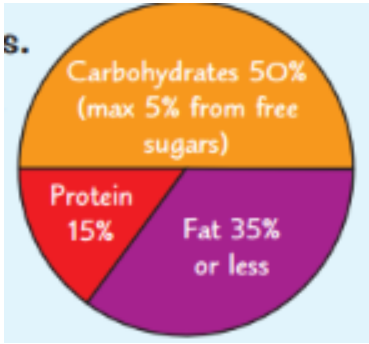
Portion size: prepare the right amount e.g.



D. Diet-Related Health Problems

	Example of cause	Health Problems
Obesity	Eating lots of sugary and fatty foods	High blood pressure and cholesterol
Coronary Heart Disease	Eating lots of saturated fats	Blood clots and heart attacks
Anaemia	Not eating enough iron-rich food	Tiredness, heart palpitations
Type 2 Diabetes	Being overweight or obese / too much sugar	Kidney failure, poor eyesight
Rickets (children)	Not enough Vitamin D or Calcium	Soft bones may lead to lowed legs
Osteoporosis (old age)	Malnutrition and not enough Calcium	Loss of bone density, brittle bones break easily
Tooth Decay	Plaque build-up from eating too many sugary foods	Fillers, loss of teeth

Recommended ratio for energy sources:

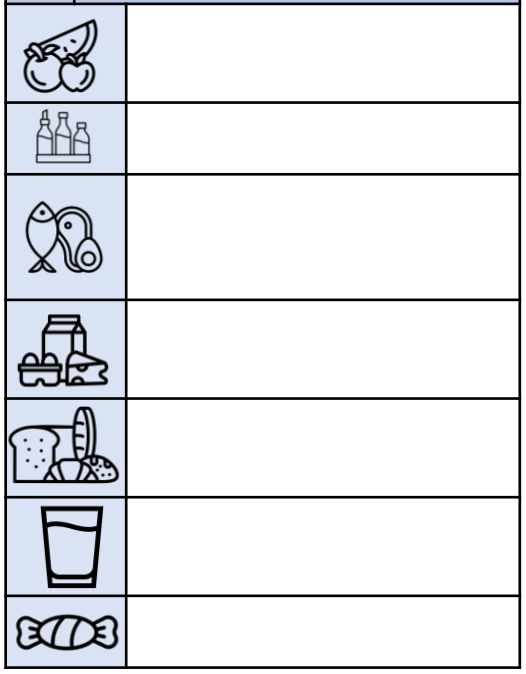


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A. Healthy Eating Guidelines



B. Nutritional Needs of Different Age Groups

Children & Teens	
Adults	
Elderly Adults	
Other Factors	

C. Energy Needs & Portion Sizes

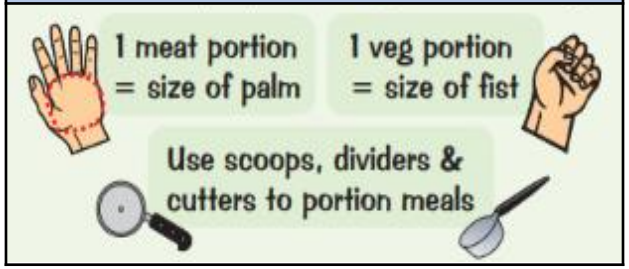
BMR	
PAL	

Daily energy requirement (kcal) = BMR x PAL

To maintain a healthy weight, energy intake must be balanced:

Energy in > energy out = weight gain
Energy in < energy out = weight loss

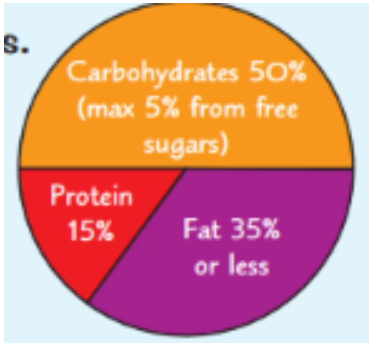
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Recommended ratio for energy sources:



Year 11 Engineering Term 2

Understanding the effects of engineering achievements

Types of engineering developments

Structural design – the development of components designed to resist or apply **forces**, for example the frame of a bicycle

Developments include – the use of frames, triangulation and shell structures, the use of CAD to test the structural integrity of a product before manufacture.

