Year 9
Knowledge Organiser
Term 3 and 4

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Part of United Learning

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North Oxfordshire Academy Values

We believe that, of the United Learning Values, the three that best define North Oxfordshire Academy are **Respect, Ambition and Determination**. Our mission, our vision and our values have been arrived at after consultation with staff and students at North Oxfordshire Academy.

Our Mission:

We exist to provide our students with the best life chances in Oxfordshire.

Our Vision:

To be an academy where students receive a world class education in character and academics leading to happiness and fulfilment in life.

Respect

- Respect for others
- Respect for ourselves
- Respect for our environment

Ambition

- Aiming to achieve the highest possible outcome
- Aspiring to achieve the best possible jobs, college and university places
- Offering leadership opportunities for all

Determination

- Not giving up during adversity
- Embracing the challenges of learning at a higher level
- Support each other to achieve

Student Equipment

Ready to Learn?

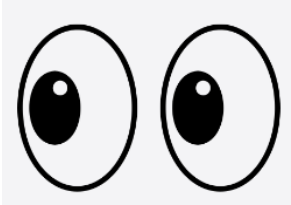
• 2 pens (black/blue)	• Non-permanent whiteboard pen
• 1 Green pen	• Knowledge Organiser – Given by school
• 1 pencil	• 1 scientific calculator (Must be a Casio FX85)
• 1 rubber	• Home Learning book – Given by school
• 1 ruler	• A school bag

Home Learning Book

- The Home Learning book should be in the student's bag at all times
- Clearly date and title (including subject title) each piece of home learning in the Home Learning book
- Underline with a ruler after each completed piece.
- Use both sides of the page and don't leave empty spaces.
- The back pages of the Home Learning book are to be used as your reading log

Using Knowledge Organisers to self-quiz

Your child will be issued with a Knowledge Organiser each term with all subjects in one booklet. Subject Knowledge Organisers can also be found on the academy website.



LOOK

- Read the definition of the first key word in your head.

SAY

- Cover it up and say in back to yourself, repeat with all four words.
- Uncover the words and check you said it correctly.

COVER

- Cover up all four words.

WRITE

- Write out the definitions for all four words from memory.

CHECK

- Uncover the definitions and green pen to correct.

Home Learning

Students will receive a homework timetable for core subjects at the start of the year so that they can plan and organise their homework each evening.

This will also be on the academy website. Home Learning will be published on TEAMS and you will be able to see all your home learning in the Assignments tab.

There are Home Learning Clubs every day that all students are welcome to attend should they need access to computers or learning support.

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bedrock learning®

sparx

SENECA

Arbor

unifrog


Term 5
Term 6
Term 3
Term 4
Term 1
Term 2
FGM
Recreational drug use
Substances misuse and emergency aid
Medicine safety
Substances & communities
Bullying, mental health, abusive behaviour
Drugs & the law
Relationship loss and change
Why do people behave differently online?
Positive use of the media
Family Diversity
Sexting
Pornography
Careers
Unifrog Reslilience
Unifrog identifying interests
Study Higher all about me
Options
Pathways
Money worries
Sleep & relaxation
Managing peer approval
Isolation & mental health
What affects mental health?
Support for mental health
Promoting inclusion in the community
Championing the LGBTQ+ community
Illegal employment
Working part time
My rights & responsibilities as a consumer
Extremism
Sexually transmitted infections
Contraception
Prevention of infection
Positive & respectful relationships
Communication skills for an intimate relationship
Unintended Pregnancy
Am I ready for a sexual relationship?
Year 9
2024-2025
Chameleon PDE
Key to Chameleon PDE themes
Keeping safe
Online life & media
Emotional & mental health
Health & fitness
Relationships
Sexual health
Future choices & money
Values, rights & responsibilities
Personal skills development

Year 9

Term 3

Contents

What is a Python?

Python is a **text based programming language** that can be used to create small programs, web applications, games and even search engines like Google and YouTube!

Python is easy to learn and is a great beginner language.

Print statements

In order to display text in the **shell** you need to use a **Print** statement.

```
print ("Hello World")
print ("I am a programmer")
```

This is the output:

```
Hello World
I am a programmer
```

Syntax

Syntax is what we call the format that the code needs to be in, in order to be processed correctly.
If it is not in the correct format then the code will not work.

```
Traceback (most recent call last):
  File "C:/Python33/a.py", line 2, in <module>
    prin (greeting)
NameError: name 'prin' is not defined
```

Python tells us where the error is and what type it is.
Here it says the line the error is on
Here it says what type of error.

Key Words

Python	Programming	Print	Input	Output	
Syntax	IF/ ELIF	String	Integer	Float	Variable

IF statements

IF statements can be used to select different options in a program depending on a condition. Also known as **selection.**

```
question = input("Are you revising?")
if question == "yes":
    print ("Well done!")
elif question == "no":
    print("Oh dear!")
else:
    print("I don't understand")
```

Executing a program

In order to run or **test** a program written in Python the user needs to go to **Run** and then **Run Module.**

Alternatively, you could press the **F5** button on the keyboard.

Variables

A variable is something that can be **used to store information**. The information that is stored can be changed.

Data types

Different types of data are stored in variables as different **data types**. There are **three** main data types:
String, Integer & **Float**

String

A type of variable for storing **text** "strings" **e.g.** "Hello World"

```
string = str("This is a string")
```

Integer

A type of variable for storing **whole numbers**
e.g. 10, 182, -44

```
integer = int("This is an integer")
```

Float

A type of variable for storing **decimal numbers**. Also known as a **real** number
e.g. 2.5, 5.05, 3.14

```
decimal = float("This is a decimal")
```

Intentionally Blank

Practical Rotation

Knowledge Organizer – Year 9 DT

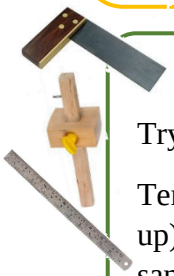
Materials Used:

Pine: a natural softwood from the evergreen Scots Pine tree

MDF: An engineered board, manufactured in sheets from wood dust & glue

Acrylic: A thermoplastic material; comes in many colours & easily cut or melted.

HIPs: High Impact Polystyrene – another thermoplastic, used with a mirrored finish on this project.



Tools Needed for this Project:

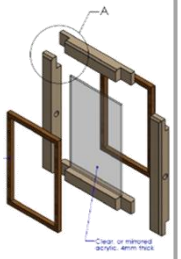
Try Square, marking gauge, steel ruler

Tenon Saw, mallet, chisels (6mm & up), smoothing plane, pillar drill, belt sander.

Key Vocab; "Sub-Assembly":

We know an assembly is a number of parts put together.

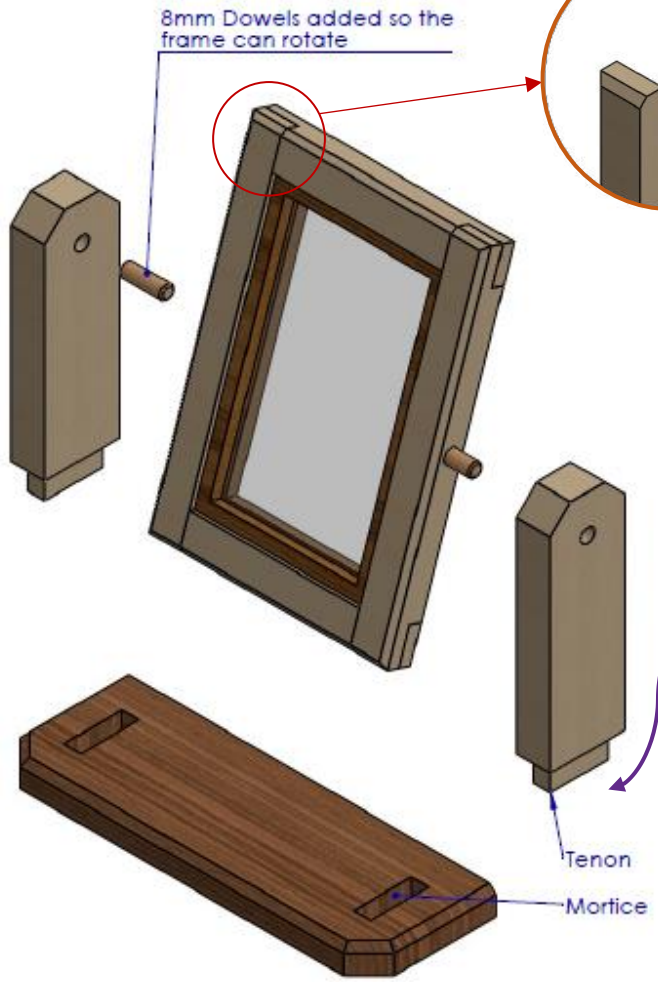
A sub-assembly is when we assemble a collection of parts which are then used together as part of a larger assembly.



In this project, we can make a sub-assembly of the picture frame before assembling it with it's stand.

Dowels: These are small wooden pegs, used in the dowel joint, a quick & strong joint, easily made with just a drill. Used on this project for the pivot point.

The Picture Frame Project:



The Corner Halving Joint:

This is a really useful wood joint for connecting the corners of frames.

It is often called a lap joint because the 2 parts lap over one another.

By cutting this joint we can increase the area for glue to hold the parts together.

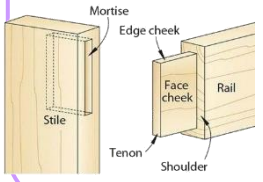
After marking, we need to rip cut down from the end of the workpiece, and cross cut away our waste material at the shoulder. The joint can then be tidied up & made more accurate by paring away any spare waste with a chisel.

The Mortice & Tenon Joint:

This I a great joint for when we need on part of a project to join to & extend from the face of another part, like where the arms to hold the frame join onto the base of our project.

It is made up of a rectangular tongue (the tenon) on the end of one piece which slots into a rectangular hole (the mortice) on the other piece.

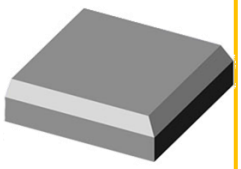
Making this joint accurately takes skill & some patience; sawing the tenon is similar to making the corner halving joint above, but we must cut the shoulder on each side. To make the mortice, we chop out our waste material using a mallet & chisel, digging in from both faces.



To get a good fit, the tenon & mortice must be the exact same size & the shoulder must be level all the way around to sit well on the face of the base.

Key Vocab; "Chamfer":

A chamfer is a small bevel put on the edge of a project part – it removes the sharpness of the edge & adds decoration.



