



BOURNEMOUTH SCHOOL

Year 9

Knowledge Organiser 5

Summer Term: 2024-25

Name: _____ Master Copy _____

Registration Form: 9

✓Hard Work

✓Discipline

✓Smart Appearance

✓Respect

Bournemouth School

Knowledge Organiser: Year 9 Summer

'Knowledge is power' by Francis Bacon

A knowledge organiser provides you with all the most important knowledge you need for each unit of study this half term. Your aim is to transfer all of this information into your long-term memory so you can use it in your lessons and further expand your understanding of this work.

How to use your knowledge organiser (KO):

1. Ensure you have your KO and Homework Learning journal with you at all times in school and when you need to do your homework at home.
2. In lessons when you have covered information that appears on your KO, your teacher will ask you to put a tick next to that section. This means that is now added to what you must learn for homework.
3. Initially, follow your homework timetable to decide what to revise each evening.
4. There are 4 strategies that you can use to revise. They are progressively more challenging so always start with the first in the list.

a. Look Cover Write Check

- i. Identify the subject and section of your KO that you want to revise. This should be one of the ticked sections.
- ii. LOOK carefully at the subject and section of your KO you want to revise and try to remember as much as you can. Remember this should be a ticked section.
- iii. Now COVER this information so you can't read it.
- iv. WRITE out what you can remember word for word in your Homework Learning Journal.
- v. CHECK what you have written by comparing it to your KO. Tick each correct word in green pen and correct any errors you have made.
- vi. Repeat this process until you are confident you can remember everything you need.

AIM:

You should be able to repeat the information by rote

b. Self or peer quizzing

- i. Identify the subject and section of your KO that you want to revise. This should be one of the ticked sections.
- ii. Write out a list of questions you could ask either yourself or a friend about this section of the KO. Write these in your Homework Learning Journal.
- iii. If you are working on your own, cover the KO and write a full answer to each question.
- iv. If you are working with a partner swap books and copy down their questions and have a go at answering them.
- v. Now uncover the KO and with a green pen correct your work.

AIM:

You should be able to repeat the information by rote but with a good understanding

c. Playing with words and sentences

- i. Identify the subject and section of your KO that you want to revise. This should be one of the ticked sections.
- ii. You now want to check how well you have learnt the information in your KO.
- iii. Definitions – look at words that are used in this section. Can you write a definition in your own words?
- iv. Rephrasing – can you rewrite the sentences or explanations in your own words?
- v. Summary – can you summarise the main points of this section of the KO?
- vi. Synonyms – can you write synonyms for key words and ideas?
- vii. New Sentences – can you write a sentence that includes the key vocabulary or definitions that you have learnt?

AIM

You should be able to use the information in your KO in a flexible and confident way in your writing.

d. Think it, Link it

- i. This is a technique to use towards the end of the half term when you are revising all of the KO.
- ii. Think of the links or connections between different sections of your KO.
- iii. Write these out in your own words in your Homework Learning Journal.
- iv. Think about the links between a particular section of your KO and what you have learnt in your lessons. Can you expand on this section by linking it to your wider knowledge?
- v. Write this out in your Homework Learning Journal.

AIM

You should be able to link your homework and your lessons to show a confident understanding of the work covered.

Homework Learning Journal

1. Always write the subject and the date when you start your homework.
2. Always write the strategy that you are going to use for your homework.
3. Always use a ruler to underline titles and dates.
4. Use a blue or black pen to complete your homework or a pencil if you need to draw.
5. Use a green pen to complete corrections of your work.
6. **You are expected to complete half a side of your Homework Learning Journal each evening as a minimum.**

Checking:

Your tutor will check your Homework Learning Journal at least once a week. If they are concerned that you aren't doing your homework properly they will offer support and guidance. If you don't respond to this guidance you will be added to the afterschool 'Success club' where a member of staff will help you complete your homework.

DO NOW tasks:

At the start of every lesson you should expect a Do Now task. This is a low stakes retrieval quiz on what you have learnt so far. If you have completed your homework this should be easy. The aim is to get 100% in each of these. If you miss this target occasionally, don't worry. If it happens regularly your teacher will ask your tutor to have a chat and offer you support.

Maths:

Your teacher will set you tasks to complete on Dr Frost Maths. This will be set every week on a Monday and will be collected in and checked on a Friday. If this has not been completed you will be issued a Detention on a Wednesday Lunchtime.

How long should I spend on my homework?

| Key Stage 4 | | | | | |
|-------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| Week 1 | | | | | |
| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
| 5 mins | MFL | MFL | Physical Activity | MFL | MFL |
| 10 | Maths | English | | Maths | English |
| 10 | Biology | RS | | Chemistry | Physics |
| 10 | Option C | Option D | | Option A | Option B |
| 55 | Reading / Revision | Reading / Revision | | Reading / Revision | Reading / Revision |
| Week 2 | | | | | |
| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
| 5 mins | MFL | MFL | Physical Activity | MFL | MFL |
| 10 | Maths | English | | Maths | English |
| 10 | Biology | RS | | Chemistry | Physics |
| 10 | Option C | Option D | | Option A | Option B |
| 55 | Reading / Revision | Reading / Revision | | Reading / Revision | Reading / Revision |

- You should spend about 35 minutes revising your KO each day.
- You should spend 25 minutes either reading or revising each day.
- This timetable is a guide. If you want to spend longer revising one subject that you find more difficult and less time on one you find easy, that is your choice.
- We would like you to spend one evening involved in a physical activity. This might be a sports club, a run, a game of football with friends or just a nice walk with the dog. Ask your PE teacher if you need guidance with this. It doesn't have to be on a Wednesday.
- In the summer term you will complete end of year assessments. Your teacher will give you specific revision activities to complete to guide you in what you need to revise for these tests. This will include all of your KOs for the year but may include some additional resources.

Artist Research

WHAT?

What are you looking at, Painting, Photograph, Design, Illustration, Mural?

Is it your work or the work of another artist?

Description, describe the image, pretend you are explaining what is in the picture to someone down the telephone.

First impressions PLUS MINUS INTERESTING

WHY?

Why do you think this was produced?

What was either the artist, photographer, or you trying to do or tell us?

Do you think there is a hidden message?

HOW?

How was the work produced?

Composition - where things are placed in the image

Materials - used (media)

e.g- hand drawn, painted, digital, photography

Lighting, Style, Pattern, Colour, Typography

Most important... USE

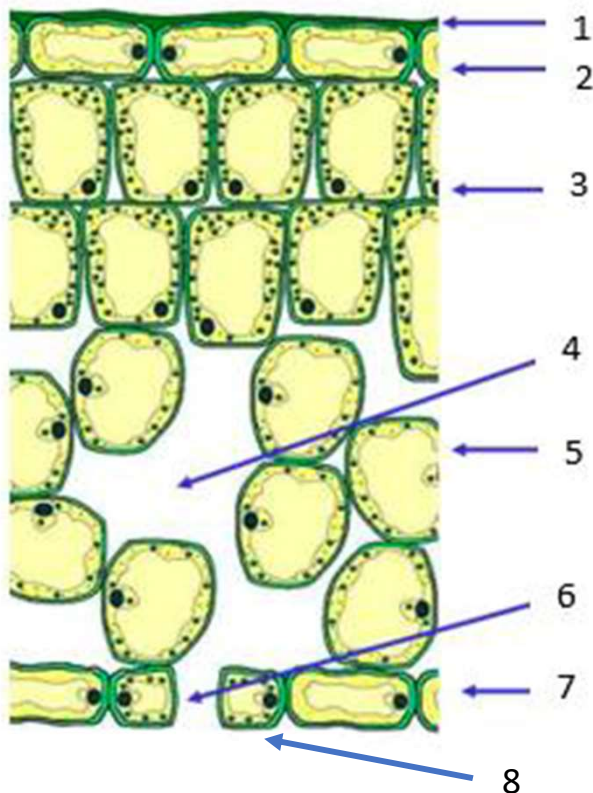
What use is this to you?

How does it link to your theme/question?

What ideas does it give you?

Does it suggest a new way of looking at the world around you?

| Term/ Keyword | Definition/ explanation | Tick |
|--------------------|---|------|
| Tracing | When tracing use light pressure to create fine lines that are easily hid by drawing or painting on completion of work. | |
| Graphite transfer | Using a graphite pencil to shade the back of the image you want to transfer, place on top of a clean piece of paper then draw on top of the image to create the transfer. | |
| Light box | A lightbox is a artist aid to help one tracing more easily. | |
| 3D Relief | Relief sculpture, in general, refers to a type of sculpture where the figures or forms project from a flat background, creating a sense of depth and three-dimensionality. | |
| Mixed media | Mixed media describes artwork in which more than one medium or material has been employed | |
| Graphite powder | Powdered graphite is the same graphite that pencil leads are made of, only ground into fine powder. You can “paint” it on paper with brushes to make watercolour-like “wash” effects, smooth textures, and cloudy backgrounds. | |
| Indian ink | Indian ink is a simple black or coloured ink once widely used for writing and printing and now more commonly used for drawing and outlining | |
| Surface textures | Textured surfaces can be created using a multiple of different materials, some may include thick layering of paint, also preparing the surface with poly filler, sand, PVA and tissue paper, newspaper and much more. | |
| Mount board | Mount board is a thin white, black or coloured card that artwork is placed inside for decorative purposes. Using an art frame mount presents artwork professionally, creating a clean and crisp finish. | |
| Water colour paper | Watercolour paper is a versatile surface which has a degree of absorbency that allows transparent colour to appear its most luminous. Watercolour paper is not only for use with watercolour paints – it can also be used for acrylics, gouache, pastels, pencils, graphite, charcoal, and it can also be primed for oil. | |
| Pastiche | Pastiche is an artistic work in a style that imitates that of another work, artist, or period. | |

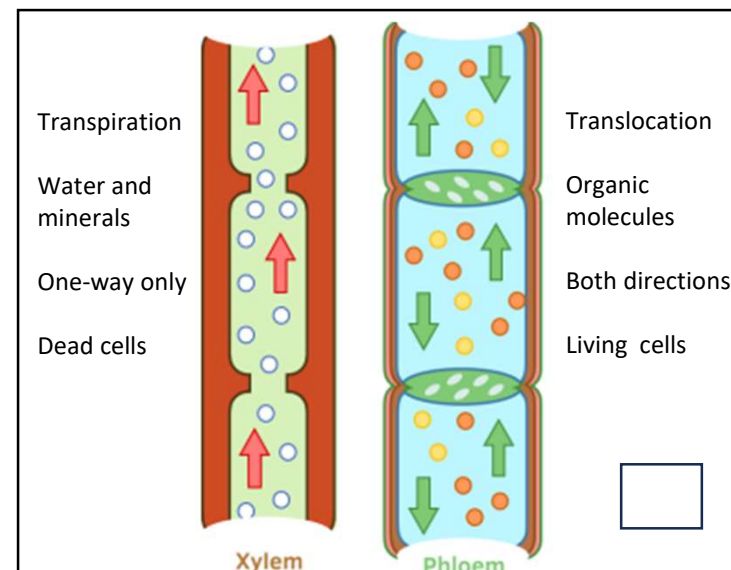


Parts of the leaf

| # | Structure | Function | ✓ |
|---|------------------------|---|---|
| 1 | Waxy cuticle | To reduce water loss | |
| 2 | Upper epidermis | Transparent to allow light to pass through | |
| 3 | Palisade cells | Contain many chloroplasts for photosynthesis | |
| 4 | Air spaces | Allow gases to diffuse easily | |
| 5 | Spongy mesophyll layer | Contains air spaces to allow gases to move through the leaf | |
| 6 | Stomata | Hole that allows gas exchange | |
| 7 | Lower epidermis | Where most stomata are found | |
| 8 | Guard cells | Cells that open and close stomata to allow gas exchange. | |

Transport through a plant

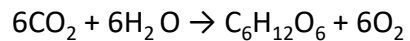
| Term | Definition | ✓ |
|---------------|--|---|
| Xylem | Hollow tubes, formed from the cell walls of dead cells, and strengthened by a substance called lignin. Site of water transportation in upward direction. | |
| Transpiration | The loss of water vapour from the leaves by evaporation from cells and then out through the stomata. | |
| Phloem | Hollow cells forming a tube to allow dissolved sugars to move between cells via translocation, in both directions. | |
| Translocation | The movement of dissolved sugars around the plant. | |