Mechanical design – the development of components designed to perform a physical function..

Developments include - Suspension systems, gears and pulleys, chain drives, the use of mechanical advantage.

Electronic design – The development and use of electronic components within products.

Developments include – smart home devices with connectivity to user's mobile phones, touch screen controls, miniaturization of transistors (smaller and more powerful circuits).

Effects of engineering developments

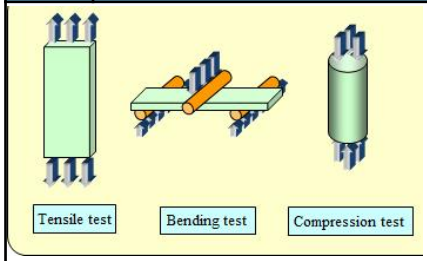
Frame and shell structures: The introduction of cheap and strong materials led to high-rise buildings, fast construction methods and a broad range of shell-frame products (cars, airplanes).

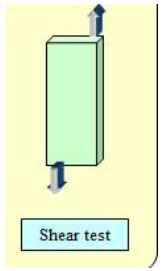
Development of new materials:
- Some give improved strength and reduced weight
- Smart materials and new alloys increase the diversity of products that can be designed
- Complex synthetic materials are difficult or impossible to recycle

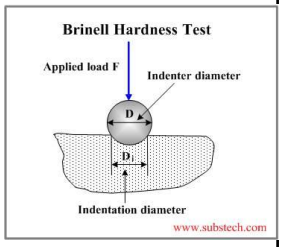
Smart technology:
- Smart home products in the home leads to designers focusing on linking more products to Bluetooth/wifi
- Smart tech can improve quality of living in a variety of ways
- Smart tech can be difficult to repair and become obsolete quickly

Electronic components:
- Miniaturization of circuits makes for smaller and faster products with increased data storage, making them more efficient and reliable
- The minerals used in complex circuits are finite and difficult to mine, leading to land destruction and pollution. These products are also hard to recycle

C. Mechanical property testing



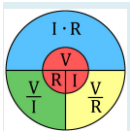




To conduct a fair test, you need to:
1. Have a clear question that can be answered through experiment
2. Change only one variable at a time and keep all other conditions the same
3. Repeat the experiment multiple times to avoid basing your conclusion on too few events
4. Use an **objective measurement system** that others can use in the same way
5. Avoid bias and consider the possibility of chance differences

Explain using notes and sketches questions:
1. Must have two or more drawings
2. Drawings must be annotated
3. Drawings and annotations must give a reasonable answer to the question in the setting they ask for i.e workshop tools used for a workshop process

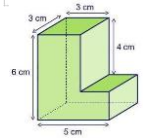
D. Use of calculations in engineering



Ohms law is used to calculate resistance, current and voltage.
Voltage = Resistance x current
Resistance = voltage / current
Current = voltage / resistance



When using mechanisms (levers, pulleys, gears etc) you can calculate the mechanical advantage using the formula:
Mechanical advantage = load / effort



Calculating the area of a variety of common shapes:
Quadrilateral - Base x height
Triangle – (base x height) / 2
Circle – $A = \pi r^2$
To calculate the volume of a prism, calculate the area of a face and multiply by the depth of the prism.

(1:2)
(real size: image)

Using scale factors when reading or producing working drawings:
Scales are shown as ratios, and calculated as fractions i.e a scale of 1:2 is the same as the drawing being ½ size.