Year 9 DT – Theory Unit Knowledge Organiser

Manufacturing Materials: Plastics;

Plastics are a group of materials called polymers

- **Pros:** They are lightweight, easy to manufacture, durable, colourful & affordable
- **Cons**: They are sourced from crude oil & their production & disposal are harmful to the planet

Thermoplastics; easily softened or melted with heat. Recyclable & good material performance.

Examples = HDPE, Nylon, Polypropylene, Polycarbonate, Polystyrene

Thermosetting Plastics; Can't be remelted with heat. Difficult-impossible to recycle. Often higher performances for specific tasks

Examples = Polyester resin, Epoxy resin, Melamine formaldehyde, Urea formaldehyde, bakelite.

Composite Materials:

Composite materials are materials built of 2+ input materials working together as one. This way we can combine their most useful properties.

GRP; Glass Reinforced plastic – tough, strong, lightweight & affordable. Used in circuit boards

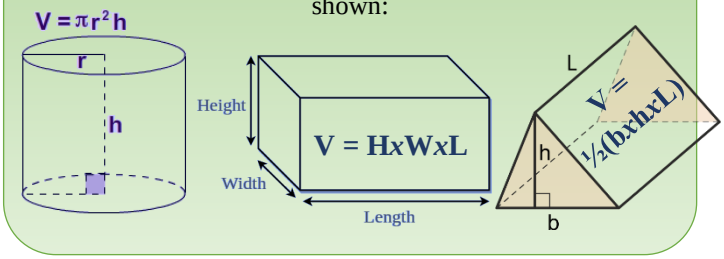
CFRP; Carbon Fibre Reinforced Plastic – excellent strength to weight ratio & tensile Strength

Concrete; Stone, sand & cement – very hard

Plywood; Thin layers of wood laminated together

Maths for DT & Engineering:

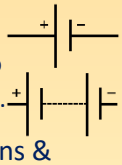
The volume of a shape is how much 3D Space it takes up. Use these formulae to find the volume for the shapes shown:



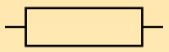
Engineering Elecrtonics:

The below symbols are universally used to show these components in circuit diagrams:

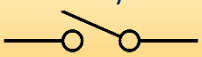
Cell/battery; stores electricity to provide DC current.



Resistor; Controls/ slows the current flow of electrons



SPST Switch; opens & closes the circuit to allow electricity to flow.



L.E.D; A Light Emitting Diode, like a bulb. Very energy efficient.

Product Investigation

Product investigations are a great way to learn ***why materials are chosen for specific jobs*** & explore what other demands impacted on the ***designer's decisions*** & how they ***solved problems*** along the way.

Product Specifications;
What requirements or restrictions might the designer have worked to?

Design Brief; what was the designer's goal/what was their problem to solve?

Common Specifications;

- Aesthetics
- Performance requirements
- Target Audience
- Sustainability
- Cost

Investigating 2 bicycles;

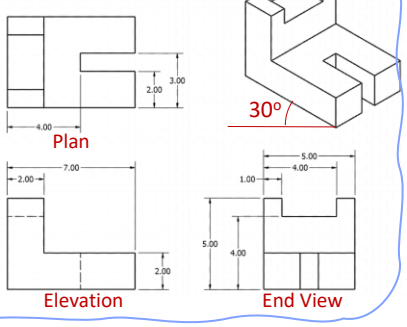
After completing the product investigation, you should be able to explain:

- What a sprocket is
- Why the bicycles differ in design
- Why specific materials were chosen for each
- What design improvements could be made to each

Engineering Drawing:

Orthographic Views show the object from each angle, in 2D. Dimensions are usually attached to these 2D views.

Isometric Projection shows a skewed version of each of these views as we see the object in 3D



Key Vocab for this term:

- Polymer
- Thermoplastic
- Thermosetting plastic
- Composite
- Voltage
- Current
- Ohms
- Isometric
- Orthographic
- Volume
- Material Properties
- Sustainable design
- C.A.D.
- C.A.M.

Knowledge Organiser: Twelfth Night

Writer's Intent
Shakespeare uses as a source of comedy. Shakespeare plays with conventions of gender and moral codes to explore and critique the society he lives in.

Key Characters
Orsino: The Duke of Illyria and its ruler.
Viola/ Cesario: The heroine in the story who disguises herself as her twin brother.
Olivia: A rich countess who is in mourning and uses this to stay off the advances of men.
Sir Toby Belch: Lady Olivia's uncle. He uses Olivia's money to keep himself entertained.
Malvolio: Lady Olivia's steward. He has fantasies that he might marry Olivia and rise above his class.
Feste: Lady Olivia's clown. He is Shakespeare's mouthpiece, criticising other's actions.
Sir Andrew Aguecheek: A knight who is encourage by Sir Toby to court Olivia.
Maria: Lady Olivia's serving woman. She is clever and works with Sir Toby to trick Malvolio.
Sebastian: Viola's twin brother. He is initially mistaken for Cesario which leads to comic mishaps.

Key Idea	Definition
Gender Fluidity	Shakespeare shows how traditional views of gender being fixed can be questioned. He presents a more fluid exploration of gender and the relative powers that come with it that are more in keeping with today's views.
Appearance and Reality	Shakespeare uses characters' reliance on, and faith in, appearance as a source of the majority of the play's misunderstanding that lead to the comic elements.
Love as a Cause of Suffering	Whilst the play ends happily, like any romantic comedy along the way love – or more precisely unrequited love – causes pain. Many of the characters use language that suggests they view love as a curse that attacks its victims suddenly.
Revenge	Revenge brings a darker form of comedy to the play than that of the protagonists. Shakespeare shows how revenge can escalate from actions that at first seem like harmless jest, to ones which are cruel and cause serious mental distress.
The folly of ambition	A reoccurring theme in Shakespeare's plays, it shows how those who overreach their station – and so challenge the natural social order – are doomed to failure. This is one of the ways in which Shakespeare restores, and ensures order.

Key Method	Definition
Shakespearean Comedy	A light-hearted play with a happy ending usually involving marriages between the unmarried characters. Introduction of main character(s), Tragic Event, Journey (physical / self-discovery), Reconciliation, Resolution & Happy Ending
Dramatic Irony	When the full significance of words or actions is clear to the audience but unknown to the character.
Soliloquy	A speech where an actor speaks their thoughts aloud usually when alone.
Symbolism	The use of objects or items to represent other ideas or concepts.

Knowledge Organiser: Twelfth Night

Word	Definition	Word in action
Aside	Lines in a play that are intended to be heard by the audience but unheard by the other characters in the play.	
Characterisation	The building or crafting of a fictional person.	
Disguise	Give (someone or oneself) a different appearance to conceal one's identity.	
Elizabethan	We refer to the time that Elizabeth 1st was on the throne from 1558-1603 as the Elizabethan Era.	
Femininity	Behaviour or qualities regarded as characteristic of a woman.	
Masculinity	Behaviour or qualities regarded as characteristic of a man.	
Motif	A dominant or recurring idea in an artistic work.	
Patriarchal	A system of society or government controlled by men.	
Pun	A joke exploiting the different possible meanings of a word or the fact that there are words which sound alike but have different meanings.	
Sub-plot	A secondary strand of the plot that is a supporting side story.	

Key Terms Year 9	Definition
Healthy Eating	Eating a variety of foods that will give you the correct nutrients to maintain your health, feel good and have energy. They will include Protein, Fats and Carbohydrates
Eatwell Guide	A visual representation of how different foods and drinks can help us to follow a balanced diet. The Eatwell Guide is based on the **5** food groups and shows you how much of what foods should come from each group
Nutrients	A substance that provides nourishment that is essential for the maintenance of life and growth. These are broken down into 2 groups – **Macronutrients and Micronutrients**
Cross-Contamination	The transfer of bacteria from one food source/object to another
Food Sustainability	Sustainable food is food that is healthy and is produced in a humane and ecologically and socially responsible way. Examples are grass-fed beef or lamb, organic chicken and eggs from local farms, grass-fed cows producing milk/cheese, and organic vegetables.
Cuts of Meat	The different parts/cuts of the animal that are used to create different dishes/recipes. For example:- chicken breasts, thighs or wings
Seasonal foods	Foods that are only available at certain times of the year
Food provenance	Knowing where food is grown, reared and caught and how it is produced and transported
Intensive farming	A method of farming aimed at increasing the amount of food produced
Free range farming	A method of farming where animals have access to outdoor space
Sustainable	Meets the needs of the present, without making it difficult for future generations to meet their own needs
Macro and Micro-nutrients	Nutrients are divided into two categories: Macro and Micronutrients. **Macronutrients** are the nutrients that the body needs in large amounts from proteins, carbohydrates and fats. **Micronutrients** are the nutrients that the body needs in smaller amounts and are found in vitamins and minerals.
Amino acid	The building blocks of protein
Essential amino acids	Amino acids your body needs as it can't make them itself
Non-essential amino acids	Amino acids that your body can make by itself
High biological value	Protein foods which contain all of the essential amino acid
Low biological value	Protein foods which are missing one or more essential amino acid
Gelatine	Protein made by boiling animal bones, used for setting food
Protein complementation	When two LBV protein foods are combined to form HBV protein

Cereals	Cultivated grasses. The grains are used as a food source
Fortified	Vitamins and minerals have been added to foods (e.g. flour)
Primary Processing	The process of converting raw food materials into food that can be eaten
Milling	The process of grinding down the wheat grain
Extraction rate	The percentage of the wheat grain found in the flour
Fibre	Nutrients found in the cells walls of cereal grains. It is needed for the digestive system to remain healthy and function properly.
Rolled oats	Oats are rolled into flakes after being partly cooked by steam. This makes the oats easier to cook
Oatmeal	Oats are ground into either coarse, medium or fine grades of oatmeal
Polishing	The process when milling white rice: the outer husk is removed and then the bran and germ
Pasteurised milk	Milk is heated to 72^{o}c for 15 seconds
Sterilised milk	Milk is heated to 110-130^{o}c for 10 to 30 minutes
Ultra-heat treatment (UHT) milk	Milk is heated to 135^{o}c for 1 second
Micro-filtered milk	Milk is filtered and then heated to 72^{o}c for 15 seconds
Secondary processing	Changing primary food products into other types of products
Starter culture	Harmless bacteria used to thicken cheese and yoghurt
Lactose	the name of sugar in milk
Lactic acid	Lactose in milk is converted into this by bacteria in the starter culture
Rennet	This contains an enzyme that breaks down the milk into curds and whey
Coagulate	When protein sets
Curds and Whey	the solid and liquid produced from milk during cheese-making
Conduction	Heat transfers through solid and liquid materials
Convection	Heat travels through air or water
Convection currents	The movement of heat in air or water as heat rises to the surface and cooler air/water falls to the bottom
Radiation	Heat rays directly heat food
Microwave oven	A type of cooking using electromagnetic waves which cause water molecules in the food to vibrate and heat up