B4a Photosynthesis

Photosynthesis equations

Carbon dioxide + water → glucose + oxygen



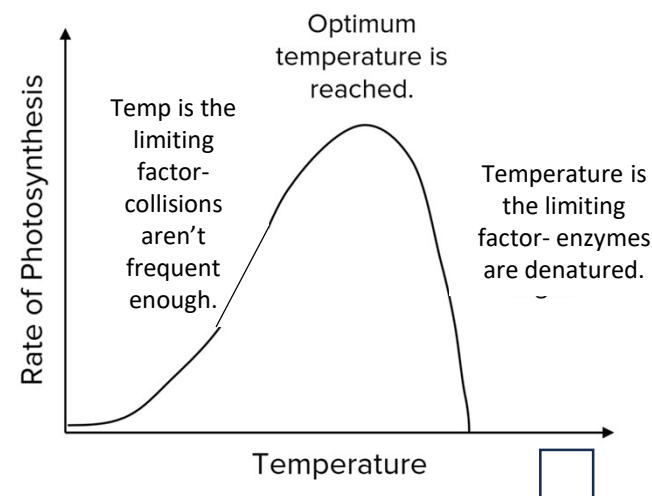
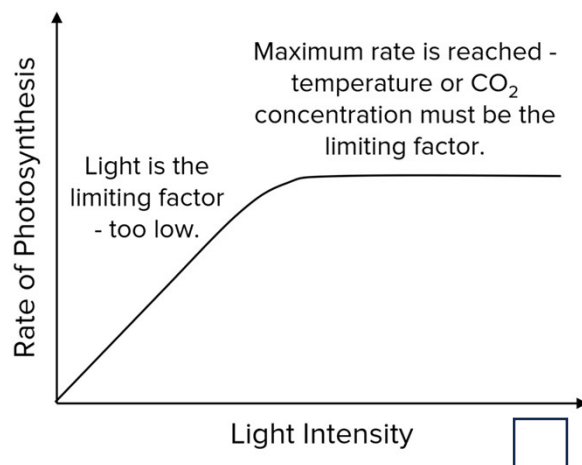
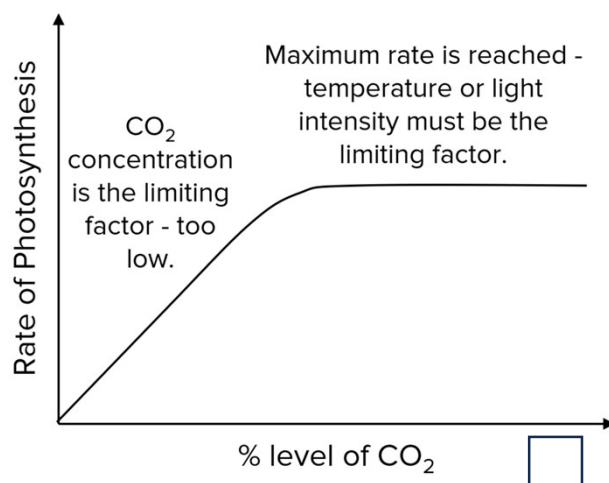
Limiting factors of photosynthesis

- | | Limiting factors of photosynthesis | ✓ |
|---|------------------------------------|---|
| 1 | Concentration of carbon dioxide | |
| 2 | Light intensity | |
| 3 | Temperature | |
| 4 | Amount of chlorophyll | |

Uses of glucose from photosynthesis

- | | Uses of glucose from photosynthesis | ✓ |
|---|---|---|
| 1 | Converted into insoluble starch for storage | |
| 2 | Use to produce fats and oils for storage | |
| 3 | Used to produce cellulose, which strengthens the cell wall | |
| 4 | Used to produce amino acids for protein synthesis (Nitrate ions absorbed from the soil are also needed) | |
| 5 | Used for respiration | |

In the limiting factor graphs, as the line of best fit increases, the factor on the x axis is the limiting factor. As the line of best fit plateaus, it is no longer a limiting factor and instead something else is limiting the rate of photosynthesis.



| Organisational Structures | | Appropriateness of organisational structures depends on: | | Centralisation and Decentralisation | |
|---|--|---|------------------------|--|--|
| Businesses have to organise themselves to be able to carry out their activities effectively. Employees will understand different job roles and responsibilities. There are four basic layers: | | <ol style="list-style-type: none"> Business size Skills of the workforce Management style Speed of decision making required Experience and skills of staff | | Centralisation | Decentralisation |
| 1. Directors | | The importance of motivation in the workforce | | All major decisions are made by one person or a few managers at the top of the hierarchy | The authority to make decisions is delegated. |
| 2. Managers | | Staff retention | Good customer service | Advantages: Control over key decisions Quick decision making | Advantages: Reduce pressure on senior managers Greater response to local markets |
| 3. Supervisors | | High productivity | Higher levels of sales | Disadvantages: Slower decision making Demotivating for subordinates | Disadvantages: Training may be required All employees must understand the aims of the organisation |
| 4. Operatives | | Improved recruitment and selection | | | |

| Definitions | | Methods of motivation | |
|-----------------|---|-----------------------|------------------------|
| Motivation | The will to complete a task | Financial | Non-Financial |
| Fringe benefits | Extra benefits that an employee may receive beyond their pay, for example a company car. | Salary | Fringe benefits |
| Salary | An annual payment to employees usually paid monthly. | Wage | Management style |
| Wage | Payment to employees calculated by how many hours they work. | Commission | Training |
| commission | Payment made to an employee based on a sale or goal | Profit sharing | Greater responsibility |
| Profit sharing | Where a percentage of the companies profit is divided between employees | | |
| Authoritarian | A management style where managers make decisions alone, without consulting staff | | |
| Democratic | A management style where managers allow the workforce some influence over decision making | | |
| Paternalistic | A management style where managers make decisions but only after consultation with staff | | |
| Laissez-faire | Managers allow workers to perform tasks as they see appropriate. | | |

| Definitions | |
|-------------------------------|---|
| Span of control | The number of employees managed directly by another employee |
| Chain of command | The line of authority within a business along which communication passes |
| Delaying | The removal of one or more levels of hierarchy from a business's organisational structure |
| Delegation | The passing down of authority to more junior employees |
| Flat organisational structure | Where an organisation has wide spans of control and few levels of hierarchy |
| Tall organisation structure | Where an organisation has narrow spans of control and a large number of levels of hierarchy |
| Organisational Structure | Is the way a business arranges itself to carry out its activities |
| Line manager | Is an employees immediate superior |

| The need for recruitment | |
|--|-------------------------------------|
| | <input checked="" type="checkbox"/> |
| Businesses need to recruit employees in a range of circumstances | |
| 1. Starting a new business | |
| 2. Increased production | |
| 3. Diversification and new skills required | |
| 4. Retirement | |
| 5. Promotion | |

| Methods of recruitment | |
|---|---|
| | <input checked="" type="checkbox"/> |
| Internal recruitment: Recruiting current employees into new roles | External recruitment: Recruiting staff from outside of the business |
| Advantages: 1. Quick 2. Experienced and familiar with the business | Advantages: 1. Bigger pool of candidates 2. New ideas |
| Disadvantages: 1. Few new ideas 2. Creates another vacancy | Disadvantages: 1. Expensive 2. Induction training required |

| Definitions | |
|----------------------|---|
| | <input checked="" type="checkbox"/> |
| Job Description | Document outlining the roles and responsibilities of a job. |
| Person Specification | Document outlining the skill and attributes required for a job. |
| Job Analysis | Collection and interpretation of information about a job |
| Zero hours contract | Allows an employer to hire staff without any guaranteed hours of work. |
| Short list | Selecting applicants for interview against the job description and person specification |
| Part time contract | Works for a proportion of the working below any hours less than 37hr per week. |
| Full time contract | Employment where you are required to work between 35-40hrs a week. |

| Contracts of employment | | |
|---|--|--|
| | | <input checked="" type="checkbox"/> |
| 1. Full time | 2. Part time | 3. Zero hours |
| Advantages: Attract high levels of applicants due to higher earning potential | Advantages: Save money if the business does not have 40hrs worth of work | Advantages: Allows flexibility of employment if fluctuations in demand |
| Disadvantages: Demand might not warrant 40hrs a week | Disadvantages: Hard to communicate | Disadvantages: Poor image |

| Main stages of recruitment | <input checked="" type="checkbox"/> |
|----------------------------|-------------------------------------|
| 1. Job Analysis | |
| 2. Job description | |
| 3. Person specification | |
| 4. Selection | |

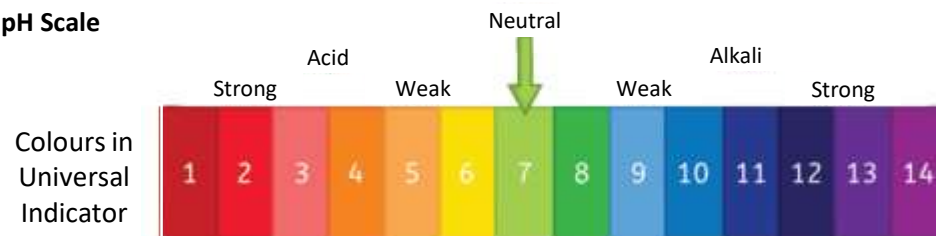
| Methods of selection | <input checked="" type="checkbox"/> |
|----------------------|-------------------------------------|
| 1. Interview | |
| 2. Skills tests | |
| 3. Group tests | |
| 4. Aptitude tests | |

| Benefits of effective recruitment & selection | <input checked="" type="checkbox"/> |
|---|-------------------------------------|
| 1. High productivity | |
| 2. high quality output | |
| 3. Staff retention | |
| 4. Good customer service | |

Chapter 4a – Chemical Changes

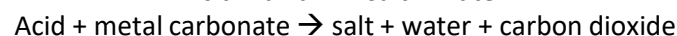
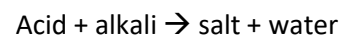
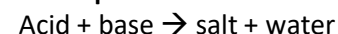
| Keyword | Learn | ✓ |
|-------------------------|---|---|
| Acid | Substance producing H^+ ions in water. Acids react with a base to form a salt | |
| Alkali | Soluble base (e.g. metal hydroxides) that produces OH^- ions in water. Bases react with an acid to form a salt | |
| Base | Substance that reacts with an acid to form a salt e.g. metal oxides | |
| Burette | Laboratory apparatus used to accurately measure a variable volume of solution | |
| Concentrated | A large number of solute particles per unit volume | |
| Concentration | Mass or number of particles of solute per unit volume (dm^3) | |
| Dilute | A small number of solute particles per unit volume | |
| Indicator | Substance that changes colour depending on the pH of a solution e.g. phenolphthalein, methyl orange, litmus | |
| Neutralisation reaction | Reaction in which an acid reacts with a base to form a neutral solution. Overall equation $H^+ + OH^- \rightarrow H_2O$ | |
| pH | Measure of concentration of H^+ ions relative to pure water. As pH decreases by 1, H^+ ion concentration increases by a factor of 10 | |
| Pipette | Laboratory apparatus that is used to accurately measure a fixed volume of solution | |
| Salt | Ionic compound formed by reaction of an acid with a base. Consists of a positive ion from the base and a negative ion from the acid | |
| Strong acid | One that is fully ionised in aqueous solution to release H^+ ions e.g. $HCl(aq) \rightarrow H^+(aq) + Cl^-(aq)$ | |
| Weak acid | One that is only partially ionised in aqueous solution to release H^+ ions e.g. $CH_3COOH(aq) \rightleftharpoons H^+(aq) + CH_3COO^-(aq)$ | |

pH Scale



| Indicators for titration | Colour in acid | Colour in alkali |
|--------------------------|----------------|------------------|
| Phenolphthalein | Colourless | Pink |
| Methyl orange | Red | Yellow |
| Litmus | Red | Blue |

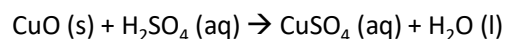
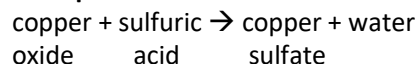
Neutralisation Reactions – general equations



Preparation of a Soluble Salt

- Add excess base to warm acid. Stir
- Filter solution to remove unreacted base.
- Transfer filtrate (solution of soluble salt) to an evaporating basin.
- Heat until crystals begin to form.
- Leave to cool and completely crystallise at room temperature.
- Pat crystals dry using paper towel.

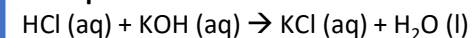
Example



Titration

- Fill a burette with acid. Note initial volume
- Transfer $25cm^3$ of alkali to a conical flask using a pipette.
- Add a few drops of indicator and place flask on a white tile
- Slowly add acid from the burette, swirling to mix, adding dropwise near the end point
- Stop as soon as indicator changes colour and note volume of acid added
- Repeat until concordant results are obtained ($\pm 0.1 cm^3$), then calculate mean volume of acid used

Example



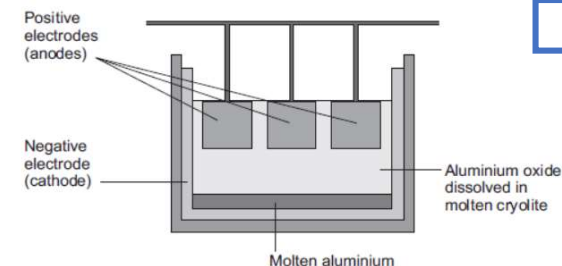
Chapter 4b – Chemical Changes

| Keyword | Learn | Tick |
|-----------------------|---|------|
| Displacement Reaction | A more reactive element displaces a less reactive element from a compound containing the less reactive element. | |
| Native metal | Unreactive metal found in the Earth's crust as the uncombined element. | |
| Ore | Rock containing enough of a metal to make it economically worthwhile to extract. | |
| Oxidation | Gain of oxygen / loss of electrons e.g. $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}^-$ | |
| Reduction | Loss of oxygen / gain of electrons e.g. $\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$ | |
| Electrolysis | The process of splitting up ionic compounds using electricity. | |

Extraction of Aluminium

Carbon electrode needs replacing as it reacts with the oxygen produced to form CO_2 .