E. How environmental issues affect engineering

Materials development	More emphasis on developing sustainable materials and recycling technology has had a positive impact on the engineering industry, for example the use of starch-based polymers.
Costs	Manufacturing can be made more efficient to reduce overall costs of production. However, some raw material costs are still volatile due to oil and ore scarcity.
Transportation	Transport is needed at each stage of the life cycle of the product and produces emissions: raw material extraction => manufacture = warehousing => retail => customer use => customer disposal => landfill
Usage	Are customers able to easily repair or maintain the product after it is purchased or does it have planned obsolescence?
Disposal	How do different countries dispose of products? Are there policies in place to ensure recycling?
Sustainability	What design features have been included in the product or its functions to reduce the impact of each stage of the product life cycle? Are the raw materials used renewable? How efficient is the manufacturing process with these materials?

Year 11 Engineering Term 2

Understanding the effects of engineering achievements

Types of engineering developments

Structural design – the development of components designed to for example

Developments include – the use of frames, and , the use of CAD to test the of a product before manufacture.

Mechanical design – the development of components designed to perform ..

Developments include - Suspension systems, gears and , chain drives, the use of .

Electronic design – The development and use of electronic components within products.

Developments include – smart home devices with connectivity to user's mobile phones, touch screen controls, (smaller and more powerful circuits).

Effects of engineering developments

Frame and shell structures: The introduction of cheap and strong materials led to

Development of new materials:

- Some give improved and reduced
- Smart materials and new alloys increase the diversity of products that can be designed
- Complex synthetic materials are difficult or impossible to

Smart technology:

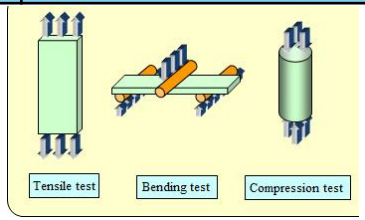
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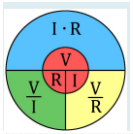
- The minerals used in complex circuits are and difficult to mine, leading to land destruction and These products are also hard to recycle

C. Mechanical property testing

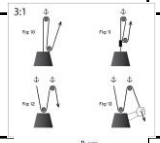


Describe, using notes and sketches, a test that could be conducted in the workshop to measure the ability of a ruler to tension. (include at least two drawings, annotations, and an explanation of the process and how it is recorded). **[6]**

Use of calculations in engineering

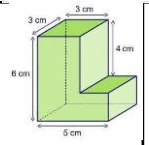


1. What is the current in a circuit with a voltage of 9 V and a resistance of 3 Ω?
2. If the resistance in a circuit is halved, what will happen to the current?
3. What is the resistance of a resistor in a circuit with a voltage of 12 V and a current of 0.5 A?



What is the mechanical advantage of the two pulley systems on the left? Think about how many anchor points there are.

1.
2.



What is the volume of the shape on the left?

What would the volume be if there were a 6mm diameter hole drilled through this shape?

(1:2) (real size: image)

1. A map has a scale 1:125,000. The distance between two points on the map is 3.8 cm. What is the real distance in kilometres?

How environmental issues affect engineering

Materials development	Name three modern materials that are sustainable and why.
Costs	Name three sustainable cost saving measures a company could take:
Transportation	What are the stages of a product life cycle that require transport?
Usage	Planned obsolescence is – The opposite of this is -
Disposal	What are the disposal options for a modern bicycle?
Sustainability	Name two modern sustainable materials and two finite resources: Describe a product that uses all four materials:

Toto: Africa

Soft rock

Form and structure:

The piece is in **strophic** or **verse-chorus** form.

Intro	Verse 1 / Verse 2	Chorus 1 / Chorus 2	Link 1 / Link 2	Instrumental	Chorus 3	Outro
1 – 4	5 – 39 / 14 – 39	40 – 57	58 – 65	66 – 82	40 – 92	93 – 96
4 bars	35 bars / 26 bars	18 bars	8 bars	17 bars	22 bars	4 bars

Metre and rhythm:

Simple duple time – 2/2 (split common time) – with two minim beats in every bar.

Uses distinctive **ostinato rhythms** for both riffs, consisting almost totally of **quavers**, with constant use of **syncopation**.

Vocal rhythm looks complex but follows the natural rhythm of the lyrics.

Background details:

Composed by band members **David Paich** and **Jeff Porcaro**.