Shortening	When fats give biscuits and pastry a crumbly texture
Aeration	Air is trapped in a mixture to make it lighter
Stable foam	A lasting foam: the air stays trapped in the creamed mixture until it is baked
Denature	Protein changes shape
Gas-in-liquid foam	Liquid forms a thin film around each air bubble
Caramelise	The process of sugar melting and changing colour when heated
Boiling	Cooking in liquid at boiling point (100°c)
Simmering	Cooking just below boiling point
Poaching	Cooking very gently in hot water
Steaming	Cooking in the steam coming from boiling water
Deep fat frying	Cooking by covering food in very hot oil
Stir-frying	Cooking small pieces of food quickly in a small amount of oil over a hot heat
Roasting	Cooking in the oven in hot fat
Baking	Placing food in dry heat in a hot oven, which cooks the food through
Grilling	Food cooked under a direct heat
Yeast	A single-celled plant fungus and a biological raising agent which needs time, food, warmth and liquid to grow and ferment
Fermentation	The process in which yeast produces the gas carbon dioxide
Mechanical raising agent	Air or steam that makes mixture rises
Whisking	Eggs or egg whites are whisked with sugar to trap bubbles in the egg white
Beating	Liquids are beaten and air bubbles are trapped in the liquid
Folding	Using a spatula or spoon to fold a light ingredient (such as egg whites) into a heavier ingredient
Sieving	Putting flour through a sieve to trap air between the flour particles
Creaming	The process of beating fat and sugar together, which traps tiny air bubbles into the mixture
Rubbing in	A technique in which fat is rubbed into flour and traps air in the mixture
Stiff peak stage	This is when egg whites are whisked and will stand in a peak with a sharp tip, and not collapse

Sauce	A well-flavoured liquid which has been thickened
Roux	A mixture of melted fat and flour, which is used as the base of a sauce
Reduction	Simmering a liquid overheat until it thickens
Gelation	When a mixture is thickened by starch, and then sets when it is chilled
Gelatinisation	The name of the process for when starch granules are mixed with a liquid and heated; they swell and break open, causing the liquid to thicken
Food miles	The distance food travels from farm to fork
Food Seasonality	Refers to the time of the year when a certain type of food is at its peak either in terms of harvest or flavour. It is the time when it is sold at its cheapest and freshest
Carbohydrates	Sugars, starches and fibres found in fruits, grains, vegetables and milk products. There are **simple carbohydrates** which are made up of no more than **2 molecules** which the body can break down fast and provide the body with fast release energy. These are foods such as cakes, pizza, bread, sugary drinks and white rice/pasta. **Complex carbohydrates** are made of **2 or more molecules** held together by bonds in long complex chains which takes the body longer to break down and keep us fuller/sustained for longer. These are foods such as wholegrains, vegetables, peas and beans.
Proteins	A nutrient found in a food that is made up of **amino acids** joined together. They are a necessary part of our diets and are important for cell structure and growth. Found in foods such as: meat, beans, nuts, lentils and pulses, eggs and cheese.
Biological Bacteria Contamination	**Microscopic living organisms** that are usually one celled which can multiply very quickly and can be found everywhere. They are dangerous as can cause infection. They can be found/produced by: - viruses, rodents, humans or pests. It is the most common cause of food poisoning worldwide
Physical Contamination	This refers to food that has been contaminated by **a foreign object** at some stage during cooking/production. They can cause harm when ingested. Examples are: plasters, small parts of machinery, fingernails and rodent droppings
Chemical Contamination	This refers to foods that have been contaminated by some type of chemical during the food production/growth and in preparation/cooking process. Examples are: - cleaning fluids, pesticides and natural toxins found in some foods
Allergenic Contamination	This refers to when foods are not properly stored or prepared correctly and may come into contact with foods that contain allergens that some people are allergic to. Examples are: nuts, eggs, fish and food containing gluten.
Food Spoilage	The process where a food product becomes unsuitable to eat when it becomes contaminated with bacteria, mould, yeast, moisture, light and heat that cause the food to 'go off'

Tier 2 Words	Definition
Range	A variety of/a number of
Describe	Identify distinctive features and give description, factual details. Unless the word states 'describe and explain', no explanations are needed for just 'describe'. Look at it as painting a picture with words.
Explain	To make it clear by describing it in more detail and revealing any relevant facts
State	A short factual answer
Compare	To identify the similarities and differences
Skills/techniques	Low/medium/high level skills which are used in the process of making a product. Specific to Food Preparation and Nutrition

Food Preparation & Nutrition

Yr9 Food – Term 2/ Spring

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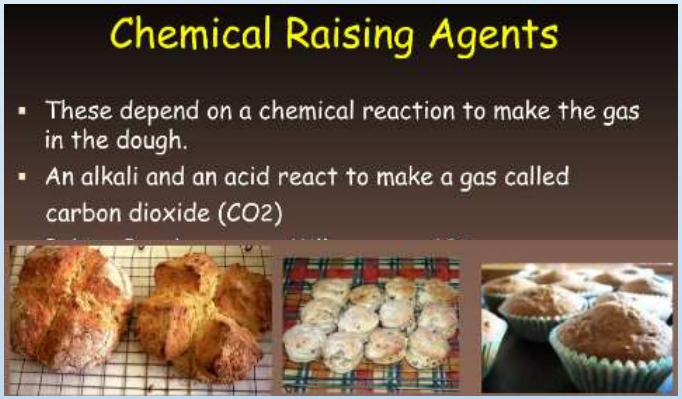
KNOWLEDGE ORGANISER

The science in baking

Rising agents:

Raising agents make bread and cakes rise in the oven so that they have a spongy texture.

Raising agents put a gas (air or CO2) in the mixture. Then, in the oven the heat makes the gas expand and pushes up the mixture. The mixture is able to stretch because of the gluten in the flour. After a while the heat in the oven sets the gluten so that the mixture keeps the risen shape. There are several types of rising agents:



Proteins:

Denaturation->the process of altering a protein's molecular characteristics or properties.

Coagulation-> The process of turning a liquid into a solid. Example: eggs

Carbohydrates:

Gelatinization->When heated a moisture thickens as starch particles absorb water. Example: white sauce.

Caramelization->Sugars change color and flavor when heated. Example: onions.

Dextrinization->Browning that happens when starches are cooked. Example: toast.

Fats:

Plasticity->The ability of fat to hold its shape or melt.

Water:

Evaporation->When water is heated, it turns into a gas.

WHAT HAPPENS WHEN FOOD IS COOKED?

Food Preparation & Nutrition

Yr9 Food – Term 2/ Spring

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KNOWLEDGE ORGANISER

Function of carbohydrates in sauces

Sauces are thickened by **gelatinisation**

Sauce Making

Sauces are liquids that are thickened and included in dishes to add moistness, nutritional value, flavor, richness and to improve the appearance of the dish

Sauces can be made using the **blended method** (cornflour is mixed with a liquid and heated) or the **roux method**.
They can be used to as a pouring or coating sauce or to bind other ingredients together

SCAN ME

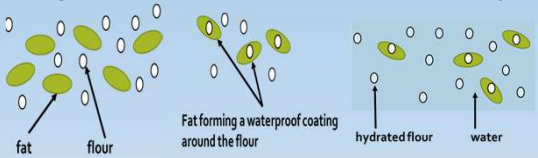
	Proportions of ingredients	Ratio	Outcome
Pouring white sauce	15g plain flour /fat 250g milk	1: 1: 16	Smooth well flavoured sauce, pours freely in thin flow
Coating white sauce	25g plain flour/fat 250ml milk	1: 1: 10	Smooth, well flavoured, thick enough to coat back of a spoon, served with cauliflower, fish, etc
Binding white sauce	50g plain flour/fat 250ml milk	1: 1: 5	Smooth, well flavoured. Very thick to hold other ingredients or bind them together, eg egg white in soufflé, dried ingredients in a meat loaf

Pouring	Coating	Binding / Panada
A **pouring** sauce, at boiling point, should just glaze the back of a wooden spoon, and should flow freely when poured.	A **coating** sauce, at boiling point, should coat the back of a wooden spoon, and should be used as soon as it is ready, to ensure even coating over the food.	A **binding** sauce or **panada** should be thick enough to bind dry ingredients together, so that they can be handled easily to be formed into croquettes, cakes etc



Function of fat in pastry

Fats have a '**shortening**' effect in pastry and biscuits. When fat is rubbed into flour it forms a waterproof coating around the flour particles which reduces the amount of water that can be mixed with the flour. When only a little water is absorbed by flour less gluten is produced and so the mixture is shortened. This shortening effect produces a crumbly, melt-in- the-mouth texture (**plasticity**).



Fats can also be used for aeration, flakiness, retention of moisture and glazing.

Fats can be:
- saturated
- unsaturated
  - Monounsaturated
  - Polyunsaturated

Carbohydrates can be divided into three groups:
- monosaccharides
- disaccharides
- polysaccharides.

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Issues of urbanisation in the UK – subject summary

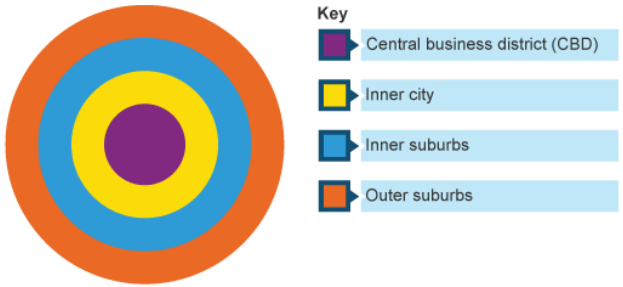
9.4.1 Describe factors which led to the growth of cities in the UK and the land use patterns within these.

A map showing the location of major cities in the UK

Factors influencing the location of urban areas in the UK:

1. **Coastal areas** have many settlements e.g. Liverpool and Southampton, this is because they can have large ports for trade.
2. **Lowland areas** e.g. Birmingham, are easy and cheap to build on, they often have milder climates.
3. **Natural resources** e.g. Newcastle and Leeds, had coal field sites, so jobs and industry.
4. **Along major rivers** e.g. London. Rivers were used for trade, a water source and defence.
5. **Bridging points** building at the narrowest, shallowest part of a river. So resources from both sides can be used. Bridging locations normally have 'ford' in their name e.g. Ox**ford.**

Land use zones of cities – a general model



1. The above model shows the **typical land use pattern** in cities.
2. In the **centre** is the **CBD**, most cities have grown outwards from here. The value of land is high, due to businesses wanting to locate here.
3. Beyond here is the **'inner city.'** This is housing developed in the **19th century**. This is close to the CBD as people walked to work and into town during the time. The houses are **terraced**.
4. The outer area is the **suburbs**. The most modern area of housing, built during the inter-war period and onwards.