Aluminium oxide is mixed with molten cryolite to reduce the melting point.



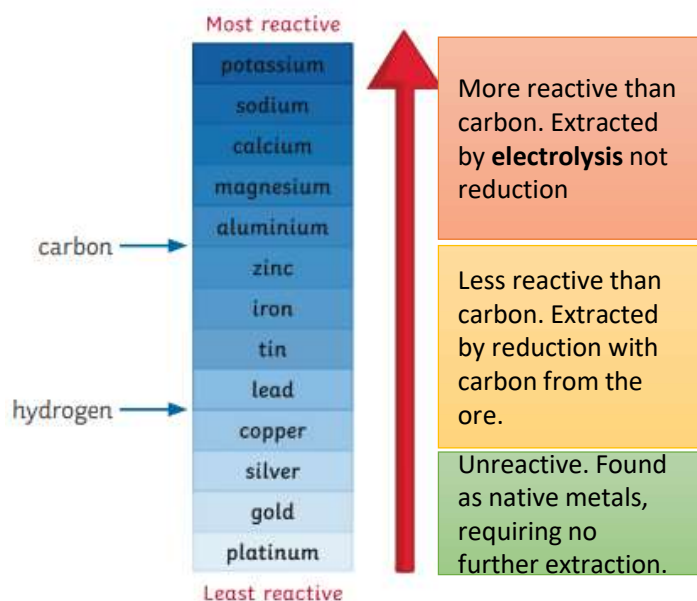
General Reactions of Metals

Metal + oxygen \rightarrow metal oxide

Metal + water \rightarrow metal hydroxide + hydrogen

Metal + acid \rightarrow salt + hydrogen

The Reactivity Series



Electrolysis

Ionic substances only conduct electricity when molten or in aqueous solution, as the ions are free to move and carry charge.

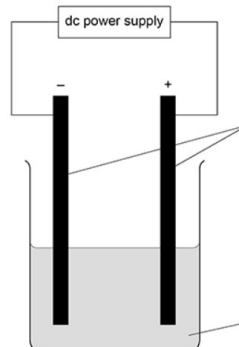
Positively charged ions are attracted to the negative electrode.

Negatively charged ions are attracted to the positive electrode.

This is because **opposite** charges **attract**.

When **positive** ions reach the negative electrode, they **gain** electrons: **reduction**.

When **negative** ions reach the positive electrode, they **lose** electrons: **oxidation**.



Molten ionic compounds e.g. PbBr_2 IONS PRESENT = Pb^{2+} Br^-
 REDUCTION at negative electrode - metal is discharged e.g. $\text{Pb}^{2+} + 2\text{e}^- \rightarrow \text{Pb}$
 OXIDATION at positive electrode - halogen gas is discharged e.g. $2\text{Br}^- \rightarrow \text{Br}_2 + 2\text{e}^-$

Aqueous ionic compounds e.g. NaCl IONS PRESENT = Na^+ Cl^- H^+ OH^-
 REDUCTION at negative electrode - metal or hydrogen gas is discharged - whichever is least reactive element e.g. $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$
 OXIDATION at positive electrode - halogen gas is discharged or oxygen gas if no halogen present e.g. $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$

2.1 Algorithms

| Keyword | Definition | ✓ |
|-----------------------------|--|---|
| Abstraction | Removing or hiding unnecessary details from a problem so that the important details can be focused on or more easily understood. | |
| Decomposition | Breaking a problem down into smaller sub-problems. | |
| Pattern Recognition | Looking for similarities among and within problems. | |
| Algorithmic thinking | Deciding on the order that instructions are carried out and identifying decisions that need to be made by the computer | |
| Flowchart | A graphical representation of an algorithm . | |
| Pseudocode | A textual, English-like method of describing an algorithm. | |

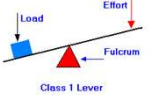
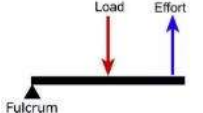
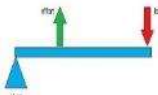
| | | | |
|--|--------------|---|--|
| | Line | An arrow represents control passing between the connected shapes. | |
| | Process | This shape represents something being performed or done. | |
| | Subroutine | This shape represents a subroutine call that will relate to separate, non-linked flowchart. | |
| | Input/output | This shape represents the input or output of something into or out of the flowchart. | |
| | Decision | This shape represents a decision (Yes/No or True/False) that results in two lines representing the different possible outcomes. | |
| | Terminal | This shape represents the 'Start' and 'End' of the process. | |

2.3 Producing Robust Programs

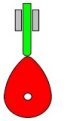
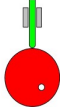
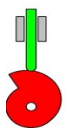
| Keyword | Definition | ✓ |
|-----------------------------|---|---|
| Robust program | A program that functions correctly under less than ideal conditions. | |
| Defensive design | Thinking about problems that could occur and preventing them before they happen. | |
| Authentication | Establishing a user's identity and ensuring only authorised users can gain access to a system. | |
| Validation | The process of checking data when it is entered to see if it conforms to a rule. | |
| Type check | Input is the correct data type. | |
| Range check | Input is inside the correct range. | |
| Presence check | To stop users leaving certain information empty. | |
| Length check | Input is of the correct length. | |
| Verification | Checking that data has been entered correctly. | |
| Sanitisation | Checks and modifies any input. | |
| Maintainable program | A program the original programmer has deliberately made straightforward to understand and modify. | |

GCSE Design Technology CORE 1.05 *part 2* Mechanical devices

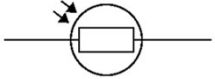

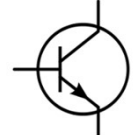

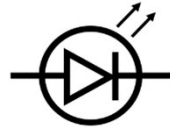

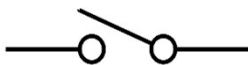
Levers

| Tick | Lever | Movement | Uses |
|------|---------|--|---|
| | Class 1 | A large input movement can produce a small output but with greater force. | <ul style="list-style-type: none"> Pliers Crowbars See-saws  |
| | Class 2 | A large input movement can produce a smaller output movement with greater force but the fulcrum is at 1 end. | <ul style="list-style-type: none"> Wheelbarrow Nut cracker  |
| | Class 3 | The force applied by the user is greater than the output force. | <ul style="list-style-type: none"> Tweezers Spade  |


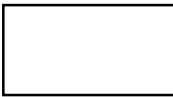
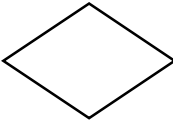
Cams

| Tick | Cam type | Motion type | Uses |
|------|---|--|--------------------------------|
| | Pear  | Motionless for half of the cycle then rises and falls in the 2 nd half. | Valves in a car engine |
| | Circular  | A continuous, smooth rise and fall. | Steam engines |
| | Snail  | A slow rise/stationary with a sudden drop. | Machines needing a sudden drop |

GCSE Design Technology: CORE 1.06 Electronic components

| Tick | Component | Symbol | Function |
|------|--------------------------------|---|---|
| | LDR (Light Dependent Resistor) |  | Light on LDR, the resistance changes. More light = less resistance; electricity flows. |
| | Thermistor |  | Resistance changes with temperature. Hot = low resistance cold = higher resistance. |
| | Transistor |  | Acts as a tiny electronic switch. It is known as a semi conductor. It can amplify small currents. |
| | Resistor |  | Changes the resistance to limit the flow of electricity through part of a circuit. |
| | LED (Light Emitting Diode) |  | Gives out light when electricity passes through. |
| | Buzzer |  | Makes a sound when electricity flows through. |
| | Switches |  | Turns the flow of electricity on in a circuit on or off. |

GCSE Design Technology: CORE 1.07 Programmable components

| Flowchart element | Definition/explanation | Tick |
|--|--|------|
| Programme | A set of instructions the system has been given to make the electronic system do what it is supposed to do. | |
| Flowcharts | Diagrams that are used to set up a programme. They take information from input devices and act in particular ways to control output devices. | |
|  | These are the boxes used in flowcharts for the 'start' and 'end' sections only. | |
|  | These are the shapes used for instructing on a flowchart. | |
|  | These are the shapes used on a flowchart when a decision needs to be made. These are followed by yes and no answers. | |
| Time delay | These are sections of a programme which ask it to wait for 'x' amount of time before moving onto the next instruction. | |
| Count | When a programme is either told to count how many times it gets an input before moving onto the next instruction or it is told to loop an action 'x' amount of times before moving on. | |
| Feedback loop | When a programme is sent back to an earlier stage in the flowchart, this is usually set by a sensor and will follow from a decision box. | |

GCSE Design Technology: CORE 1.08 Metals

| Tick | Non-ferrous metal | Properties | Uses |
|------|-------------------|---|--|
| | Aluminium | <ul style="list-style-type: none"> Corrosion resistant Easily machined Good heat/electrical conductor Malleable | <ul style="list-style-type: none"> Aircraft parts Window frames Engine parts Drinks cans |
| | Copper | <ul style="list-style-type: none"> Corrosion resistant Ductile Easily machined Excellent heat/electrical conductor | <ul style="list-style-type: none"> Electrical wire/components Gas and water pipes Printed circuits |
| | Brass | <ul style="list-style-type: none"> Corrosion resistant Easily machined Good heat/electrical conductivity Casts well | <ul style="list-style-type: none"> Plumbing fittings Door fittings Locks Musical instruments |

| Tick | Ferrous metal | Properties | Uses |
|------|-----------------|---|--|
| | Mild steel | <ul style="list-style-type: none"> Ductile Malleable Magnetic High tensile strength | <ul style="list-style-type: none"> Screws, nails, bolts Car body panels, General engineering purposes |
| | Stainless steel | <ul style="list-style-type: none"> Corrosion resistant Hard Resists wear Difficult to cut | <ul style="list-style-type: none"> Kitchenware Sinks Cutlery Medical equipment |
| | Cast iron | <ul style="list-style-type: none"> Hard 'skin' Soft core Magnetic Good compression strength | <ul style="list-style-type: none"> Machine Parts Vices Break discs Manhole covers |



| Steps to analysing an unseen poem-WILSON | | | | ✓ | Language | | ✓ | Structure and form | | ✓ |
|--|--|---|--|-------------------|--|--|---|---|--|---|
| First | Read the question carefully and highlight the key words. Read the poem twice. Make sure you understand what it is about (use the question to help you). Poems are usually about a person, a place, event, memory or reflection (thinking of feelings about something). They are often observations of very small details. | | | | Assonance: repeated vowel sound. | | | Anaphora: repeated first words at start of a line. | | |
| | | | | | Extended metaphor: a series of linked metaphors. | | | Blank verse: poetry written with a consistent metre (usually iambic pentameter) but unrhymed lines. | | |
| | W What is it about? Who is speaking? Where are they? What happens and why? When is the poem set at a particular time? Analyse: feelings, characters, speaker, your reaction. | | | | Imagery: visually descriptive or figurative language. | | | Caesura: a break in the middle of a line using punctuation. | | |
| | I Ideas – what ideas or themes does the poet explore? | | | | Motif: recurring theme or symbol. | | | Enjambment: a sentence that runs over lines and stanzas. | | |
| L | Language – are there any specific words or language techniques? | | | | Semantic field: group of words related in meaning. | | | Free Verse: Does not use consistent meter patterns, rhyme, or any musical pattern. | | |
| S | Structure – how is the poem laid out and organised? Does it flow? Is there a story (narrative)? Does it have a timeline? Are there any structural devices you can pick out? | | | | | | | Iambic pentameter: 10 syllables per line, consisting of unstressed/stressed patterns. | | |
| O | Opinion – why do you think the poet wrote it? Is there a message? | | | | | | | Juxtaposition: placing contrasting ideas close together in a text. | | |
| N | Now plan – plan your answer so it is clearly structured. | | | | | | | Oxymoron: two opposite words next to another. | | |
| You must write paragraphs which have a clear point, quotations and analysis of how and why methods convey meaning. In your analysis you must consider the effect on the reader and the poet’s intention. - For the 24 mark question aim for 4-5 paragraphs. For the 8 mark question aim for 2-3 paragraphs. | | | | | Useful words for analysis | | ✓ | Quatrain: a stanza of four lines. | | |
| | | | | | Suggests | | | Refrain: repeated lines (like a chorus in a song). | | |
| | | | | | Symbolises | | | Sonnet: 14 lines. It usually takes a turn, called a “Volta,” about 8 lines in, and then resolves the issue by the end. Shakespearean sonnets-ABAB CDCD EFEF GG | | |
| | | | | | Alludes to | | | Sestet: stanza of 8 lines | | |
| | | | | | Implies | | | Volta: the turning point of a poem. | | |
| Comparatives | | ✓ | | | Highlights | | | | | |
| Moreover | | | | Conversely | Signifies | | | | | |
| In addition | | | | Alternatively | Conveys | | | | | |
| Similarly | | | | On the other hand | Embodies | | | | | |
| In contrast | | | | Conversely | Connotes | | | | | |