Recorded by the American rock band Toto in **1981** for their fourth studio album entitled **Toto IV**.
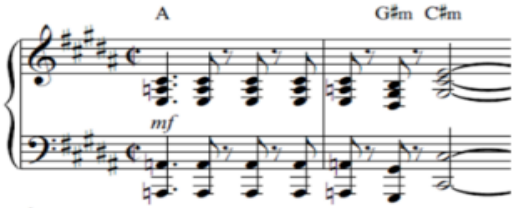
Released in **1982** and reached number one in America on 5 February **1983**.

Genre: **soft rock**.

Harmony:

Diatonic; mixture of root position and inverted chords.

Riff a can be heard during the intro, verses, link sections, instrumental and outro. This riff uses a three-chord pattern: **A – G♯m – C♯m**.



Choruses use a standard chord pattern: **vi** (F♯m) – **IV** (D) – **I** (A) – **V** (E).

The **harmonic rhythm** (the rate of chord change) is mostly once per bar.

Instrumentation:

Rock band: drum kit with additional percussion, lead and bass guitars, synthesisers, male lead vocals and male backing vocals.
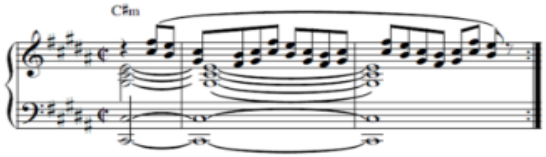
Dynamics:

Most of the song is ***mezzo-forte*** (moderately loud) whilst the choruses are ***forte***.

Melody:

Mostly **conjunct** (moving in step) with a **wide vocal range**.

Riff b uses the **pentatonic scale** (interpreted through E major):



Vocal improvisations occur towards the end of the song.

Texture:
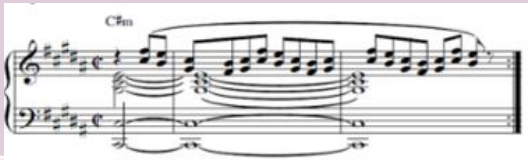
Homophonic: melody and accompaniment.

Tonality:

The majority of the song is in **B major** whilst the choruses are all in **A major**.

Tempo:

The tempo is **moderately fast**.

Question	Answer	Question	Answer
Identify the time signature of the piece	**4/4 3/4 2/2 2/4**	**Give the year the piece was recorded**	
Identify the tempo for this piece		**What type of ensemble performs this piece?**	
Underline the style of music for this piece	**Rock/Soft Rock** **Hip Hop** **Soul** **Pop**	**Identify and underline the riff below:** 	**Riff A** **Riff B**
Underline the tonality/Key used in the verses	**B Major** **A Major** **A Minor** **B Minor**	**List 4 instruments in this piece**	
Underline which rhythmic device is used for Riffs A and B	**Sequence** **Imitation** **Ostinato**	**List the sections of the piece where Riff A can be heard**	
Give the tonality/Key of the chorus		Identify the **texture** of the piece	
Identify the dynamics used in the verses			
Give the names of the band members who composed this piece.		**State the dynamics that are used in the chorus**	

Year 11 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:

A. Key words
B. What are the different types of health care services?
C. What are the different types of social care services?
D. What barriers are there to accessing care services?

A.	Key words for this Unit
Primary care	First point of contact when seeking health care
NHS	National Health Service – Tax funded health care in the UK.
Secondary care	Specialist health treatment and/or care
Tertiary care	Advanced specialist health treatment and/or care.
Allied health professionals	Professionals who are involved in patient care from diagnosis to recover
Clinical support staff	Support allied health professionals with the treatment and care of patients.
Foster care	A stable family home where care is provided on either a short or long-term basis.
Residential care	Accommodation and care for a number of children, young people or adults living together in one building.
Respite care	Short-term care which provides relief for family member who are carers.
Domiciliary care	Care received in the person's own home.
Sensory impairment	Difficulties with senses, most commonly vision and hearing.
Braille	Raised lettering to help visually impaired.
Occupational therapist	Offers support to develop independence for daily living activities.