CBD

1. Contains shops, offices, and restaurants.
2. Land use is commercial.
3. Centre of the city.
4. Most transport routes converge here.
5. Land value is high.

Inner city

1. Houses in lines.
2. Built in the 19th century.
3. Houses are called terraced houses.
4. No front gardens, or garages.
5. High density.

Suburbs

1. Detached homes.
2. In cul-de-sacs (a close).
3. Modern homes.
4. Low density.
5. Less pollution and crime.

Key Terms:

1. **CBD (central business district) –** The middle of a town or city where most of the shops and offices are found.
2. **Rural-urban fringe –** The area where the countryside meets a city or town.
3. **Urban dereliction/ decay –** Abandoned buildings and waste land.
4. **Urban sprawl –** Unplanned growth of urban areas into surrounding rural areas.
5. **Counter-urbanisation –** The movement of people from urban areas into villages.
6. **Land use –** What the land is used for e.g. residential, commercial, industrial etc.
7. **Function –** Similar to land use, the function of certain parts of the city e.g. residential etc.

Identify features of urban areas/ land use from OS maps:

Inner city

On an OS map look for the following:

1. Roads in **straight lines**, this is evidence of terraced housing running back to back.
2. Look to see if it is **close** to the **city centre** e.g. where lots of roads meet.

Suburbs

On an OS map look for the following:

1. On the **outskirts** of the city.
2. Small roads that come off main roads. The **small roads come to dead ends**.

Urban-rural fringe

On an OS map look for the following:

1. The **edge of the city** where it meets the countryside.
2. Look for **white spaces**, or wooded areas.
3. May contain **retail parks** or **golf courses.**

9.4.2 Explain the causes of urban change and dereliction in the UK.

The causes of urban change and dereliction in the UK:

Industrial decline/ deindustrialisation

1. Has left buildings empty in cities – **urban dereliction**.
2. The buildings are an eye sore.
3. Can lead to drug dens and crime.
4. Lack of jobs for many in the area as new industries locate on the outskirts of cities.

People move out (perceived impacts):

1. Those with money move to the **suburbs**.
2. Empty homes and crime become common in the inner city.
3. Those left behind are **poor** – urban deprivation / inequality.
4. Service such as schools and doctors suffer.
5. **High unemployment** leads to poor health and poor education.
6. Known as a **negative multiplier**

Urban sprawl as a result of urban decay:

Urban decay/ dereliction leads to pressure on the rural-urban fringe:

1. New homes away from the inner city are built.
2. This is called **suburbanisation**.
3. Land is cheaper here as it is **'greenfield.'**
4. This damages habitats and farmland.
5. There is an increase in **'commuters.'**

The urban rural fringe has certain features:

1. Golf courses.
2. Out of town shopping.
3. Modern industrial sites.
4. New housing estates.
5. Country parks.

Issues of urbanisation in the UK – subject summary

9.4.2 Explain the causes of urban change and dereliction in the UK.

Reducing urban sprawl:

As suburbanisation has taken place urban areas have **sprawled (spread) outwards**, taking over the countryside. The government has tried to stop this.

1. **Greenbelts** have been placed around cities.
2. These must not be built upon.
3. They encourage developers to re-use **brownfield land** in the inner cities, by knocking down older buildings.
4. However, this is causing people to leave the city altogether to live in rural areas, beyond the greenbelt.

Why is counter-urbanisation taking place in the UK? (perceived reasons):

1. Villages are quieter.
2. There is less crime.
3. There is less noise, visual and air pollution.
4. People can still easily commute to work

Consequences of counter-urbanisation for villages (perceived):

1. As people from cities and towns move into villages it **increases house prices**, this means local villagers cannot afford the homes.
2. There is an **increase in commuters** in the local area, leading to noise and air pollution.
3. **Parking problems** as many new comers have 2 or 3 cars.
4. Some new **homes built**, as farmers sell off land, this damages the **rural landscape**, leading to lost habitats.
5. The **village shop** may suffer as newcomers use supermarkets in the city or order shopping via internet.
6. The **local primary school** becomes full, meaning some locals struggle to get their children a place.

KPIs:

9.4.1 Describe factors which led to the growth of cities in the UK and the land use patterns within these.
9.4.2 Explain the causes of urban change and dereliction in the UK.
9.4.3 Explain the ways in which urban areas can be made more sustainable.
9.4.4 Assess the effectiveness of a regeneration project in improving life within a city.

9.4.3 Explain the ways in which urban areas can be made more sustainable.

How are urban areas trying to be more sustainable?

Waste recycling:

1. Using different coloured bins for certain waste.
2. This reduces the amount of waste going to **landfill**.
3. Less countryside destroyed.
4. Less **methane** being released from decomposing waste.

Water conservation:

1. Cities are regulating water use by using things such as **water meters** and dual flush toilets.
2. This stops water wastage.
3. Therefore, the supply is not at risk of running out.
4. It reduces the water taken from the countryside, leaving more for wildlife.

Creating green space (urban greening):

1. Encourages people to exercise leading to a **healthier lifestyle** and life expectancy improves.
2. Reduces the flood risk, as more infiltration and less surface run-off after rainfall.
3. Creates areas where **habitats can flourish**, for example wildflower verges; these support insects and reduce the chance of extinction.

Energy conservation:

1. **Renewable energies** e.g. solar and wind result in less fossil fuels being used.
2. **Less CO2** is positive in the fight against climate change.
3. **Less air pollution**, so less breathing disorders e.g. asthma.
4. **Cheaper bills** in the long run means people have more disposable cash.

Improved transport systems:

1. Improvements in public transport reduces the amount of **congestion** on the roads.
2. This means that people can get to work on time and deliveries are not late.
3. There is a **reduction in air pollution** and therefore a reduction in breathing disorders.
4. Examples include cycle lanes, bike hire e.g. Boris Bikes, trams and tube networks, bus lanes, car sharing lanes, congestion charging zones etc.

9.4.4 Assess the effectiveness of a regeneration project in improving life within a city.

Stratford regeneration, Elizabeth Park

In 2012 Stratford, in the **East End** of London, held the Olympic games, allowing regeneration of the area to take place.

The reasons for regeneration

1. In 1981 the **London docks closed**, causing massive unemployment.
2. The area suffered from **urban dereliction** (empty buildings) and decline (people with money moved away).
3. In 2010 Stratford had the **lowest educational standards** in London and the **lowest life expectancy.**

Regeneration has improved the sustainability of the area

1. **9,000 affordable homes** created, which has eased overcrowding in the area and raised aspiration.
2. **Employment** opportunities have been created in the area, for example in Westfield shopping centre, with 8,000 jobs, this creates taxes and leads to a positive multiplier in the area.
3. **Integrated transport system:** Stratford International station has been created making it easier for visitors to get to the area, this has encouraged other businesses to set up.
4. **Olympic parkland (25 acres)** added to the site, giving areas for families to relax and use for leisure, as well as benefiting the habitats in the area.
5. **Strafford energy centre** provides power in the local area, it uses household waste as fuel, meaning that the amount of waste going to landfill is reduced.
6. **Brownfield land** which has been regenerated to create the site, so less pressure on the greenfield land on the outskirts of the city.

Has it been sustainable for all?

1. **450 homes owners** forced to move, so the new infrastructure could be built, resulting in the old community being broken up.
2. **Houses in Carpenters Estate (the undeveloped part)** have been left empty, vandalism and graffiti has taken place to some.
3. **Many of the new jobs** have **not** gone to those that lost their jobs during deindustrialisation.
4. **Inequality has increased in some areas of Carpenters Estate.**

Unit 7: Shifting World Orders in the Modern World

1. How did Europe fall under the control of dictators?


Key concepts:

- The political spectrum
- Left wing
- Right wing
- Dictatorship
- Totalitarianism

Keywords:

1. **Communism -** An economic and political system in which all property is state-owned
2. **Democracy -** A political system that allows the people to vote on how the country is run
3. **Dictator -** A single strong leader who can do what they want and has complete power
4. **Fascism** - A political system that puts the strength of the nation above the individual
5. **Totalitarian -** A form of rule in which the government or leader has unlimited power over all aspects of society
6. **Autocracy -** A system of government by one person with absolute power
7. **Bolsheviks -** The radical left-wing political group which seized control of the Russian government in 1917
8. **Proletariat -** Used by communists to describe the working class
9. **Tsar -** The Russian emperor
10. **Collectivisation -** The grouping together of farms to be owned by the state
11. **Industrialisation -** The widescale development of industries in a country
12. **Purge -** To remove a group of people from an organisation
13. **Soviet Union -** Or USSR, the new name for Russia under Communist control
14. **Fuhrer -** Hitler's title from 1934, when he became the absolute ruler of Germany
15. **Police state -** A country where the government uses the police to spy on the people and stamp out opposition
16. **Weimar Republic -** The German democratic government established after WWI

Key dates:

- **1917 –** The Bolsheviks seize control of Russia
- **1919 –** Germany forced to sign Treaty of Versailles
- **1924 –** Stalin becomes leader of the Soviet Union
- **1929 –** The Great Depression
- **1933 –** Hitler becomes Chancellor of Germany
- **1934 –** Purges begin in the Soviet Union and Hitler becomes Fuhrer

2. Why was Nazism defeated?

Key people:

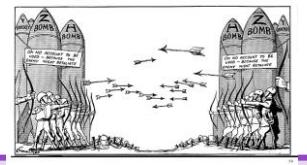
- Winston Churchill
- Dwight Eisenhower
- Franklin Roosevelt
- Stalin

Keywords:

1. **Allies - T**he alliance between Britain, the USA, the USSR and France
2. **BEF -** British Expeditionary Force
3. **Blitzkrieg -** Tactic used by Hitler meaning lightening war
4. **Axis -** The alliance that stood opposed to the allies made up of Germany, Japan and Italy
5. **Encircle -** To surround an enemy army
6. **Red Army -** Army of the Soviet Union
7. **Pincer movement -** A movement by two separate groups of troops to close in on an enemy from two different directions
8. **Isolationist -** The American policy of isolating itself from European and world affairs
9. **Lend-Lease -** A scheme under which the USA lent or leased vital supplies to Britain during the war
10. **Tariff -** A tax paid on certain imports or exports
11. **Luftwaffe -** The Nazi air forces
12. **Operation Overlord -** The allied military operation to liberate France from Nazi occupation