| Poem | Summary | Quotes | ✓ | Glossary | ✓ |
|--------------------------------------|--|---|---|--|---|
| Ozymandias- Shelley | The broken statue of a once-great Pharaoh acts a symbol for the impermanence of man's power, compared to nature. | "My name is Ozymandias, Kind of Kings" "Round the decay of that colossal wreck" | | Idiomatic – (Adj) Using, containing, or denoting expressions that are natural to a native speaker | |
| London- Blake | A man wanders the streets of London, witnessing the suffering of the working classes. | "the mind forged manacles" "the chimney-sweeper's cry, every black'ning church appals" | | | |
| Extract from The Prelude- Wordsworth | A young man steals a boat, only to be humbled by nature's power as an unseen mountain towers over him. | "my boat went heaving through the water like a swan" "A huge peak, black and huge [...] upreared its head" | | Guajarati – (N) Language spoken in Gujarat (a state in Western India) | |
| My Last Duchess- Browning | An arrogant duke shows a guest a painting of his last wife; he hints that he had her murdered as she displeased him. | "That's my last Duchess painted on the wall" "I gave commands then all smiles stopped" | | Quickdraw – (N) Relates to a dual | |
| CotLB- Tennyson | 600 soldiers bravely carry out a miscommunicated order. The charge is a failure, but their heroism is remembered. | "Half a league, half a league, half a league onward" "Into the valley of death rode the six hundred" | | Vindictive – (Adj) Having/showing strong or unreasoning desire for revenge | |
| Exposure- Owen | A group of soldiers in the trenches of WW1 suffer the appalling conditions and exposure to the cold. | "Our brains ache in the merciless iced east winds that knife us" "Dawn massing in the East her melancholy army" | | | |
| Storm on The Island- Heaney | A rural island community is swept over by a terrible storm. The storm can act as an extended metaphor for the troubles in Ireland. | The sea "spits like a tame cat turned savage" "wind dives and strafes invisibly. Space is a salvo." | | Ponte Vecchio – Arch bridge located in The Arno, Florence, Italy | |
| Bayonet Charge- Hughes | A soldier is overcome with terror, going over the top during WW1. | "suddenly he awoke and was running" "in what cold clockwork of the stars and the nations was he the hand pointing that second?" | | Parabola – A curve that is mirror symmetrical | |
| Remains- Armitage | A soldier shoots a looter while on patrol and is haunted by PTSD and feelings of guilt. | "his blood shadow stays on the street" "he's here in my head when I close my eyes, dug in behind enemy lines". | | Plumb – Refers to being entirely vertical | |
| Poppies – Weir | A mother grieves as she sees her son go off to war, remembering the boy he once was. | "released a songbird from its cage" "hoping to hear your playground voice catching on the wind" | | Diverged – Go in different directions | |
| War Photographer- Duffy | A photographer suffers from feelings of depression and isolation after reporting on conflict around the world. | "In his darkroom he is finally alone" "A stranger's features faintly start to twist before his eyes, a half formed ghost" | | Indecisive – (Adj) Not able to make decisions quickly or easily | |
| Tissue- Dharker | Paper is used as an extended metaphor for the strength and fragility of the things which make up our lives: faith, finance, culture, cities etc. | "Paper that lets the light shine through" "Maps too. The sun shines through their borderlines" | | Hesitant – (Adj) Unsure or slow in acting or speaking | |
| The Émigrée- Rumens | A girl, displaced from her home country struggles with conflicted feelings for her old/new homes. | "my original view, the bright, filled paperweight" "I am branded by an impression of sunlight" | | Arbitrary – (Adj) Based on random choice or personal whim, rather than any reason or system | |
| Checking Out Me History- Agard | The narrator explores the figures cut out of history by Eurocentric, whitewashed accounts of the world. He reclaims his cultural history. | "Dem tell me Wha dem want to tell me" "now I checking out me own history, I carving out me identity" | | | |
| Kamikaze – Garland | A daughter looks back on how her father failed to carry out his mission as a WW2 kamikaze pilot, suffering disgrace for his choice. | "her father embarked at sunrise" "sometimes, she said, he must have wondered which had been the better way to die" | | Seraphim – (N) Angel | |

Name:

Food science

Date:

Functions of ingredients

Ingredients provide a variety of functions in recipes.- Coating, Binding, Glazing, Thickening, Emulsifying, Gelatinising.

Carbohydrate, protein and fat

Carbohydrate, protein and fat all have a range of properties that make them useful in a variety of food products.

Carbohydrates perform different functions in food.

They can:

- help to cause the colour change of bread, toast and bakery products (dextrinisation);
- contribute to the chewiness, colour and sweet flavour of caramel;
- thicken products such as sauces and custards (gelatinisation).

Maillard reaction

Foods which are baked, grilled or roasted undergo colour, odour and flavour changes. This is primarily due to a group of reactions involving amino acids (from protein) and reducing sugars.

Dextrinisation

When foods containing starch are heated they can also produce brown compounds due to dextrinisation. Dextrinisation occurs when the heat breaks the large starch polysaccharides into smaller molecules known as dextrins which produce a brown colour.

Caramelisation

When sucrose (table sugar) is heated above its melting point it undergoes physical and chemical changes to produce caramel.

Shortening- When fat is used in making rubbed in mixtures such as pastry, biscuits, scones and cakes, it coats the grains of flour this gives it a waterproof coating and prevents the gluten in it from developing. This means the finished product will have a short crumbly texture.

Gelatinisation

When starch is mixed with water and heated, the starch granules swell and eventually rupture, absorbing liquid, which thickens the mixture. On cooling, if enough starch is used, a gel forms.

Proteins perform different functions in food products.

They:

- aerate foods, e.g. whisking egg whites;
- thicken sauces, e.g. egg custard;
- bind ingredients together, e.g. fishcakes;
- form structures, e.g. gluten formation in bread;
- gel, e.g. lime jelly.

Gluten formation

Two proteins, gliadin and glutenin, found in wheat flour, form gluten when mixed with water. Gluten is strong, elastic and forms a 3D network in dough. In the production of bread, kneading helps untangle the gluten strands and align them. Gluten helps give structure to the bread and keeps in the gases that expand during cooking.

Gelation

Gelatine is a protein which is extracted from collagen, present in animal connective tissue. When it is mixed with warm water, the gelatine protein molecules start to unwind. On cooling, a stable, solid network is formed, trapping the liquid.

Denaturation

Denaturation is the change in structure of protein molecules. The process results in the unfolding of the protein's structure. Factors which contribute to denaturation are heat, salts, pH and mechanical action.

Emulsions- An emulsion is formed when oil and liquid are mixed together, such as in a salad dressing. Often when oil and salad are mixed together they will separate when left to stand- this happens with salad dressings. An emulsifier is sometimes added to these ingredients to prevent them from separating, for example, egg yolk which contains Lecithin is used in some dressings, mayonnaise and low-fat spreads.

Coagulation

Coagulation follows denaturation. For example, when egg white is cooked it changes colour and becomes firmer (sets). The heat causes egg proteins to unfold from their coiled state and form a solid, stable network.

Aeration

Products such as creamed cakes need air incorporated into the mixture in order to give a well-risen texture. This is achieved by creaming a fat, such as butter or baking spread, with sugar. Small bubbles of air are incorporated and form a stable foam. When egg whites are whisked the protein in them Albumin is stretched and traps air, for example when eggs are whisked to make meringues.

Fats performs different functions in food.

They help to:

- add 'shortness' or 'flakiness' to foods, e.g. shortbread, pastry;
- provide a range of textures and cooking mediums;
- glaze foods, e.g. butter on carrots;
- aerate mixtures, e.g. a creamed cake mix;
- add a range of flavours.

Plasticity

Fats do not melt at fixed temperatures, but over a range. This property is called plasticity.

Colloidal systems

Colloidal systems give structure, texture and mouthfeel to many different products.

| System | Disperse phase | Continuous phase | Food |
|----------------|----------------|------------------|---------------|
| Sol | Solid | Liquid | Unset jelly |
| Gel | Liquid | Solid | Jelly |
| Emulsion | Liquid | Liquid | Mayonnaise |
| Solid emulsion | Liquid | Solid | Butter |
| Foam | Gas | Liquid | Whipped cream |
| Solid foam | Gas | Solid | Meringue |

Raising agents

Raising agents include anything that causes rising within foods, and are usually used in baked goods. Raising agents can be:

- biological, e.g. yeast;
- chemical, e.g. baking powder; Bicarbonate of Soda
- mechanical, e.g. adding air through beating or folding.

Functional ingredients

These are ingredients that are specifically included in food for additional health benefits. They include:

- probiotics – 'good' bacteria that may have a positive impact on human health;
- prebiotics – food ingredients that promote the growth of beneficial microorganisms in the gut;
- sterols/stanols – compounds that can lower cholesterol;
- healthy fats (e.g. omega-3);
- added vitamins and minerals (more than in the original food).

Why is food prepared and cooked?

Food is prepared and cooked

- make the food more palatable – improves flavour, texture and appearance;
 - reduce the bulk of the food;
 - provide variety and interest to meals.
- . Have hot food on cold days.

Methods of cooking food

The methods of cooking are divided up into groups. These are based on the cooking medium used. They are:

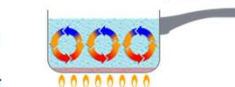
- moist/liquid methods, e.g. boiling;
- dry methods, e.g. grilling;
- fat-based, e.g. frying.

Selecting the most appropriate way of preparing and cooking certain foods is important to maintain or enhance their nutritional value.

- Vitamins can be lost due to oxidation during preparation or leaching into the cooking liquid.
- Fat-based methods of cooking increase the energy (calories) of the food.
- The use of different cooking methods affects the sensory qualities of the food.

There are three ways that heat is transferred to food.

- Conduction – the exchange of heat by direct contact with foods on a surface.
- Radiation – energy in the form of rays.
- Convection – currents of hot air or hot liquid transfer the heat energy to the food.



Key terms

Conduction: The exchange of heat by direct contact with foods on a surface.

Convection: Currents of hot air or hot liquid transfer the heat energy to the food.

Functional ingredients: Included in food for additional health benefits.

Heat transfer: Transference of heat energy between objects.

Radiation: Energy in the form of rays.

Tenderisation

- Mechanical tenderisation – a meat cleaver or meat hammer may be used to beat the meat. Cutting into small cubes or mincing can also help.
- Chemical tenderisation (marinating) –the addition of any liquid to flavour or soften meat before cooking.

| Les Jeux de la Francophonie | |
|------------------------------|--------------------|
| pratiquer | to practise |
| être prêt à | to be ready to |
| être fier | to be proud |
| l'entraînement | training |
| gagner | to win |
| perdre | to lose |
| une piste | a track |
| courir | to run |
| chaque jour | each/every day |
| pour la première fois | for the first time |
| un pays | a country |
| passer | to spend |
| la Francophonie | The French World |

| Qu'est-ce que tu as fait? | |
|-------------------------------|--------------------|
| tout/toute/tous/toutes | all |
| gratuit | free |
| d'abord | firstly |
| jeune | young |
| le rythme | the rhythm |
| les paroles | the lyrics |
| beaucoup de monde | lots of people |
| rien | nothing |
| ensuite | next |
| puis | then |
| plus tard | later |
| il y a/ il y avait | there is/there was |
| c'est / c'était | it is / it was |
| quel dommage! | what a shame! |
| finalement | finally |
| un week-end parfait | a perfect weekend |

| Possessive adjectives | | | |
|-----------------------|------------|------------|------------|
| | my | your | his/her |
| masc | mon | ton | son |
| fem | ma | ta | sa |
| plural | mes | tes | ses |

| Dans ma famille | |
|--|--------------------------------|
| il y a .. personnes | there are...people |
| ma mère | my mum |
| mon père | my dad |
| un frère | a brother |
| un beau-père | a step-father |
| une belle-mère | a step-mother |
| un demi-frère | a half brother |
| une demi-sœur | a half sister |
| un enfant unique | an only child |
| un oncle | an uncle |
| une tante | an aunt |
| un grand-père | a grandfather |
| une grand-mère | a grandmother |
| les grand-parents | grandparents |
| il a.... ans/ ils ont...ans | he is/they are ...years old |
| un mari | a husband |
| une femme | a wife |
| un fils | a son |
| une fille | a daughter/girl |
| jumeau(x) | twin (m) |
| jumelle(s) | twin (f) |