B	What are the different types of health care services?
Primary Care	• Primary care is the first point of contact a patient is likely to have with the NHS – you can refer yourself to primary care providers. • Primary care providers include pharmacists, Registered GPs/doctors, walk-in centres, accident and emergency departments (A&E), dentists and Opticians.
Secondary Care	• Secondary care is specialist treatment or care. A primary care provider will refer a patient for secondary care if they feel it is necessary for the patient to receive further advice, tests or treatment. • Secondary care providers include cardiologists (heart), gynaecologists (female reproduction), paediatrics (children), obstetrics (childbirth and midwifery), psychiatry (mental health) and dermatology (skin).
Tertiary Care	• Tertiary Care is advanced specialist treatment or care. A secondary care provider will refer a patient for tertiary care for long-term treatment and/or care. • Tertiary care areas include spinal, cardiac (heart), cancer care, chronic pain, burns and neonatal (premature and ill new born babies).
Allied Health Professionals	• Allied health professionals work in a range of specialities They support patients through all stages of care – from diagnosis to recovery. To work with the public they must register with the Health and Care Professions Council (HCPC). • Allied health professionals include art therapists, dieticians, paramedics, physiotherapists, speech and language therapists and radiographers.
Clinical Support Staff	• Clinical support staff work within a range of departments under the guidance of allied health professionals. They are trained in their roles but are not required to register with the HCPC. • Clinical support staff include theatre support workers, prosthetic technicians, dietetic assistant, phlebotomist (collects blood samples), hearing aid dispensers and maternity support workers.

C.	What are the different types of social care services?
Children and young people	• Children and young people may need support on a temporary or permanent basis because their parent of carer is ill; they have family problems, they have behavioural issues or additional needs. • Types of support for children and young people include foster care, residential care and youth work.
Children or adults with specific needs	• Children and adults may need support with specific needs including learning disabilities, sensory impairments and long-term health issues. • Types of support for children and adults with specific needs include residential care, respite care and domiciliary care.
Older Adults	• Older adults may need support with a range needs including arthritis, cardiovascular disease, dementia and depression. • Types of support for older adults include residential care, carers and personal assistants.
Informal Social Care	• Not all carers get paid for what they do – they are known as informal carers and social services would really struggle without them. • Informal carers include a spouse or partner, children, friends and neighbours. • Informal carers do practical household duties, shopping, laundry, walk the dog and help with personal care.



D.	What barriers are there to accessing care services?
Physical Barriers 	• Difficulty accessing care due to mobility and/or disability. • Obstacles include uneven and rough pavements and services, narrow doorways, no lift and transport. • Access could be improved by planning journeys in advance and reporting any problems to the council.
Sensory Barriers 	• Sensory impairments can be a barrier to accessing care. • A person with poor vision may need glasses or documents in large print. Profound sight problems may benefit from Braille. • A person with a hearing impairment may benefit from a hearing aid or sign language interpreter.
Social, Cultural and Psychological Barriers 	• Social, cultural and psychological barriers may leave people feeling nervous about accessing support. • These can include: religion/cultural barriers, negative experience, self-diagnosis, substance misuse, opening hours. • Care services can give individuals opportunities to share their concerns, offer different gender practitioners, facilities to worship and show respect and understanding.
Language Barriers 	• Language can be a barrier to accessing care services because individuals and care providers may struggle to understand each other. • Support for individuals could include translated documents, translators and interpreters and support from family members.
Geographical Barriers 	• Individuals may struggle to reach care services because public transport may not run regularly, specialist treatments may require long distance travel and travel can be expensive. • Support could include being provided with direct travel or having travel costs reimbursed.
Intellectual Barriers 	• If an individual has a learning disability is can cause difficulty in them accessing care services. • Support might include a learning disability nurse, speech and language therapist or occupational therapist.
Resource Barriers 	• As the population ages and more disorders are being successfully treated, there is a huge strain on health and social care resources – at times it might seem that not everyone can access what they need. • There are huge staff shortages which puts strain on people that work in the health and social care sector.
Financial Barriers 	• Seeing a GP or using emergency services are free but some services, such as optical and dental care, often involve some payment. • This can be difficult for people if they are from a low-income household as they may not feel they can afford to access the care they need.