Key dates:

- **1 September 1939** Hitler invades Poland
- **26 May – 4 June 1940** Dunkirk evacuation
- **14 June 1940** Paris falls to the Nazis
- **22 June 1941** Hitler launches Operation Barbarossa
- **7 December 1941** Attack on Pearl Harbor
- **11 December 1941** Hitler declares war on the USA
- **September 1942-January 1943** The Battle of Stalingrad
- **6 June 1944** D-day
- **8 May 1945** End of the war in Europe



3. Why was Europe split in half?

Key people:

- 'The Big Three' – Winston Churchill, Roosevelt, Stalin
- Harry Truman

Keywords:

1. **Capitalism -** Where trade and industry are run by private individuals for profit
2. **Cold War -** A state of political hostility between countries that doesn't go quite as far as open warfare
3. **Sphere of influence -** Region of the world in which one Superpower is dominant
4. **Superpower -** An unusually strong country
5. **Containment -** The US policy of stopping Communism from spreading
6. **Satellite state -** Countries that came under direct control of the Soviet Union after WWII
7. **Arms race -** When countries compete against each other to make more and more powerful weapons
8. **Deterrent -** Something that prevents one country from attacking another
9. **Mutually Assured Destruction -** The existence of massive nuclear weapons meant that a future World War could end life on earth

Key dates:

- **February 1945** Yalta Conference
- **May 1945** Germany defeated
- **July 1945** Potsdam Conference
- **6-9 August 1945** USA drops atomic bombs
- **March 1947** Truman Doctrine announced
- **March 1948** Marshall Aid introduced
- **June 1948** Berlin Blockade

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9.08 Standard Form

1) Rule	Numbers written in standard form are always written in the form $a\times10^n$, where $0<a<10$	**2) Powers of 10**	$10^1=10$ $10^2=100$ $10^3=1000$ $10^3=10\ 000$ $10^4=100\ 000$ etc.	$10^{-1}=\frac{1}{10}=0.1$ $\quad 10^{-4}=\frac{1}{10000}=0.0001$ $10^{-2}=\frac{1}{100}=0.01$ $\quad$ etc $10^{-3}=\frac{1}{1000}=0.001$
3) Ordinary to Standard Form	$340000 = 3.4\times10^5$ $0.00903=9.03\times10^{-3}$	**4) Standard Form to Ordinary**	$1.09\times10^3 = 1090$ $8.77\times10^{-6} = 0.00000877$	

KPI 9.09 Expanding and Factorising 2

1) Expand	Multiply out the bracket(s) in the expression. E.g. $3(5x + 7) = 15x + 21$	**2) Factorise**	Identify the HCF and rewrite the expression with brackets. E.g. $6x^2 + 9x = 3x(2x+3)$.
3) Expanding double brackets	Writing two brackets next to each other means the brackets need to be multiplied together. $(x + 1)(x +2)=(x + 1)\times(x + 2)= x^2 + 3x + 2$ Note: $(x + a)^2=(x + a)(x + a)$		
4) Factorising quadratics	To factorise a quadratic, put it back into a pair of brackets. To find the terms that go in each bracket, look for a pair of numbers which multiply to give the constant and add together to give the coefficient of x		
5) Difference of two squares (DOTS)	$a^2 - b^2 = (a+b)(a-b)$	E.g. $x^2 - 16 = (x + 4)(x - 4)$	

x	x	+1
x	x^2	$+x$
+2	$+2x$	+2

KPI 9.10 Forming Expressions and Substitution

1) Substitution	Replace a variable with a given value.	**2) Function machine**	Shows the relationship between two variables, the input and the output.
3) Formula	A mathematical relationship or rule expressed in symbols.		
4) Expression	A mathematical statement which contains one or more terms combined with addition and/or subtraction signs.		

KPI 9.11 Direct and inverse proportion

1) Direct proportion	A relationship between two variables where, as one increases, the other also increases.	**3) Unitary method**	To find the value of one unit first.
2) Inverse Proportion	A relationship between two variables where, as one increases, the other decreases.	**4) Exchange rate**	Tells us how much of one currency you can exchange for another currency e.g. £1 = $1.39

KPI 9.12 Probability 1

1) Probability

How likely something is going to happen.

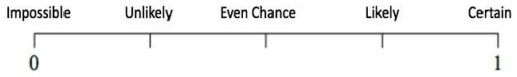
All probabilities must be given as a fraction, decimal or a percentage (NOT a ratio).

2) Probability scale words

Impossible, Unlikely, Even chance, Likely, Certain

3) Probability scale

All probabilities exist between 0 and 1.
Impossible = 0, Even chance = ½ and certain = 1



4) Systematic listing

The outcomes for an event can be listed in an organised or systematic way to make sure that none of the possible outcomes are missed out.

5) Single event probability

The sum of the probabilities of a set of outcomes must equal one.

6) Probability notation

In probability we use the notation P(___) to represent the probability of something happening.

7) Probability of an event happening

$$P(of\ an\ outcome\ happening) = \frac{number\ of\ the\ desired\ outcome}{total\ number\ of\ outcomes\ of\ the\ event}$$

8) Mutually exclusive

Are events that cannot happen at the same time.

9) Expected outcomes

You need to multiply the probability by the total number of trials.

10) Frequency trees

Is used to record and organise information given as frequencies.

This can then be used to calculate probabilities.

11) Sample space

Listing all of the possible outcomes from two events in a table.

E.g. Displaying all of the scores for the sum of two spinners. Spinner A (1,2,3,4) and Spinner B (2,3,4)

+		Spinner A			
		1	2	3	4
Spinner B	2	3	4	5	6
	3	4	5	6	7
	4	5	6	7	8

12) Relative frequency

Relative frequency is used when probability is being estimated using the outcomes of an experiment or trial, when theoretical probability cannot be used.

Relative frequency or experimental probability is calculated from the number of times an event happens, divided by the total number of trials in an actual experiment.

$$Relative\ Frequency = \frac{No.\ of\ Successful\ Outcomes}{No.\ of\ Trials}$$

Knowledge Organiser| Life and Death

1	**Morality**	Principles concerning the distinction between right and wrong or good and bad behaviour.
2	**Ethics**	Moral principles that govern a person's behaviour or the conducting of an activity.
3	**Sanctity of Life**	The view that all life is sacred because it is made by God.
4	**Quality of Life**	The standard of health, comfort, and happiness experienced by an individual or group.
5	**Rules**	One of a set of explicit or understood regulations or principles governing behaviour.
6	**Natural Moral Law**	A system of laws based on close observation of human nature, given to humans by God.
7	**Precept**	A general rule intended to regulate behaviour or thought.
8	**Reason**	The power of the mind to think, understand, and form judgements logically.
9	**Absolute**	A value or principle which is regarded as universally valid.
10	**Situation Ethics**	The view that there should be flexibility in the application of moral laws according to circumstances.
11	**Relativism**	The view that morality exists in relation to culture, society, or historical context, and is not absolute.
12	**Agape**	Unconditional love, "the highest form of love, charity" and "the love of God for man and of man for God“.
13	**Abortion**	A procedure to end a pregnancy.
14	**Pro-Life**	Opposing abortion and euthanasia.
15	**Pro-Choice**	Advocating the legal right of a woman to choose whether or not she will have an abortion.
16	**Euthanasia**	The painless killing of a patient suffering from an incurable and painful disease or in an irreversible coma.
17	**Capital Punishment**	The legally authorized killing of someone as punishment for a crime.
18	**Animal Rights**	the rights of animals to live free from human exploitation and abuse.
19	**Dominion**	To be in charge of something or rule over it.
20	**Stewardship**	The job of supervising or taking care of something.

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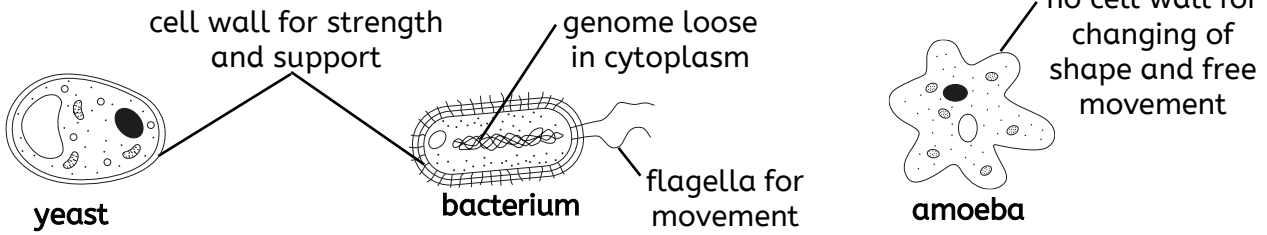
Organ systems

Unicellular organisms are made of only one cell (e.g. bacteria, amoeba and yeast).

- They can carry out the 7 life processes of living organisms, all in one cell.
- Unicellular organisms share common organelles, but they also have adaptations.
- Unicellular organisms can be helpful or harmful.
- Unicellular organisms use diffusion to exchange substances.



- Used in baking
- Used to make alcoholic drinks

- Supports digestion
- Used to make cheese and yoghurt

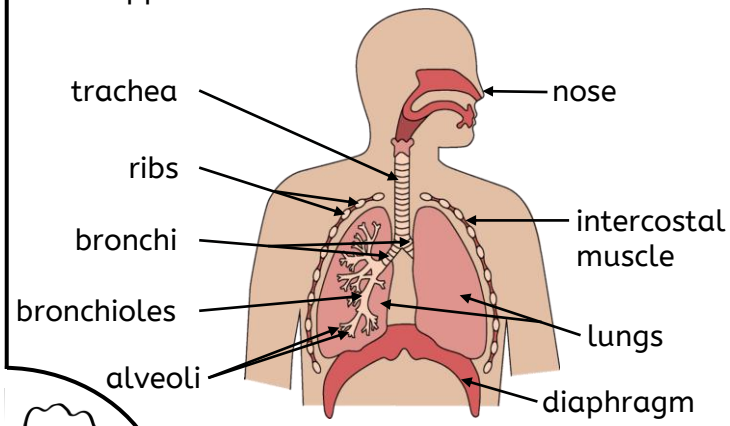
Multicellular organisms are made of many cells (e.g. plants and humans).

- They are larger and more complex than unicellular organisms.
- They cannot rely on diffusion alone for exchanging substances.
- Multicellular organisms depend on tissues, organs, and organ systems working together to exchange and transport substances to cells of the body, to keep cells alive.
- Organ systems in humans include the **gas exchange system**, **digestive system**, **circulatory system**, **skeletal system** and **muscular system**.