G Adjectival agreement

> Page 224

Most adjectives work like this:

| masculine | feminine | masc plural | fem plural |
|-----------------------------------|---------------------------------|---------------------------------|-----------------------------------|
| no ending e.g. <i>charmant</i> | add -e e.g. <i>charmante</i> | add -s e.g. <i>charmants</i> | add -es e.g. <i>charmantes</i> |

| La personnalité | |
|-------------------------|--------------|
| agaçant(e) | annoying |
| bavard(e) | chatty |
| heureux/heureuse | happy |
| jeune | young |
| gentil/gentille | kind |
| sympa/agréable | nice |
| fidèle | loyal |
| Aîné(e) | older |
| Étonnant(e) | astounding |
| fier/fière | proud |
| handicapé(e) | disabled |
| paresseux/euse | lazy |
| occupé/occupée | busy |
| pénible | annoying |
| pareille | equal |
| sérieux/sérieuse | serious |
| travailleur/euse | hard-working |
| tranquille | quiet |
| vieux/vieille | old |
| Triste | sad |

Reflexive verbs

Reflexive verbs are mostly verbs to do with daily routine or relationships. The reflexive pronoun is added before the conjugated verb and usually means 'self' eg I get myself dressed, I wash myself.

| | | |
|-------------------------|-----------------|--|
| Se laver | To get washed | |
| Je me lave | I get washed | |
| Tu te laves | You get washed | |
| Il se lave | He gets washed | |
| Elle se lave | She gets washed | |
| On se lave | We get washed | |
| Nous nous lavons | We get washed | |
| Vous vous lavez | You get washed | |
| Ils se lavent | They get washed | |
| Elles se lavent | They get washed | |

Other common reflexive verbs

| | | |
|--------------------|------------------|--|
| se lever | to get up | |
| s'habiller | to get dressed | |
| se doucher | to have a shower | |
| se coucher | to go to bed | |
| s'amuser | to have fun | |
| s'ennuyer | to get bored | |
| se préparer | to get ready | |
| se disputer | to argue | |
| s'occuper | to look after | |

| S'entendre avec quelqu'un | To get on with someone | |
|-----------------------------------|------------------------|--|
| je m'entends avec | I get on with | |
| tu t'entends avec | you get on with | |
| il/elle s'entend avec | he/she gets on with | |
| nous nous entendons avec | we get on with | |
| vous vous entendez avec | you get on with | |
| ils/elles s'entendent avec | they get on with | |

Les rapports – relationships

| | | |
|----------------------------|--------------------|--|
| un allié | an ally | |
| moi-même | myself | |
| un ami/un copain | a friend (m) | |
| une amie/une copine | a friend (f) | |
| mon meilleur ami | my best friend (m) | |
| ma meilleure amie | my best friend (f) | |
| toujours | always | |
| encourager | to encourage | |
| d'habitude | usually | |
| parfois | sometimes | |
| rarement | rarely | |
| lui/elle | him/her | |
| sauf | except | |
| les autres | the others | |
| ensemble | together | |
| la confiance | trust | |
| partager | to share | |
| l'amitié | friendship | |
| l'amour | love | |
| l'esprit | spirit/mind | |

To form the past tense of regular verbs:
Use a form of avoir/être and the past participle
past participles of -er verbs end in é
of -ir verbs end in i
of -re verbs end in u

Past tense common I form verbs

| | | |
|--------------------------------|-------------------|--|
| Je suis allé | I went | |
| Je suis resté | I stayed | |
| Je suis sorti | I went out | |
| J'ai mangé | I ate | |
| J'ai retrouvé | I met | |
| J'ai lu | I read | |
| J'ai fait une promenade | I went for a walk | |
| J'ai acheté | I bought | |
| J'ai quitté la maison | I left the house | |
| J'ai vu | I saw | |
| J'ai bu | I drank | |
| J'ai pris | I took | |

Past tense we form verbs

| | | |
|---------------------------|-------------|--|
| nous sommes allés | we went | |
| nous sommes restés | we stayed | |
| nous sommes sortis | we went out | |
| nous avons pris | we took | |
| nous avons visité | we visited | |
| nous avons mangé | we ate | |
| nous avons bu | we drank | |
| nous avons acheté | we bought | |

Present tense regular ER verb endings. Remove the ER and add the following endings. For example Regarder= To watch

| | | |
|-------------------|------|--------------------|
| je | -e | je regarde |
| tu | -es | tu regardes |
| il/elle/on | -e | il/elle/on regarde |
| nous | -ons | nous regardons |
| vous | -ez | vous regardez |
| ils/elles | -ent | ils regardent |



3.1 The world is becoming increasingly urbanised. ☐

- **Urbanisation** is the rise in the percentage of people living in urban areas. In 2007, for the first time, more people lived in urban areas than rural:
- Africa and Asia are expected to see the biggest rises in the next century.
- Most of the world's largest cities are now in emerging countries.
- The causes of this growth are:
 1. **rural-urban migration**
 2. **natural increase** (higher birth rate than death rate).
- **Megacities** have over 10 million people. Increasing numbers of megacities are in emerging countries (e.g. Mumbai).
- **World cities** have a big influence on global politics and decision-making. Some world cities play an unequal role in world affairs. They have **urban primacy** – meaning they have an importance and bigger influence than their size suggests (e.g. London).

3.2 Urbanisation is a result of socio-economic processes and change. ☐

- One cause of urbanisation is economic growth, which creates new jobs, leading to migration.
- New York's **knowledge economy** attracts **international migrants**.
- Some cities experience population decline. **De-industrialisation** has led to population decline in Detroit.
- The **informal economy** in developing countries is often large. Millions of people sell goods or offer services on the street (e.g. selling fruit). The **formal economy** grows slowly as many people are subsistence farmers.
- India's informal economy is huge. Much of India's informal economy is in **factories and construction**, where there are few regulations.
- New York's knowledge economy (e.g. **software and financial services**) is the most valuable part of its economy. However, the informal economy still contributes to its GDP, mostly in the catering industry.

3.3 Cities change over time and this is reflected in changing land use. ☐

Generally, there are 5 processes associated with urbanisation:

1. **Urbanisation** – people move into the area
2. **Suburbanisation** where the city grows outwards from its central core to sprawl or spread out into the surrounding environment. Best location is rural-urban fringe, leading to urban sprawl.
3. A period of decline in either population or industry during **counter-urbanisation**, where people move out of the area due to push factors.
4. Urban **regeneration** (improvements in the area) lead to **re-urbanisation**, where people move back in to the urban area.

Land use in cities is usually in a pattern. The three types of land use are:

- Commercial – mostly in the **CBD** (central business district). The most accessible and expensive part of the city.
- Industrial – either found in the **inner city** (older) or on the city edge (newer).
- Residential – older properties are found closer to the centre (19th century **terraced** housing). 20th century **semi-detached** and **detached** housing are found towards the **suburbs**.

Urban land use is influenced by:

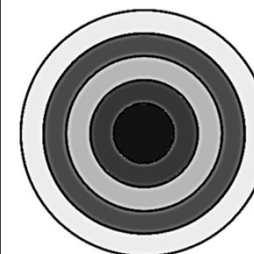
- Accessibility
- Availability
- Cost
- Planning regulation.

Land use models: Burgess and Hoyt.

Mumbai ☐

Mumbai is a megacity, India's main commercial city, and world city. Mumbai is:

- on an estuary, where its **port** grew
- well-connected owing to its port on the west coast (closer to Europe) and by air, only 9-hours from the UK
- not typical of developing cities – the CBD is near the island tip surrounded by unequal residential areas.
- Mumbai's structure loosely follows that of developing cities.
- **High quality housing** is found in the **inner city** close to the CBD that only the wealthy can afford.
- **Low-income poor quality** (permanent housing) **surrounds the inner city**.
- Spontaneous (**informal**) squatter settlements **spreads outwards** as rural-urban migrants arrive and build on what land is available.

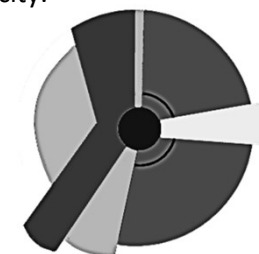


← Burgess

This model is based on the idea that land values are highest in the centre of a town or city.

Hoyt →

Similar to Burgess, but includes 'wedges' of industry.



| Einladungen - Invitations | | |
|--|--|--|
| Möchtest du/ Willst dusehen | Would you like/do you want to see | |
| einen Film | a film | |
| eine Ausstellung | an exhibition | |
| eine Vorstellung | a performance | |
| Möchtest du/ Willst dugehen | Would you like/do you want to go ... | |
| auf das (aufs) Konzert | to the concert | |
| ins Theater/Kino | to the theatre/cinema | |
| Möchtest du/Willst du Fußball spielen? | Would you like/do you want to play football? | |
| Ja, gerne! | Yes, gladly/I'd like to. | |
| Vielleicht. | Perhaps. | |
| Nein, danke. | No, thank you. | |
| Ich darf nicht. | I am not allowed. | |
| Es tut mir (wirklich) leid. | I'm (really) sorry. | |
| Ich habe keine Lust | I don't feel like it. | |

| Rollenspiel – role play | | |
|--|---|--|
| Ich möchte eine Karte/ Karten kaufen, bitte. | I would like to buy a ticket/tickets, please. | |
| Was kostet das? | How much does it cost? | |
| Wo ist das Café/ Restaurant? | Where is the café/restaurant? | |
| Wie ist das Essen? | How is the food? | |
| Können Sie ... empfehlen? | Can you recommend ...? | |
| Wann/Um wie viel Uhr beginnt / endet? | When/At what time does ... start/finish? | |
| Wann/Um wie viel Uhr öffnet/schließt? | When/At what time does ... open/close? | |
| das Museum | the museum | |
| Gibt es hier (in der Nähe) ...? | Is there/Are there ... nearby? | |
| Toiletten | toilets | |

| Film und Fernsehen | | |
|-----------------------|---------------------------------|--|
| die Nachrichten | the news | |
| die Sportsendung(en) | sports programme(s) | |
| der Film(e) | the film(s) | |
| die Serie(n) | series | |
| der Krimi(s) | crime programme(s)/ thriller(s) | |
| die Komödie(n) | comedy/(ies) | |
| der Dokumentarfilm(e) | documentary/(ies) | |
| die Sendung(en) | programme(s) | |

| Wie war der Film? How was the film? | | |
|-------------------------------------|-------------------------------|--|
| Es gab/der Film hatte.... | There was/the film had | |
|keinen/keine/kein | no/not any | |
| ...(zu) viel/wenig | (too) much/little | |
| (die) Gewalt/ Spannung/ Stimmung | violence/suspense/ atmosphere | |
| Der Film war | The film was | |
| Die Schauspieler (innen) waren | The actors were | |
| ein bisschen/ total/ völlig | a bit/totally/ completely | |
| kompliziert | complicated | |
| schwach | weak | |
| traurig/lustig | sad/funny | |
| super/toll | super/great/terrific | |
| lang | long | |
| Im Film ging es um ... | The film was about ... | |
| einen Schüler/eine Schülerin | a student/pupil | |
| eine Familie | a family | |
| eine Reise | a trip | |

| (fern)sehen – to see/watch (TV) | | |
|---|-----------------------------|--|
| ich sehe ... (fern) | I watch (TV) | |
| du siehst ... (fern) | you watch (TV) | |
| er/sie/es sieht ... (fern) | he/she/it watches (TV) | |
| wir sehen ... (fern) | we watch (TV) | |
| ihr seht ... (fern) | you all watch (TV) | |
| Sie/sie sehen ... (fern) | you (form) /they watch (TV) | |
| This is a strong verb – vowel changes in the du & er/sie/es forms | | |

| Picture description | | |
|---|-----------------------------------|--|
| Im Bild/Im Foto | On the photo | |
| Ich/Man kann ... sehen | I can see/You can see | |
| Im Bild gibt es | In the picture there is | |
| Auf der linken/ rechten Seite | On the left/on the right | |
| Im Hintergrund (V2) | In the background | |
| Im Vordergrund (V2) | In the foreground | |
| In der Mitte ... | In the middle | |
| Sie spielen, essen , tragen | They are playing, eating, wearing | |
| USE PRESENT TENSE TO SAY WHAT PEOPLE ARE DOING – “AM-ING”, “NO IS-ING” OR “ARE-ING” | | |

| Was wirst du am Wochenende machen? What will you do at the weekend? | | |
|---|-----------------------|--|
| Ich werde ... | I will ... | |
| (Bücher) lesen | read (books) | |
| (soziale) Medien benutzen | use (social media) | |
| (Videos) hochladen | upload (videos) | |
| später | later | |
| heute Nachmittag | this afternoon | |
| heute Abend | this evening | |
| heute Nacht | tonight | |
| morgen (früh) | tomorrow (morning) | |
| nächsten Samstag | next Saturday | |
| nächstes Wochenende | next weekend | |
| allein | alone | |
| mit meinem Freund/ meiner Freundin | with my friend | |
| mit meinen Freunden/Freundinnen | with my friends | |
| mit meiner Familie | with my family | |
| am Strand | at the beach | |
| im Park | in the park | |
| in der Stadt(mitte) | in the town (centre) | |
| in ... | in ... | |
| zu Hause | at home | |
| Wie wird das sein? What will it/that be like? | | |
| Das wird ... sein | It/that will be | |
| Ich werde das ... finden | I will find it | |
| ermüdend | tiring | |
| fantastisch | fantastic | |
| schlecht | bad | |