Year 11 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:
E. Define the key words F. What are the care values and how can they be implemented?

E.	Define the key words
Self-respect	Valuing yourself
Person centred approach	Planning care around the wants and needs of a service user
Empowerment	Supporting people to take control of their lives and futures by involving them decisions on their care and treatment
Confidentiality	Not passing on information or discussing a private conversation to anyone
Dignity	Being respected and treated with care
Safeguarding	Policies to ensure children and vulnerable adults are protected from harm, abuse and neglect
Discrimination	Treating a person or group of people unfairly or less well than others
Compassionate	Feeling or showing sympathy and concern for others
Competence	The ability to do something successfully and efficiently
Consequences	A result or effect, typically one that is unwelcome or unpleasant
Review	Involves assessing or inspecting something with the intention of making change if necessary
Empathy	Being able to understand and share feelings and views of another person.
Insomnia	Difficulties in sleeping

F.	What are the care values and how can they be implemented?
Empowering and promoting independence 	• Empowerment is when an individual feels in control of their own life and have a say in what happens to them. • Some people might need help with empowerment because of their age, circumstances or confidence e.g. elderly people, children, adult with learning disabilities. • You can promote empowerment and independence by involving individuals, where possible, in making choices about their treatment.
Respect for others 	• You can show respect for the individual by respecting their privacy, needs, beliefs and identity. • Show respect by being patient when someone takes longer to perform simple tasks due to their age, disability or injury. • Do not leave personal files around for others to see or discuss your patients' case with friends. • Gain permission before entering a room, provide private place for personal conversations.
Maintaining confidentiality 	• It is a person's right by law to have information about them kept confidential. • Care workers and not allowed to talk about one service user to another, or someone who is not involved in helping them get better. This involves not having those private conversations in public places where other can overhear. • Paper and electronic files are to be kept confidential and only shared with care workers which are involved in the treatment of the patient.
Preserving dignity 	• Preserving the dignity of individuals to help them maintain self-worth, privacy and self-respect. • You do this by involving the person in their own care; helping them go to the bathroom; giving the person time they need, checking what they would like to be called; closing door or curtain when they are changing; making sure their clothes are clean; dealing with embarrassing situations sensitively and professionally.
Effective communication 	• In health and social care it is important to communicate effectively with service used in order to build trusting relationships. These can be lost of the care worker appears not to care or listen. • Recognising different communication needs and trying to overcome them shows that cares respect the individual e.g. when visually impaired providing a leaflet in braille; if can't speak English well, have a translator organised beforehand. • Show you value the person through showing empathy, asking questions, not judging, smiling, using their name, giving appropriate eye contact, open body language, giving time to process.
Safeguarding and duty of care 	• Health and social care workers have a legal duty to protect service users from harm, neglect or abuse. They must recognise the signs and symptoms of abuse so they can protect people. • Signs of abuse include low self-esteem, STDs, unexplained injuries or bruises, insomnia, change in appetite, change of personality, self-harming, fear of being alone etc. • What to do: report the abuse, never promise to keep the abuse secret, make it clear that you will have to tell someone e.g. your supervisor or the police. DUTY OF CARE • Care workers must work in ways that never put individuals at any risk or harms. They need to know their responsibilities, procedures, deliver care as the care plan states and always report and record any concerns about the service user even if they appear minor.
Promoting anti-discriminatory practice 	• Discrimination can be obvious but sometimes it can be subtle and hidden, and The Equality Act 2010 makes it illegal to discriminate against people because of their e.g. age, gender, race, disability, religion, sexual orientation, marital status etc. • You can promote anti-discriminatory practice by: having patience with someone who doesn't speak English well; communicating in a way that the person will understand; showing tolerance towards people who have different beliefs and values from you; challenging unkind behaviour.