Gas exchange system

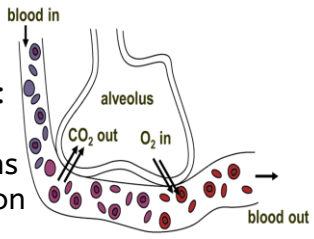
Air is a mixture of gases, including oxygen and carbon dioxide.

The human gas exchange system allows for the exchange of oxygen and carbon dioxide between an organism and its environment. Inhaled air contains more oxygen than exhaled air. Exhaled air contains more carbon dioxide than inhaled air. Oxygen moves from the alveoli into cells and then into the blood vessels (capillaries), while carbon dioxide moves in the opposite direction via diffusion.



Alveoli are adapted for efficient diffusion:

- **good blood supply** maintains the concentration difference
- **large surface area** for faster rate of diffusion
- **thin walls** (one cell thick) to provide a shorter diffusion pathway



Breathing involves changes in pressure and volume inside the chest, helped by the movement of intercostal muscles and diaphragm, which causes the movement of the ribcage.

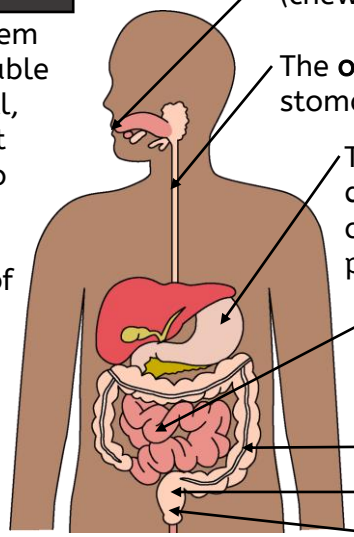
Vital capacity is the maximum volume of air exhaled after inhaling fully and can be used to estimate lung volume.

	Inhalation	Exhalation
Intercostal muscles	contract	relax
Ribcage	pulled up and out	released down and in
Diaphragm	contracts and moves downwards	relaxes and moves upwards
Volume in the chest	increases	decreases
Pressure in the chest	decreases	increases
Movement of air	into the lungs	out of the lungs

Organ systems

Digestive system

- The human digestive system breaks down large, insoluble food molecules into small, soluble molecules so that they can be absorbed into the blood.
- **Mechanical digestion:** the physical breakdown of food into smaller pieces.
- **Chemical digestion:** the use of chemical substances to break food down into smaller molecules.



The **mouth** performs both mechanical digestion (chewing) and chemical digestion (saliva).

The **oesophagus** connects the mouth to the stomach and uses peristalsis to push food down.

The **stomach** performs both mechanical digestion (muscular tissue contracts) and chemical digestion (glandular tissue producing chemical substances).

The **small intestine** breaks down food chemically. Absorption of digested nutrients also happens here.

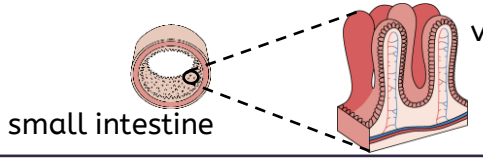
The **large intestine** reabsorbs water from undigested food back into the blood.

Faeces (poo) are stored in the **rectum**.

Faeces and waste gases are egested from the **anus**.

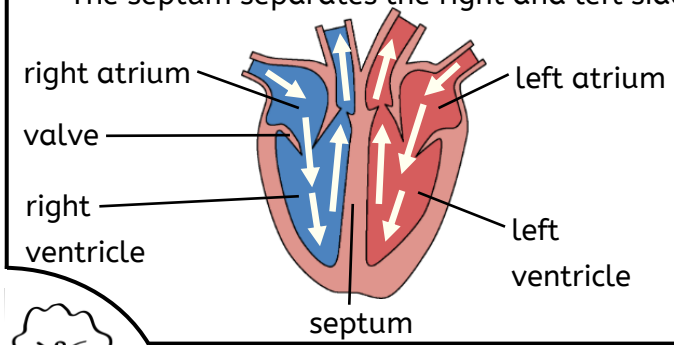
Adaptations:
The small intestine is covered in many villi for efficient absorption by diffusion:

- villi provide a **large surface area** for faster rate of diffusion
- villi have **good blood supply** to maintain the concentration difference
- villi have **thin walls** (one cell thick) to provide a shorter diffusion pathway

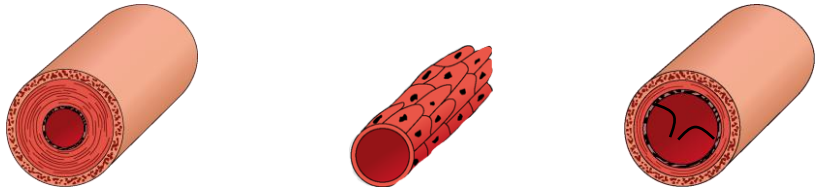


Circulatory system

- The circulatory system transports useful molecules and waste around the body. The human circulatory system consists of the heart, blood and blood vessels.
- The heart has four chambers: two atria and two ventricles.
- Valves ensure blood flows in the right direction.
- The septum separates the right and left sides of the heart.



The heart pumps oxygenated blood from the lungs to the body and deoxygenated blood from the body to the lungs (double circulatory system).

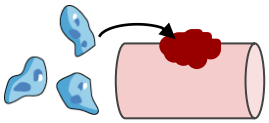


Arteries	Capillaries	Veins
• Blood taken away from heart • High pressure blood • Thick muscular and elastic walls • Small lumen	• Exchange substances between blood and cells • Very low pressure blood • Very thin walls (one cell thick) • Very small lumen	• Blood brought back to heart • Low pressure blood • Thin walls • Large lumen • Valves prevent back flow

Organ systems

Circulatory system (continued)

Blood is a fluid that transports substances, useful molecules and waste around the body. Blood helps the body to defend against diseases and to form scabs to heal cuts.



Platelets help with blood clotting for wound healing.

Plasma carries the other blood parts, nutrients, waste and carbon dioxide. It is yellow coloured and mostly water.

Red blood cells carry oxygen to all the cells of the body.

White blood cells help defend against disease.

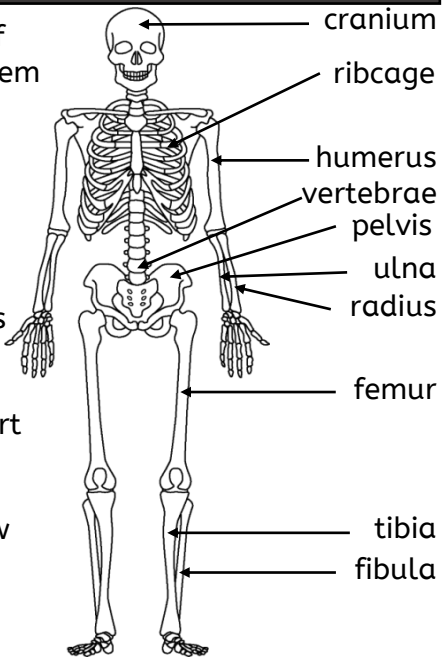
Adaptations of the red blood cells:

- biconcave shape →large surface area for faster oxygen diffusion
- contains haemoglobin → carry oxygen
- no nucleus → space for more haemoglobin → more oxygen

Red blood cells, white blood cells and platelets are made in the **bone marrow** - soft tissue inside large bones protected by the hard part of the bone around it.

Skeletal system

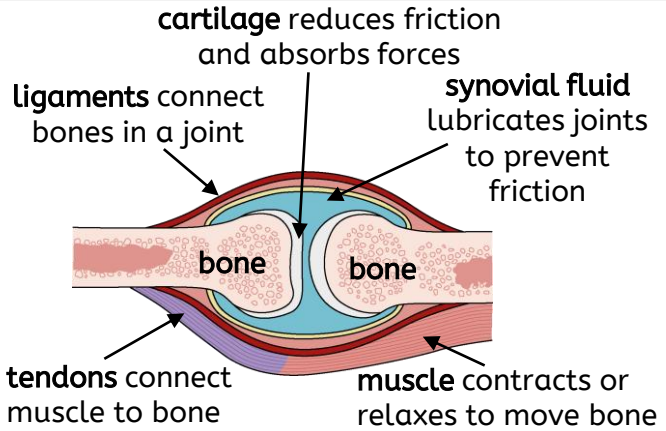
Four functions of the skeletal system are **support**, **movement**, **making new blood cells** and **protection** of organs (e.g. the cranium protects the brain and the ribcage protects the heart and lungs). **Bones** are living tissues that grow and change.



Joints, muscles and movement

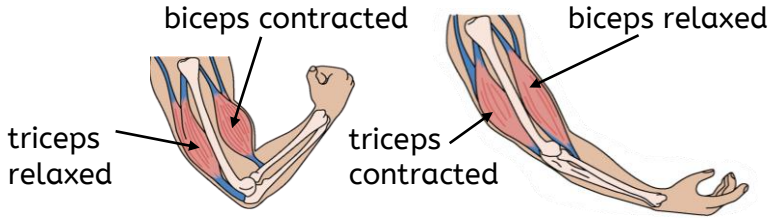
A joint is the point where two or more bones meet in the body. Joints connect bones and allow the body to move and bend. Different joint types allow various movements:

- **hinge** joint: movement backwards and forwards e.g. the knees and elbows
- **ball-and-socket** joint: movement in many directions e.g. the hips and shoulders
- **pivot** joint: twisting movement around a fixed point e.g. the neck
- **fixed** joint: does not allow for any movement e.g. in the cranium



Ageing can lead to joint wear, inflammation and arthritis. Arthritis causes joint pain and affects synovial fluid and cartilage.

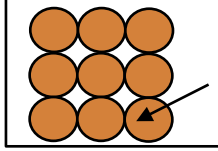
- Muscles can **only** pull, they **cannot push**;
- Muscles work in **antagonistic muscle** pairs. When one muscle contracts to pull the bone in one direction, the other muscle relaxes to allow movement.



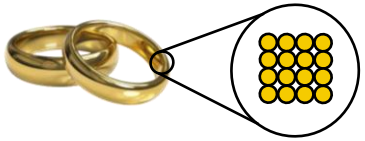
- The way in which muscles and bones work together to exert forces is called **biomechanics**.
- **Muscle strength** varies based on muscle size, age, sex, training, nutrition and injury.

Chemical changes

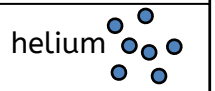
Atom
The smallest particle of matter, which all things are made of.