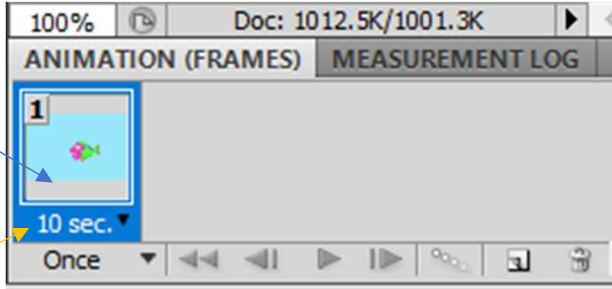
| The future tense: use “werden” + an infinitive at the end. | | |
|---|---|--|
| ich werde machen | | |
| du wirst machen | | |
| er/sie/es wird machen | | |
| wir werden machen | | |
| ihr werdet machen | | |
| Sie/sie werden machen | | |
| NB The future tense translates to I will do or I am going to do | | |
| To talk about actions in the past, use the perfect tense. You need a form of haben or sein (for movement verbs) plus a past participle (ge + verb stem + t) | | |
| Ich habe/er, sie hat/wir haben gespielt/gelernt/gehört/ gekauft/getanzt | I/he, she/we played/learnt/ listened/bought danced | |
| some past participles are irregular getragen/ gesehen (ferngesehen) /hochgeladen/ heruntergeladen | wore/saw/ watched TV/ uploaded/ downloaded | |
| Ich bin/er, sie ist/wir sind gefahren/gegangen | I/he, she/we travelled/went | |
| Three key verbs are often used in the imperfect to DESCRIBE things in the past | | |
| Ich/es war | I/it was | |
| Ich/es hatte | I/it had | |
| Es gab | There was | |
| Die Musik war spitze/klasse! – the music was amazing Es gab keine Schlange– there was no queue Es war das Gelbe vom Ei – it was the bees knees. | | |

| Sequencers + Time phrases | | |
|---------------------------------------|-------------------------------------|--|
| danach | afterwards | |
| dann | then | |
| nachdem | after | |
| zuerst | firstly/first of all | |
| schließlich | finally | |
| oft | often | |
| selten | seldom | |
| am Wochenende | at the weekend | |
| Meinungen - opinions | | |
| Meiner Meinung nach (V2) | In my opinion | |
| Ich finde/fand | I find/found | |
| Ich denke/dachte | I think/thought | |
| Ich glaube/ glaubte | I believe/believed | |
| Es findet / fand instatt | It takes / took place in | |
| Es wird stattfinden. | It will take [place | |
| Es macht Spaß/ hat Spaß gemacht | It is/was fun | |
| Es wird Spaß machen. | It will be fun. | |
| Es gefällt mir. | I like it | |
| Es hat mir gefallen | I liked it. | |
| Es wird mit gefallen. | I will like it. | |
| Es ist/war das Allerbeste. | It is/was the best of the best. | |
| Es wird das Allerbeste sein. | It will be the best of the best. | |

| | |
|-------------------|--|
| Animation | Animation is the process of creating a collection of sequential images and playing them back quickly to create an illusion of movement. Each image, just like a picture you take with a camera, marks a significant instance in time, and is known as a keyframe. |
| Frame | An image representing a moment in time that can be connected to other frames to generate a video. |
| Keyframe | A visual waypoint along the animation path in a map or scene. When an animation is played, values such as the location of the camera, the current map time, the current map range, and layer transparencies are interpolated between the stored states using a configurable transition type. |
| Transition time | The time span between keyframes. The default transition time is three seconds, but this can be configured to a different length or automatically calculated using the travel speed of the camera. |
| Frame Rate | The speed at which frames progress in an animation. Measures usually as frames per second (fps). – In animation for film the typical frame rate is 24 frames per second. Since, most traditional animation is typically done on “twos” (e.g. each drawing is shown for TWO frames) a typical second of animation will consist of 12 unique drawings. |
| Tweening | Tweening, which is short for "in-betweening," is a technique that creates the illusion of smooth movement by generating frames that go between two keyframes. This makes the animated motion look seamless because the in-between frames fill in the gaps. |
| Ease in, ease out | This animation principle is also known as 'slow in and slow out'. In the real world, objects have to accelerate as they start moving and slow down before stopping. For example, a person running, a car on the road or a pendulum. |

Animation: Photoshop

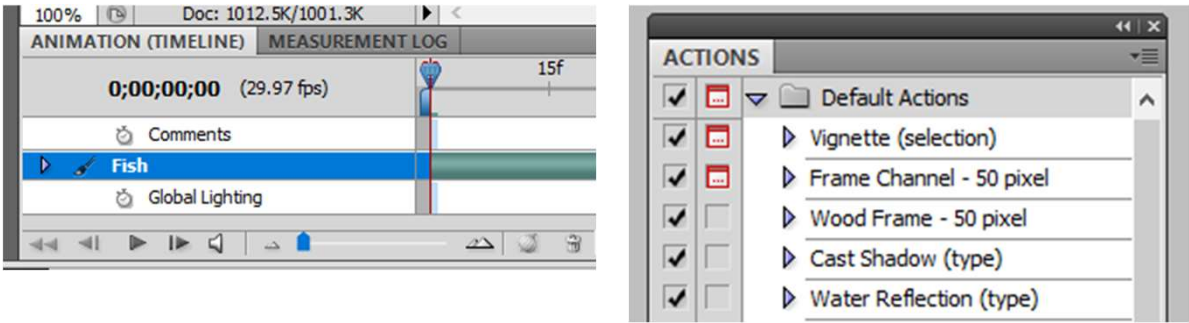
Frame



Frame rate adjustment

Tweens

Add Frame



- There are five main types of animation:
- 3D - computer generated imagery (CGI) is used to create characters and the worlds they inhabit. This is the most common method in modern animation.
 - Traditional - also known as cel animation, hand-drawn and 2D. This is the original method of animation, dating back to the 19th century.
 - Stop motion - involves physically moving objects, often made with clay, one frame at a time.
 - Motion graphics - animated graphic design that brings text and images to life.
 - Vector - a more modern version of traditional, using 2D graphics

Bournemouth School: History Department: Knowledge Organiser: Year 9: Paper 2 Origins of Cold War 1941-58

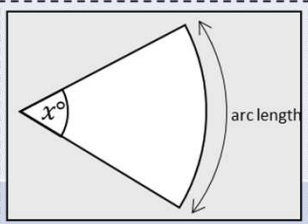
Timeline of key events:

1941: Grand Alliance set up
November 1943: Tehran Conference
February 1945: Yalta conference
April 1945: Roosevelt, President of the US died.
July 1945: Potsdam Conference
16th July 1945: US successfully tested an atomic bomb
1946: Churchill delivered his 'Iron Curtain' speech in Missouri, USA
1946: Long Telegram sent by George Kennan
1946: Novikov Telegram sent
1947: Truman Doctrine which included the policy of containment
1947: Marshall Plan outlined, officially called the European Recovery Plan
1947: Cominform set up
1948: The communists in Czechoslovakia, seized control
1948-49: Berlin Blockade
1949: Comecon set up
May 1949: western Allies announced their former occupation zones including west Berlin would join together to form the FRG
October 1949: The Soviet zone of Germany became the GDR.
April 1949: NATO set up
1953: By now the US had given \$17bn to help European countries rebuild.
1953: Death of Stalin. Rakosi replaced by Imre Nagy as Hungary's PM.
1955: Nagy replaced by Rakosi
1956: Khrushchev's secret speech
1955: Warsaw Pact set up
1957: Sputnik launched
1956: Hungarian Uprising

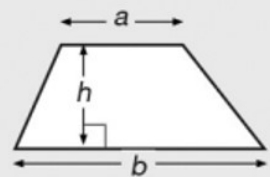


| Key terms/definitions | | |
|--|---|---|
| Term | Definition | ✓ |
| Arsenal | Collection of military equipment and weapons | |
| Bolshevik Revolution | Took place in Russia in October/November 1917 when the Bolsheviks seized power and set up a communist state | |
| Comecon | Association of Soviet-oriented communist countries set up in 1949 to co-ordinate economic development | |
| Cominform | Communist Information Bureau established in 1947 to exchange information among 9 Eastern European countries and coordinate their activities | |
| Containment | Using US influence and military resources to prevent the expansion of communism into non-communist countries | |
| De-Stalinisation | Elimination of the influence of Stalin initially promoted by Khrushchev after 1956 | |
| H-bomb (hydrogen bomb) | An explosive weapon of enormous destructive power | |
| Interwar years | The period between the two world wars: 1919-1939 | |
| MAD (Mutually Assured Destruction) | The belief that nuclear weapons made each side more secure and less likely to attack. The enemy would not dare to attack first, because if it did, the other would strike back before its bombs had landed and it too would be destroyed. | |
| Marshall Aid | US programme of financial and economic aid given to Europe after the end of WW2. | |
| Marshall Plan | A special system of loans from the USA to European countries implemented at the end of the Second World War which allowed for reconstruction and economic regeneration. General George Marshall was the senior US army officer who devised the plan. | |
| NATO (North Atlantic Treaty Organisation) | Created in 1949 following the Berlin Crisis of 1948-1949, its 12 founding members included the USA and Canada, Britain and France. NATO exists to protect the freedom and security of its members using both political and military means. Today, it has 28 member countries. | |
| Nuclear weapon | Highly destructive explosive device that gets its power from nuclear reactions. | |
| Purge | Elimination of opponents from a state or political party | |
| Red Army | The Soviet army | |
| Reparations | Compensation to other countries to be paid by Germany as the defeated country after WW2 | |
| Satellite states | Countries under the domination of a foreign power: in this context, the USSR | |
| Secret police | Police agency which operates in secret to protect national security. Generally used to frighten opponents and critics of a government. | |
| Sphere of influence | Region of the world in which one state is dominant | |
| Soviet bloc | Countries in Eastern Europe controlled by the Soviet Union | |
| Superpower | A country or state that has great power and influence globally | |
| Truman Doctrine | Truman's idea that it was the USA's duty to contain the spread of communism. To do this he was prepared to engage the US in military enterprises all over the world. | |
| Warsaw Pact | A military treaty and association consisting of the Soviet Union and its European satellite states | |

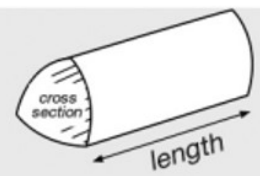
Year 9 – Maths – Summer 1 – Unit 7

| Keyword | Definition | Example |
|----------------|--|---|
| Hectare | The area of a square 100m by 100m. $1\text{ ha} = 100 \times 100 = 10\,000\text{ m}^2$ | A 200m by 300m field. $\text{Area} = 60,000\text{m}^2 = 6\text{ha}$ |
| Upper bound | The upper bound is the largest number that would round down to a given value at a given degree of accuracy. | Upper bound of 250, rounded to the nearest 5, is 252.5 |
| Lower bound | The lower bound is the smallest number that would round up to a given value at a given degree of accuracy. | Lower bound of 3.87, rounded to 3 significant figures, is 3.865 |
| Error interval | The error interval for a rounded value is $\text{lower bound} \leq x < \text{upper bound}$ | The error interval for 9.3, rounded to 1 decimal place, is $9.25 \leq x < 9.35$ |
| Truncate | To truncate a number to a given place value, you remove the following digits <i>without</i> rounding. If necessary, add 0's to maintain place value. | 5361 truncated to 2sf = 5300 0.382 truncated to 2dp = 0.38 |
| Surface Area | The total area of all its faces. | The surface area of a cube of length 3cm $SA = 6 \times 3^2 = 54\text{cm}^2$ |
| Prism | A 3D solid that has the same cross section all through its length, where the front and back faces are joined by rectangles | A cuboid, A triangular prism (Toblerone). A cylinder is not a prism |
| Capacity | The amount of liquid a 3D object can hold. Measured in ml or litres. | $1\text{l} = 1000\text{cm}^3$ $1\text{ml} = 1\text{cm}^3$ |
| Circumference | The perimeter of a circle. $C = 2\pi r = \pi d$ | |
| Arc | Part of the circumference of a circle. $\text{Arc} = \frac{\theta}{360} \times 2\pi r$ |  For a sector with angle x° of a circle with radius r Arc length = $\frac{x}{360} \times 2\pi r$ Area of sector = $\frac{x}{360} \times \pi r^2$ |
| Sector | A slice of a circle between an arc and two radii. $\text{Area} = \frac{\theta}{360} \times \pi r^2$ | |

Area of a trapezium $= \frac{1}{2}(a + b)h$

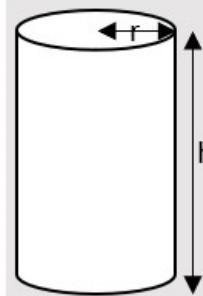


Volume of a prism
= area of cross section \times length



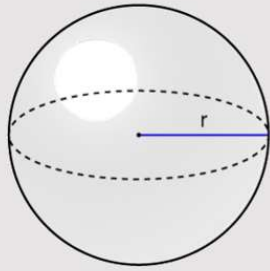
The volume of a cylinder is
 $V = \pi r^2 h$

The total surface area of a cylinder is
 $A = 2\pi r^2 + 2\pi rh$



The volume of a sphere is
 $V = \frac{4}{3}\pi r^3$

The surface area of a sphere is
 $A = 4\pi r^2$

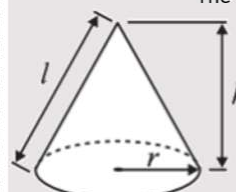


The volume of a pyramid is
 $V = \frac{1}{3} \times \text{area of base} \times \text{vertical height}$

The volume of a cone is $V = \frac{1}{3}\pi r^2 h$

Curved surface area of cone
 $A = \pi rl$

Total surface area of a cone
 $A = \pi rl + \pi r^2$





Purcell – Music For A While

Background

Henry Purcell 1659-1695 English composer of the Reformation period. Worked at Westminster Cathedral as well as composing for stage and for Royalty

Oedipus—play by John Dryden and Nathaniel Lee about Oedipus

Incidental music—music written to go with a play, but where the play is not primarily musical. Often used for transitions etc

Baroque pitch—before A=440 was introduced, pitch was more variable and generally lower. Playing at this pitch on reproduction or period instruments is known as Baroque pitch. Approx one semitone lower than standard pitch.