Year 11 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:
G. How to apply care values in a compassionate way. H. Identifying own strengths and areas for improvement against the care values

G	How to apply care values in a compassionate way?
Show empathy and care by:	• Being patient • Showing sensitivity • Understanding • Actively listening • Having a positive outlook • Being encouraging • Having genuine concern for other people.
Care workers can check themselves against the '**Six C's of Compassionate Care**' checklist to make sure they are applying care values with compassion.	
Care	Helps to improve an individual's health and wellbeing. Care should be tailored to each person's needs and circumstances
Compassion	Shows the care worker understands what the individual is experiencing. Being empathetic to their situation shows care and value to the individual
Competence	Shows that care workers can safeguard and protect individuals from harm
Communication	How to adapt to individuals and their circumstances to ensure important information is given and shared- keeping the individual at the heart of everything that is done
Courage	Protecting individuals by speaking up if you think something is wrong; being brave enough to own up if you have made a mistake.
Commitment	Carrying out your duties to care for others to the best of your ability.

H	Identifying own strengths and areas for improvement against the care values
Working together	• All care works have the responsibility to uphold care values. If everyone works together, doing their 'bit', service users and colleagues alike will all be able to have positive experiences. • Put any feelings aside, some clients can show anger or aggressions towards you, continues to work in a way that respects each of the care values. Staff training: • Staff training keeps everyone updated. Even if they also ready had care values training it is important to have it again and remind them of their importance.

Making mistakes	• Everyone sometimes make mistakes. It is crucial that staff own up to mistakes that they have made, not matter how small. This is part of the duty of care to safeguard individuals, it demonstrates respect.
	• You need to be honest about your mistake, do not pretend it never happened and do not blame someone else.
	• You can:
	  • Tell your supervisor, admit it and apologise
	  • Be honest and accurate about what happened,
	  • Suggest ways to avoid it happening again
	  • Earn back the trust of the person involved
	  • Prove you can do the job
	  • Do no be too hard on yourself; seek help and guidance from others.

Reviewing own applications of care values	• One way to improve skills is to look carefully at the areas you are good at, what you are able to do well and things that you find difficult. • Knowing your strengths will allow you to take on task with ease and make you feel confident that you are doing a good job. • Knowing your weaknesses and what needs improving will help you work on them and develop. It is important to be open with yourself and others in order to progress further and be better at your job. • Regularly review your strengths and weaknesses because they change overtime
Receiving feedback	• The purpose of feedback is to let you know what you are doing well and the areas you need to improve. • This can be formal- like reports and following an observation at work and Informal- like chatting to colleagues at break time. • Both types encourage you to feel pleased with what you have done well and motivate you to improve in weaker areas, perhaps even provide a way forward. • Remember: when giving and receiving feedback, positives must be noted so that you know what you are doing well and continue to do so. Negatives are hard to uncomfortable to hear, but do not take them personally, you need them to get better at your job and feel more confident.
Using feedback	• Create yourself a SMART action plan to set yourself Specific, Measurable, Achievable, Realistic and Time-related targets or goals to help plan for your improvements

SWINDON ACADEMY READING CANON

Year 7


War Horse


A Monster Calls

Number the Stars


Chinese Cinderella


Sir Gawain and the Green Knight


Adventures of a Young Naturalist


The Pearl


The Hunger Games

The Canterbury Tales

Year 8


The Dark Lady


The Diary of a Young Girl


The Amazing Maurice


Salt to the Sea


Witch Child


Trash


Ghost Boys


The Bone Sparrow


The Giver

Year 9


Skin


I am Malala


Noughts and Crosses


Liccle Bit


Fahrenheit 451


The Black Flamingo


One


Simon vs the Homo Sapiens Agenda


Long Way Down


Northern Lights


The Boy Who Steals Houses


The Woman in Black


The Book Thief

Year 10


The Underground Railroad


The Curious Incident of the Dog in the Night-Time


The Hate U Give


Rani and Sukh


Pigeon English


The Boxer


1984


Orangeboy


The Outsiders

The Art of Being Normal

A Selection of Short Stories

To Kill a Mockingbird

#ReadingisPower