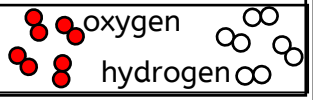
Element
A pure substance that is made of only one type of atom. All atoms of an element are identical, e.g. Gold is an element made up of gold atoms only. The 118 known elements are listed on the periodic table of elements.



The atoms of some elements do not join together, but instead they stay as separate atoms, e.g. helium.



The atoms of other elements join together to make **molecules**, e.g. oxygen and hydrogen.



Properties of elements

Individual atoms do not have the properties of the element. The properties of an element are because of the arrangement and behaviour of the atoms as a group.

Metals	Non-metals
most are shiny	most are dull
most are hard	solid non-metals are soft and easy to cut, **except carbon as diamond**
most are strong	most are not strong
most are sonorous (makes a ringing sound when hit)	most are not sonorous
malleable (easy to reshape without breaking)	not malleable
most are ductile (can be drawn out into a long wire without breaking)	not ductile
most have very high melting and boiling points	most have very low melting and boiling points
some but not all are magnetic	not magnetic
conduct electricity	non-metals do not conduct electricity, **except carbon as graphite**
good at conducting heat	poor at conducting heat

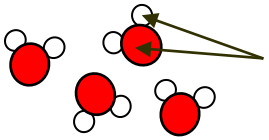
Writing element symbols

The first letter is always written as a capital letter and if there is a second letter, it is always written as a lowercase letter. Element symbols make writing elements easier and allow scientists all over the world to communicate and write about them.

Na	O
sodium	oxygen

Chemical changes

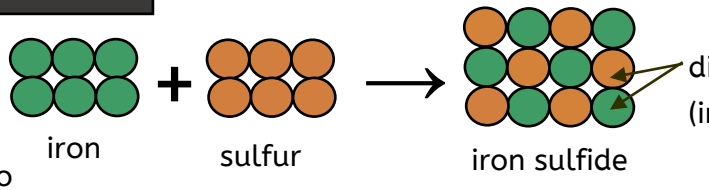
Compound
A substance made of two or more different elements chemically joined (bonded) together.
A chemical bond is a strong force that holds atoms together in a compound. Lots of energy is needed to break a chemical bond. A compound cannot be easily separated.
A compound may have very different properties to those of the elements from which it is made.
Water is a compound of hydrogen and oxygen.
Each of its molecules contains two hydrogen atoms and one oxygen atom.



water

Chemical reactions

When chemicals react, the atoms are rearranged. For example, iron reacts with sulfur to make iron sulfide. Iron sulfide, the compound formed in this reaction, has different properties to the elements it is made from.



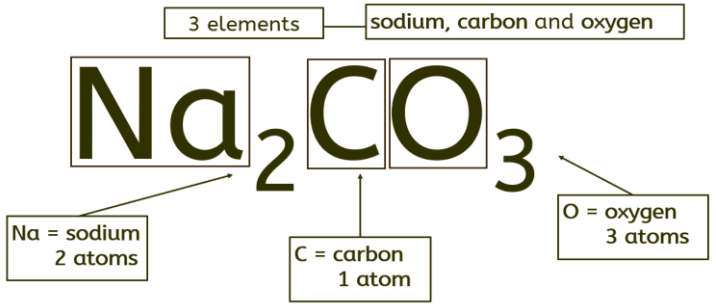
	iron	sulfur	iron sulfide
Type of substance	element	element	compound
Colour	silvery grey	yellow	black
Is it attracted to a magnet?	yes	no	no

Conservation of mass

Atoms are not destroyed nor created during chemical reactions, so in any reaction:
Total mass of reactants = total mass of products

Chemical formulae

A chemical formula uses chemical symbols and numbers to show how many of each atom is present in a compound. The small numbers (subscript) go at the bottom.
For example:
CO_2 is correct;
CO2 and CO^2 are wrong.



The formula for sodium carbonate is Na_2CO_3. It tells you that sodium carbonate contains two sodium atoms (Na x 2), one carbon atom (C) and three oxygen atoms (O x 3).

Naming metal and non-metal compounds
The metal element (furthest left on the periodic table) comes first in the name of the compound. The ending for the non-metal is shortened and changed to '–ide'. E.g. iron + sulfur → iron sulfide

Naming three element compounds containing oxygen
The metal element (furthest left on the periodic table) comes first in the name of the compound. If there are three elements in the compound, and one of them is oxygen, the ending of the non-metal is shortened and changed to '–ate'. E.g. lithium + nitrogen + oxygen → lithium nitrate

Chemical changes

Chemical equations

We summarise chemical reactions using equations:

reactants → products

- **Reactants** are shown on the **left** of the arrow;
- **Products** are shown on the **right** of the arrow.

Do not write an '=' sign instead of an arrow.

If there is more than one reactant or product, they are separated by a '+' sign. For example:

copper + oxygen → copper oxide

Reactants: copper and oxygen
Products: copper oxide

A **word equation** shows the names of each substance involved in a reaction and **must not include any chemical symbols or formulae.**

Oxidation reactions

In oxidation reactions, a substance gains oxygen. Metals and non-metals can take part in oxidation reactions (be oxidised).

Magnesium reacts with oxygen to form magnesium oxide:
magnesium + oxygen → magnesium oxide
$2Mg(s) + O_2(g) \rightarrow 2MgO(s)$

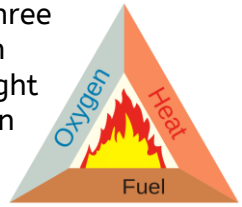
Carbon reacts with oxygen to form carbon dioxide:
carbon + oxygen → carbon dioxide
$C(s) + O_2(g) \rightarrow CO_2(g)$

Another example is a combustion reaction, where we burn fuels in oxygen:

Fuel + oxygen → carbon dioxide + water

methane + oxygen → water + carbon dioxide

- Combustion is another name for burning fuels.
- It is an exothermic reaction.
- The fire triangle shows three components which, when combined, provide the right conditions for combustion to happen.



Thermal decomposition reactions

This is the breaking down of a substance, using heat, to form two or more products. It is an endothermic reaction.
Many metal carbonates take part in thermal decomposition reactions. For example, copper carbonate:

copper carbonate is green; copper oxide is black.
copper carbonate → copper oxide + carbon dioxide
$CuCO3(s) \rightarrow CuO(s) + CO_2(g)$

Exothermic and Endothermic reactions

- **Exothermic** reaction - **transfers** energy to the thermal store of the surroundings. This causes a **rise** in temperature (**positive** temperature change).
- Hand warmers transfer energy to the thermal store of the surroundings by an exothermic oxidation reaction.
- **Endothermic** reaction – **transfers** energy in from the thermal store of the surroundings. This causes a **drop** in temperature (**negative** temperature change).
- Sports injury packs transfer energy from the thermal store of the surroundings by an endothermic reaction.

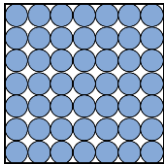
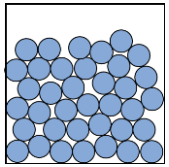
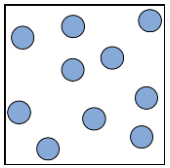
Temperature data collected from exothermic and endothermic reactions can be improved by:

- Using a **polystyrene cup** as an insulator, as it reduces energy transfers to or from the surroundings.
- Using a **lid** to reduce energy transferred from the surface.
- Using a **digital thermometer**, which is easier to read than a regular thermometer and, if it measures in decimal places, also has better resolution.

State symbols in chemical formulae provide information about the physical state of the reactants and products.
(s) – solid , (l) – liquid, (g) – gas, and (aq) – aqueous solution (i.e. dissolved in water).
The state symbol comes after the chemical formula and is written in lower case and in brackets. E.g. $CuCO_3(s) \rightarrow CuO(s) + CO_2(g)$

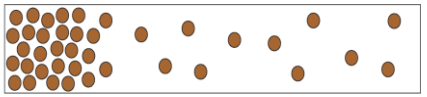
Particles, substances and mixtures

The particle model of matter

	Solid	Liquid	Gas
Diagram			
Arrangement	ordered and all touching	random and all touching	random and not touching
Movement	vibrate in fixed positions	move and slide over each other	move around quickly in random directions
Attraction between particles	strong	weak	very weak

Diffusion

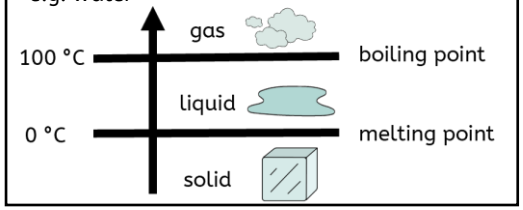
Diffusion is the random movement of particles from an area of high concentration to an area of low concentration. Particles of substances in the liquid and gas states can diffuse because their particles can move freely.



Melting and boiling points

melting point: the temperature at which a substance changes from a solid to a liquid

boiling point: the temperature at which a substance changes from a liquid to a gas, e.g. water



Explaining the properties of solids

Property	Reason
Fixed shape and cannot flow	Strong forces of attraction between the particles keep them in fixed positions.
Cannot be compressed (squashed)	Particles are all touching and have no space to move into.

Explaining the properties of liquids

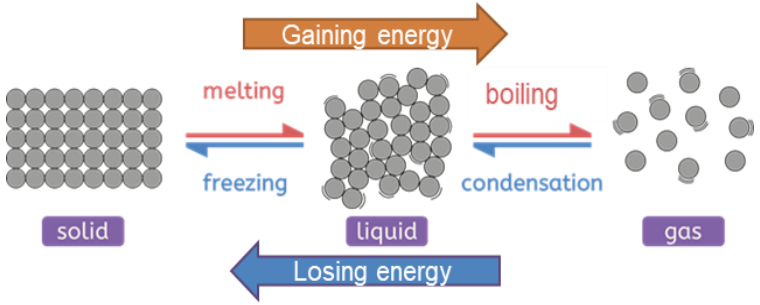
Property	Reason
Takes shape of container and can flow	Weak forces of attraction between the particles, so they can move around each other.
Cannot be compressed (squashed)	Particles are all touching and have no space to move into.

Explaining the properties of gases

Property	Reason
Takes shape of container and can flow	Very weak forces of attraction between the particles, allowing them to move and spread out.
Can be compressed (squashed)	Particles are not touching and have space to move into.

Change of state

A change of state is a physical change because no new substances are made, and the change is reversible. Only the amount of energy the particles have changes, which affects the arrangement and movement of the particles. Temperature stays constant during a change of state.