Lament—song with sorrowful mood. Often slow and in the minor key

Rhythm

Constant quavers—when a part moves only in quavers e.g. the ground bass

Quadruple metre—4/4—4 crotchets in each bar

Tempo is not indicated due to the historical period—a slow tempo would be appropriate

Texture

Basso continuo—literally continuous bass line. Accompaniment played by a melodic bass instrument, often a cello, and a chordal instrument such as harpsichord, lute or organ

Arpeggiation - when a chord is played by spreading the notes playing (usually) from bottom to top.

Melody dominant homophony—texture with one clear melody and an independent accompaniment.

Counterpoint—literally tune against tune—2 rhythmically independent melodies playing at the same time

Structure

Ground bass—a repeating bass line pattern played throughout the piece

Da Capo aria—ABA or ternary form. Da Capo means again from the beginning.

Melody

Syllabic—vocal setting with one note per syllable.

Melisma—vocal setting where more than one note per syllable is used

Word painting—depicting a word in music to imitate its meaning.

Range—the interval between the highest and lowest notes in any given part.

Trill—rapid alternation of written note and the note above

Grace note—an additional note or notes played or sung before the main melodic note.

Mordent—ornament where the main note is played followed rapidly by the one above and then the main note.

Slide—when a performer doesn't move cleanly from one pitch to another, instead sliding through all frequencies in between the two pitches

Sequence—melodic device where a short section is immediately played again at a higher or lower pitch. Used in the ground bass.



This QR code will take you to a Spotify playlist with audio examples of many of the concepts covered on this sheet and in lessons. You will find it helpful to listen to these as you learn.



False relation – a type of dissonance where to versions of the same note are used in quick succession e.g. in b1 the F# in the bass is followed by an F natural in the right hand of the harpsichord

Dominant—5th degree of scale

Tonic—1st degree of scale

Passing note—a stepwise note between two harmony notes a 3rd apart

Instrumentation

Soprano—high pitched female voice

Countertenor—male voice which sings in the alto range

Harpsichord -keyboard instrument in which the strings are plucked. Has no ability to sustain notes or to vary the dynamics. Plays basso continuo in this piece

Bass viol—large bowed and fretted string instrument similar in range to a cello. Plays the ground bass and the basso continuo in this piece.

Tonality

A minor—minor key starting on A

Modulation—changing key. This piece modulates to Em (b14 and b 27), G (b16), C (b21), A (b28)

Perfect cadences - chord progression V-I. Used to cement modulations

Harmony

Figured bass—system of notating chords for the continuo instruments. Numbers are written underneath the bassline to indicate the intervals to be played above the bass note.

Ground bass—bass line which repeats throughout the whole piece and over which the rest of the music is composed.

Suspension—prepared dissonance. Prolonging a note to create a dissonance with the next chord before resolving the dissonance.

Tierce di Picardy—ending a minor key piece with a major chord

Diatonic—chords which only use notes from the key

Functional—chords which help to define the key



This QR code will take you to a Spotify playlist with audio examples of many of the concepts covered on this sheet and in lessons. You will find it helpful to listen to these as you learn.



| Keyword | Learn | ✓ |
|--------------|---|---|
| Intimacy | a close, familiar, and often affectionate or loving personal relationship with another person or group. | |
| Pleasure | enjoyment or satisfaction derived from what is to one's liking | |
| Consent | is an agreement by choice made by someone with the freedom and capacity to consent. | |
| Readiness | the condition of being ready. | |
| Respect | due regard for the feelings, wishes, or rights of others. | |
| Pressure | to force (someone) toward a particular end; influence. | |
| Persuasion | to move by argument, entreaty, or expostulation to a belief, position, or course of action | |
| Harassment | when someone repeatedly behaves in a way that makes another person feel scared, distressed or threatened. | |
| Values | principles or standards; one's judgement of what is important in life | |
| Capacity | Ability to do something or make a decision | |
| Manipulation | to control a person or situation to one's own advantage by artful, unfair, or insidious means | |
| Freedom | the power or right to act, speak, or think as one wants | |

Relationship advice:

- **Be respectful** at all times
- **Communicate clearly**, share your thoughts and seek the thoughts of others without judgement
- **Safety**, keep each other safe
- **Consent**, it is the person seeking consent who is responsible for ensuring that these conditions are met. Ask, do not assume.

Remember - the law is there to protect young people. Naked images of under 18s are illegal, but you will not be in trouble with the police if someone has made you share an image of yourself. The law was created to protect young people, not get them into trouble. NOTE: You will be trouble if you share naked images of others who are under 18; with or without their consent.

Useful websites:

<https://www.childline.org.uk/> 0800 1111

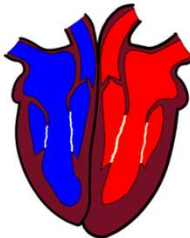
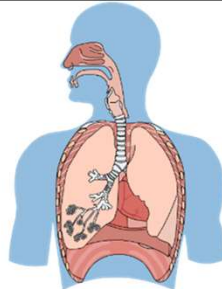


Brook: www.brook.org.uk/help-advice

For advice on where to get help after a sexual assault, www.nhs.uk/live-well/sexual-health/help-after-rape-and-sexual-assault

You can contact Victim Support if you feel you, or someone you know, may have been a victim of a sexual offence:

www.victimsupport.org.uk

3.1.1.4 The short and long term effects of exercise KO 1 of 1

| Immediate Effects of Exercise | | Long Term Effects of Exercise | |
|--|--|---|---|
| Breathing rate increases | Exercise causes muscles to use more oxygen, so the lungs must work harder & faster to keep the body supplied with O ₂ & to exhale the CO ₂ produced. | Long-term Effects of Exercise on the Heart |  |
| | | The heart muscle becomes thicker and stronger. This is known as cardiac hypertrophy. | |
| | | Stroke volume increases – the amount of blood pumped per beat. | |
| | | Maximal cardiac output increases – the amount of blood pumped per minute. | |
| Tidal volume increases | From around 0.5L to 4.5L. | Resting heart rate gets slower as more blood is pumped per beat (Stroke Volume). | |
| Heart rate increases | To supply the muscles with more O ₂ . | Long-term Effects of Exercise on the Lungs |  |
| Anticipatory Rise | The heart begins to beat faster in anticipation of exercise. | The diaphragm and intercostal muscles become stronger, which means the lungs can take in and breathe out more air. | |
| Stroke volume increases (the volume of blood per beat) | From around 50ml to between 120-200ml. | Vital Capacity increases – the maximal amount of air that can be exhaled after inhaling as much as possible. | |
| Cardiac output increases | As a result of the two factors above. | Tidal Volume increases – the amount breathed in and out in a normal breath. | |
| Vasodilation occurs | Arteries respond by allowing more blood to pass through them. Capillaries close to the skin also dilate so that more heat is lost to the environment. | Increased capillarisation around the alveoli. This makes gaseous exchange more efficient. | |
| Vasoconstriction occurs | Blood is diverted away from systems that are not involved in the activity (e.g. the digestive system). | Long-term Effects of Exercise on the Skeleton |  |
| | | Increased bone density and strength. | |
| | | Stronger, denser bones are better at carrying weight and more resistant to injury. | |
| Lactic acid | Is produced as a by-product of anaerobic respiration. | Note – the increase in bone density is specific to the activity – walking will strengthen the bones in your legs (femur, tibia, fibula). | |
| Short-term Effects of Exercise | | Long-term Effects of Exercise on the Muscles | |
| Fatigue | Due to depleted glycogen stores. | Increased capillarisation around the muscles. This will allow increased gaseous exchange to the muscles. |  |
| Light-headedness | | Weight training will see an increase in the strength of skeletal muscle. The muscle fibres will become thicker and stronger (muscular hypertrophy). | |
| Nausea – | Due to over exertion. | An increase in the number of fast twitch muscle fibres. | |
| Delayed Onset of Muscular Soreness (DOMS) | Due to the build-up of lactic acid plus the microscopic tears in the muscle fibres. | Endurance training will enable muscles to work for longer. | |
| Cramp | | The number of slow twitch muscle fibres will increase. | |
| Glycogen Stores | Are depleted and need to be replenished. | The heart muscle becomes thicker and stronger. This is known as cardiac hypertrophy. | |

Topic 5a - Forces

| Keyword | Learn | ✓ |
|--------------------------|---|---|
| Scalar | A quantity with size (magnitude) only. | |
| Vector | A quantity with both size and direction. A vector quantity may be represented by an arrow. The length of the arrow represents the magnitude, and the direction of the arrow the direction of the vector quantity. | |
| Velocity | Speed in a given direction. Velocity is a vector. | |
| Displacement | Distance travelled in a given direction. Displacement is a vector. | |
| Force | A push or pull. Measured in newtons, N. Force is a vector. | |
| Contact force | Force exerted between two objects when they touch. E.g. friction, air resistance, tension and normal contact force. | |
| Non-contact force | Force exerted on objects when they are physically separated. E.g. gravity, electrostatic and magnetic forces. | |
| Centre of mass | The point at which the weight of the object can be taken to act. In diagrams, arrows representing the weight should start from this point. | |
| Resultant force | A single force that can replace multiple forces acting on an object. | |
| Free body diagram | Used to show the magnitude and direction of all the forces acting on the object. | |
| Work | When a force of 1 N pushes an object 1 m, in the direction of the applied force, then 1 J of work is done | |
| Elastic deformation | When an object is stretched, it returns to its original length after the forces are removed. | |
| Inelastic deformation | When an object is stretched, it does not return to its original length after the forces are removed. | |
| Extension | The difference between the stretched and unstretched lengths of a spring. | |
| Elastic potential energy | The energy stored in a stretched (or compressed) spring. | |
| Moment | The turning effect of a force. Measured in newton metres, Nm. | |
| Principle of moments | When a system is balanced the sum of the anti-clockwise moments equal the sum of the clockwise moments. | |
| Fluid | A liquid or a gas. It flows and can take the shape of the container. | |

| Quantity | Unit | Symbol |
|------------------------------|---------------------------|----------|
| force | newton | N |
| mass | kilograms | kg |
| gravitational field strength | newtons per kilogram | N / kg |
| work | joule | J |
| extension | metre | m |
| spring constant | newtons per metre | N / m |
| elastic potential energy | joule | J |
| moment | newton metres | Nm |
| pressure | newtons per metre squared | N/m^2 |
| density | kilograms per metre cubed | kg/m^3 |

Pressure in fluids. Learn these two statements.

The pressure in fluids causes a force normal (at right angles) to any surface.

A partially (or totally) submerged object experiences a greater pressure on the bottom surface than on the top surface. This creates a resultant force upwards. This force is called the upthrust.

Equations

Weight = mass x gravitational field strength $W = m \times g$

Work done = force x distance in the direction of the force $W = F \times s$

Force = spring constant x extension $F = k \times e$

Elastic potential energy = $\frac{1}{2} \times$ spring constant \times (extension)² $E_e = \frac{1}{2} \times k \times e^2$

Moment = Force x perpendicular distance $M = F \times d$

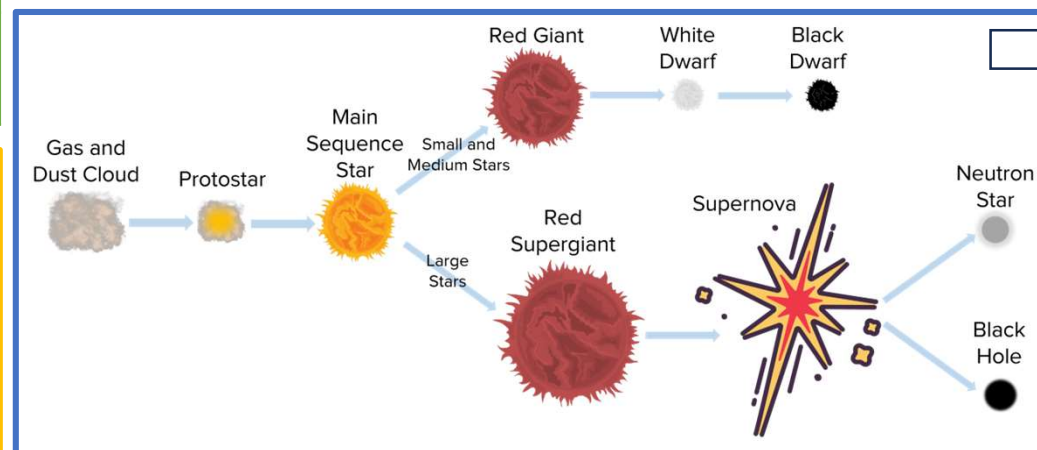
Pressure = $\frac{\text{Force normal to the surface}}{\text{area of the surface}}$ $P = \frac{F}{A}$

Pressure = height x density of the liquid x gravitational field strength $P = h \times \rho \times g$

Topic 8 – Space

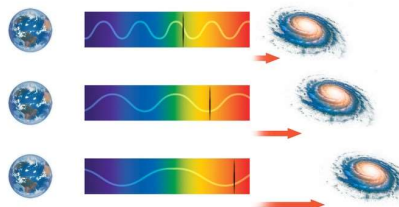
| Keyword | Learn | ✓ |
|-----------------|--|---|
| Planet | A large body which orbits a star (like the Sun). | |
| Moon | A natural satellite which orbits a planet. | |
| Solar system | The sun, eight planets, the dwarf planets and moons. Many other stars have similar planetary systems. | |
| Galaxy | A large group of stars. | |
| Milky way | The galaxy we live in. | |
| Nuclear fusion | The joining of light nuclei to form a heavier nucleus. Some of the mass is converted into energy. | |
| Velocity | Speed in a given direction. | |
| Orbit | Path of an object in (near) circular motion around another object. | |
| Red-shift | Light is moved towards the red end of the spectrum as the wavelength increases. | |
| Big bang theory | Theory that suggests that the universe began from a very small region that was extremely hot and dense about 13.8 billion years ago. | |

| Star life cycle terms – Learn the names in the correct order. Learn to draw the diagram. | | |
|--|---|--|
| Nebula | Cloud of gas and dust | |
| Protostar | Large ball of gas which contracts to form a star | |
| Main sequence | Releases energy by fusing hydrogen to form helium Forces are balanced; gravitational collapse balanced by expansion due to fusion energy | |
| Red giant | A very large star which fuses helium into heavier elements | |
| White dwarf | Collapsed red giant. Fusion stops and the star slowly cools | |
| Supernova | Gigantic explosion caused by runaway fusion reactions in a very large star. Elements heavier than iron are produced here | |
| Neutron star | Very dense small star made out of neutrons | |
| Black hole | The most concentrated state of matter, from which even light cannot escape | |



Red-shift and the Big Bang theory

- Red shift is the observed increase in the wavelength of light due to the object moving away.
- The quicker the object moves away the greater the increase in wavelength.
- Galaxies further away are more red-shifted.
- This is evidence that the universe is expanding and supports the Big Bang theory.
- New evidence requires scientists to develop different theories.
- Since 1998, observations of supernovae suggest that distant galaxies are receding ever faster.
- New evidence has lead to new theories about Dark Mass and Dark Energy.



Equations

$$\text{orbital distance} = 2 \times \pi \times \text{orbital radius} \quad s = 2 \times \pi \times r$$

$$\text{average speed} = \frac{\text{distance}}{\text{time}} \quad v = \frac{s}{t}$$



| | | |
|--|--|---|
| <p><u>The nature of God (what is God like?)</u></p> <ul style="list-style-type: none">• God is omnipotent (all powerful)• God is omnibenevolent (all loving)• God is just (fair) <p><u>Key Quotations</u></p> <p>“For nothing is impossible with God’ - shows God is omnipotent</p> <p>“For God so loved the world, he gave his One and Only Son” - God is omnibenevolent</p> <input type="checkbox"/> | <p><u>Creation</u></p> <p>Creation - the act by which God brought the universe into being</p> <p>The Word – term used at the beginning of John’s gospel to refer to God the Son</p> <p>Christians believe that God created the earth and all living things. Some take the creation story in Genesis literally, therefore they believe God created the world in 6 days and rested on the 7th whereas other Christians believe it is symbolic and teaches them about what God is like.</p> <p>Key quotation -> “in the beginning, God created the heavens and earth”</p> <input type="checkbox"/> | <p><u>The Trinity</u></p> <p>Trinity - Christians believe there are three persons in the One God: Father, Son and Holy Spirit. Each person of the Trinity is fully God.</p> <p>The Father - creator of life</p> <p>The Son - became incarnate through Jesus. Fully God and fully human</p> <p>The Holy Spirit - guides and comforts Christians</p> <p>Key quote -> “ We believe in one God’</p> <input type="checkbox"/> |
| <p><u>Incarnation</u></p> <p>Incarnation - the belief that Jesus was God in human form (becoming flesh, taking a human form)</p> <p>Jesus was fully God and fully human, which helps explain his miracles and resurrection.</p> <p>His words and teachings have authority because they are the word of God.</p> <p>Christians believe that Jesus is the Messiah (saviour)</p> <p>Key quotation -> “The Word became flesh and made his dwelling among us.” John 1:14 NIV</p> <input type="checkbox"/> | <p><u>Crucifixion</u></p> <p>Crucifixion - Roman method of execution by which criminals were fixed to a cross</p> <ul style="list-style-type: none">• Jesus was accused of blasphemy (proclaiming to be God) and was crucified on Good Friday• Although he was fully God he still felt pain as he was also fully human• Christians believe God understands suffering as Jesus suffered and therefore accept suffering as a part of life• Jesus’ death on the cross washed away humanities sins <p>Key quotation -> ‘Father, into your hands I commit my spirit.”</p> <p>Luke 23:46 NIV</p> <input type="checkbox"/> | <p><u>Resurrection and ascension</u></p> <p>Resurrection - rising from the dead. Jesus rising from the dead on Easter Sunday</p> <p>Ascension - the event, 40 days after Jesus’ resurrection, when Jesus returned to God, the Father in heaven</p> <p>Christianity is based on the belief that Jesus died and resurrected</p> <p>Resurrection is important as it teaches Christians not to fear death and that their sins will be forgiven if they follow God’s laws.</p> <p>Ascension is important as it shows Jesus is with God in heaven.</p> <p>Key quotation -> ‘He is risen!’</p> <input type="checkbox"/> |
| <p><u>Resurrection and life after death</u></p> <p>Christians believe that because Jesus resurrected they will too. There are different Christian beliefs about resurrection: some believe a person’s soul is resurrected straight after death, others believe it happens at the end of time when Jesus returns to play the role of judge.</p> <p><u>How does the belief in resurrection impact Christians?</u></p> <ul style="list-style-type: none">• Means life after death is real• Gives them confidence in the face of death• Inspires them to live a good life and follow Gods laws <p>Key quotation -> “So it will be the resurrection of the dead.”</p> <input type="checkbox"/> | <p><u>The afterlife and judgement</u></p> <p>Day of Judgement - a time when the world will end and every soul will be judged</p> <p>Christians believe Jesus plays the role of judge as he has lived life as a human and set the path for Christians to follow</p> <p>They will be judged based on their behaviour and actions as shown in the Parable of the Sheep and Goats</p> <p>Key quotation -> “I am the way and the truth and the life. No one comes to the Father except through me”</p> <p>“For I was hungry and you gave me something to eat...”</p> <input type="checkbox"/> | <p><u>Heaven and hell</u></p> <p>Heaven - a state of eternal happiness (with God)</p> <p>Hell - place of eternal suffering (separated from God for eternity)</p> <p>Purgatory - intermediate state where the soul is cleansed (Catholic belief)</p> <p>Christians believe if they have lived a good life and had faith in God they will be rewarded with heaven and if they have lived a bad life they will be punished with hell.</p> <p>Some believe that heaven and hell are physical places, whilst others believe they are spiritual places.</p> <input type="checkbox"/> |
| <p><u>The role of Christ in salvation</u></p> <p>Atonement - restoring the relationship between God and humans through the life, death and resurrection of Jesus</p> <ul style="list-style-type: none">• Jesus’ crucifixion made up for the original sin of Adam and Eve• The death of Jesus restored the broken relationship between God and humans which allowed for salvation to be achieved• Christians can now be forgiven for their sins and go to heaven• Jesus atoned for the sins of humanity <p>Key quotation -> ‘For the wages of sin is death, but the gift of God is eternal life in Christ Jesus our Lord’ Romans 6:23 NIV</p> <input type="checkbox"/> | <p><u>Sin and salvation</u></p> <p>Sin - any thought or action that separates humans from God</p> <p>Original sin - everyone is built with the urge to sin/Adam and Eve brought sin into the world</p> <p>Salvation - saving the soul from sin, made possible by Jesus</p> <p>Grace - God’s love which humans do not have to earn</p> <p>Salvation through good works -> can be achieved by doing good and following God’s laws:</p> <p>“Faith... without action is dead’</p> <p>Salvation through grace -> salvation is given by God to show his love, does not have to be earnt ‘For it is by grace you have been saved”</p> <input type="checkbox"/> | |

| Describe Andalucía | | |
|--------------------|-------------------|--|
| En la foto | In the photo | |
| A la izquierda | To the left | |
| A la derecha | To the right | |
| En el centro | In the centre | |
| Al fondo | In the background | |
| Hay... | There is | |
| un bosque | a forest | |
| un río | a river | |
| un barco | a boat | |
| una torre | a tower | |
| unos edificios | some buildings | |
| vistas bonitas | pretty views | |
| unos árboles | some trees | |

| En ruta | | |
|----------------|-------------------|--|
| Me gustaría.. | I would like to.. | |
| Quisiera.. | I would like to.. | |
| viajar en | travel by... | |
| coger el | take the... | |
| porque | because | |
| es más...que | it's more...than | |
| es menos...que | it's less...than | |
| es tan...como | it's as...as... | |
| es mejor que | it's better than | |
| es peor que | it's worse than | |
| económico | economic | |
| práctico | practical | |
| sostenible | sustainable | |
| cómodo | comfortable | |

| El tiempo | | |
|-------------|--------------|--|
| Hace.. | It is.. | |
| sol | sunny | |
| frío | cold | |
| viento | windy | |
| buen tiempo | good weather | |
| calor | hot | |
| mal tiempo | bad weather | |
| llueve | It's raining | |
| nieva | It's snowing | |

| Los superlativos | | |
|---------------------------|------------|--|
| El / la / los / las más | The most | |
| El / la / los / las menos | The least | |
| conocido/a(s) | well-known | |
| lindo/a(s) | beautiful | |
| peligroso/a(s) | dangerous | |
| típico/a(s) | typical | |
| mayor | biggest | |
| menor | smallest | |
| mejor | best | |
| peor | worst | |

| ¿Qué tal tus últimas vacaciones? | | |
|----------------------------------|-----------------|--|
| Acabo de .. | I have just .. | |
| Acabamos de .. | We have just .. | |
| volver de | come back from | |
| regresar de | returned from | |
| visitar | visited | |
| ir a | been to | |

| La cultura en la calle | | |
|------------------------|-----------------------------|--|
| Las fiestas | Festivals | |
| Si te gusta(n)... | If you like... | |
| Si te encanta(n)... | If you love... | |
| los desfiles | parades | |
| las fiestas | festivals | |
| las tradiciones | traditions | |
| los festivales | festivals | |
| hay que... | you have to... | |
| ver las Fallas | see the Fallas festival | |
| ir a la Tomatina | go to the Tomatina festival | |
| quemar | to burn | |
| correr | to run | |
| tirar | to throw | |

| ¡Descubre Andalucía! | | |
|-----------------------------|------------------------|--|
| el mar | the sea | |
| el valle (precioso) | the (beautiful) valley | |
| los caballos | horses | |
| los pájaros | birds | |
| los* turistas (extranjeros) | (foreign) tourists | |
| las tiendas | shops | |
| los monumentos | monuments | |
| el paisaje hermoso | beautiful landscape | |
| el turismo (sostenible) | (sustainable) tourism | |
| la arena | sand | |
| el parque acuático | water park | |

Timetable

[illegible]