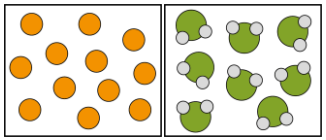
Gas pressure

When gas particles collide with the walls of their container, this creates a constant force on the walls of the container.
This causes pressure. The faster the particles move, the higher the gas pressure. The gas pressure inside containers can be increased by adding more particles or increasing the temperature. The more frequent the collisions, the higher the gas pressure.

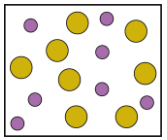
Particles, substances and mixtures

Pure substances and mixtures

A **pure substance** is one that contains only one substance, e.g. pure iron contains only iron particles. A **mixture** contains two or more substances that are not joined together and can be physically separated.



pure substances
(one type of particle)



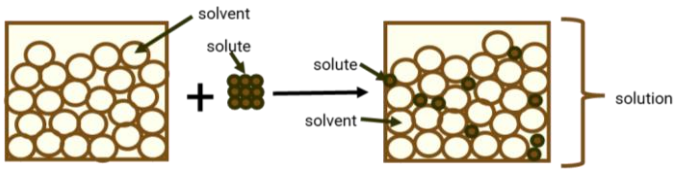
mixture

Solutions and solubility

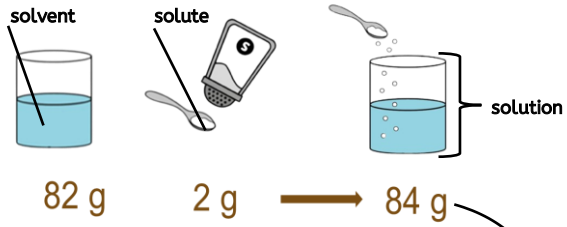
A **solute** can be dissolved in a **solvent**. The mixture created is called a **solution**. When no more solute can dissolve in the solution, it is a **saturated** solution. If a solid dissolves in a solvent, it is **soluble**. If it does not dissolve in a solvent, it is **insoluble**. **Solubility** is a measure of how much solute can dissolve in a solvent. The higher the temperature of the solvent, the greater the mass of the solute that can be dissolved.

Solubility is different for different solutes. The solubility of a solute will change depending on the solvent used.

During **dissolving**, the solute particles are separated and fit between the solvent particles to make a solution.



mixture



Conservation of mass

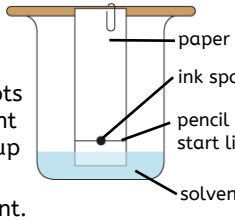
When a solution is formed, **the mass of the solvent + the mass of the solute = the mass of the solution.**

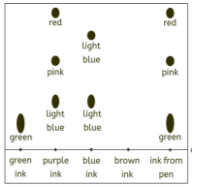
Mass remains constant because the number of particles is the same before dissolving as it is after.

Separating mixtures

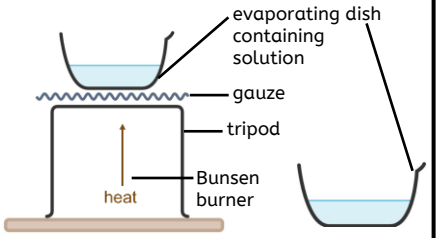
We can separate mixtures in different ways depending on their properties:

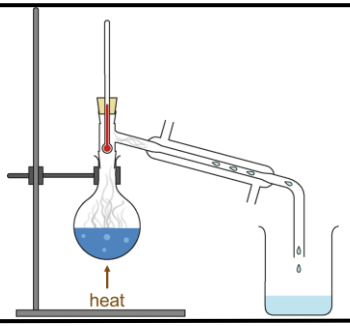
Chromatography is a separation technique that separates mixtures containing more than one solute based on their solubilities in a solvent. It works because some of the coloured substances dissolve better than others, so they travel further up the paper. A pencil line is drawn, and spots of ink or dye are placed on it. There is a container of solvent (e.g. water or ethanol). As the solvent continues to travel up the paper, the different coloured substances spread apart. A **chromatogram**, the results of chromatography experiment.





Evaporation and **crystallisation** can be used to separate a soluble solid from a solution. For example, copper sulphate is soluble in water – its crystals dissolve in water to form a copper sulphate solution. During evaporation, the water evaporates away, leaving solid copper sulphate crystals behind. Crystallisation produces larger solid crystals.

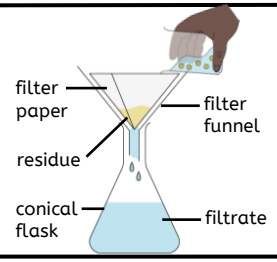




Distillation is a separation technique used to separate a mixture of liquids. The basis for separation in distillation is the difference in the boiling points of the components. For example, water can be separated from an ink and water solution because water has a much lower boiling point than ink. When the solution is heated, water evaporates. It is then cooled and condensed into a separate container. The ink does not evaporate, so it stays behind.

Filtration can be used to separate a liquid from an insoluble solid. The filter paper used in filtration is 'selectively permeable', meaning that it has holes in it that allow the movement of only some substances through whilst preventing the movement of others. The insoluble solid is unable to pass through the small holes of the filter paper. When a mixture of sand and water is filtered:

- The sand stays behind in the filter paper (it becomes the **residue**).
- The water passes through the filter paper (it becomes the **filtrate**).

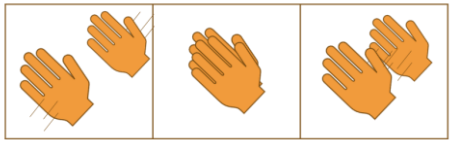


7.02: Fundamentals in physics

Forces and their interactions

Interaction:

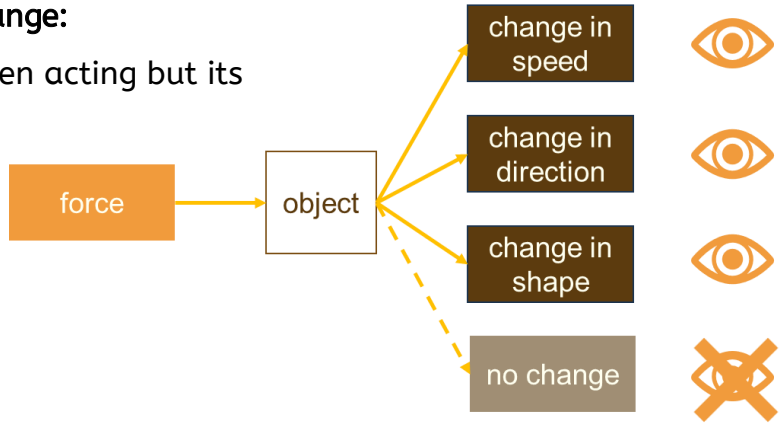
When two objects influence each other and cause a pair of forces to arise.



one force on each object — equal in size — opposite in direction

Forces can cause change:

A force cannot be seen acting but its effects often can.



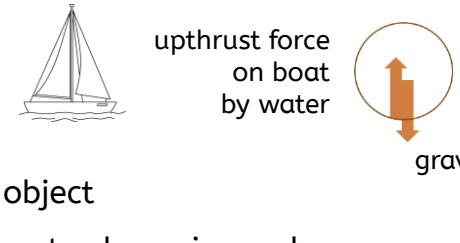
Forces can be contact or non-contact:

Contact forces arise between two touching objects.

Non-contact forces can act between two objects at a distance.

contact	thrust, friction, air resistance, water resistance, normal contact, upthrust
non-contact	gravity force, magnetic force

Free-body force diagrams



One object

Arrows to show size and direction of forces

Labelled forces:

- What kind of force is acting?
- What is the force acting on?
- What exerts the force?

Deforming forces

Two pushing forces cause compression: the object contracts.

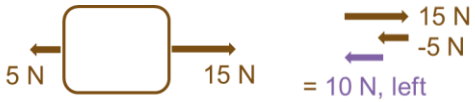
Two pulling forces cause tension: the object extends.

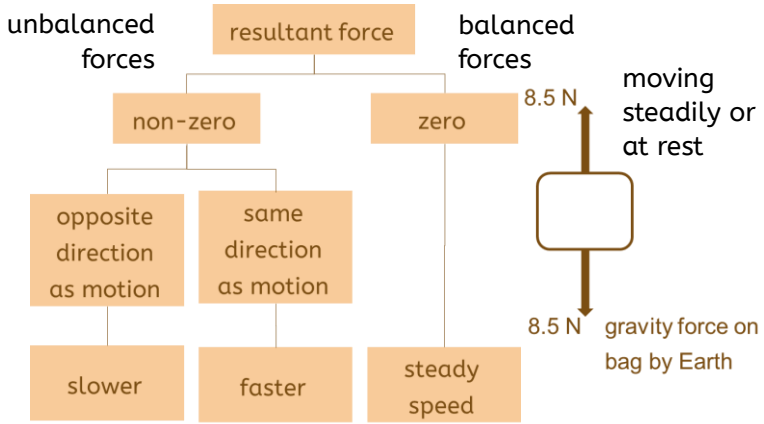
.02: Fundamentals in physics

Combining forces

More than one force acting:

- Their effects are combined
- As if a single force is acting: the resultant force

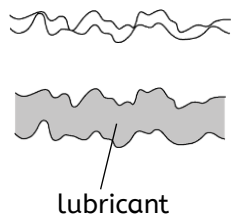




Friction force

- **What?** One of three frictional forces. They act to resist motion.
- **Where?** Acts between solid surfaces, along the surfaces.
- **When?** An object is sliding or trying to. When starting to slide, the applied force must be larger than the limiting friction: so, an unbalanced force acts.
- **How?** Opposite direction to the motion, or the applied force.
- **Why?** Surfaces are uneven, so the 'catching' between them must be overcome.

	Useful	Nuisance
Walking	✓	
Machines		✓
Driving	✓	
Wear and tear		✓

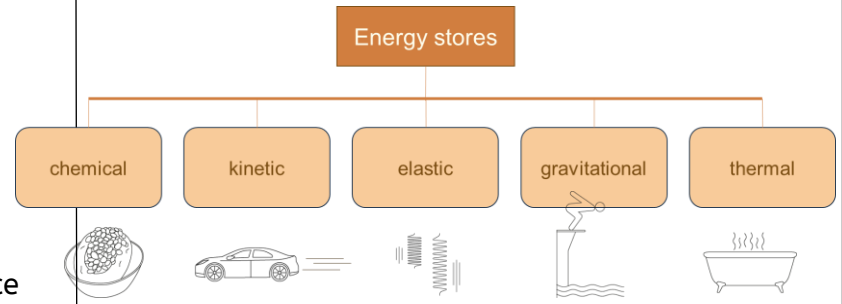


Energy stores and pathways

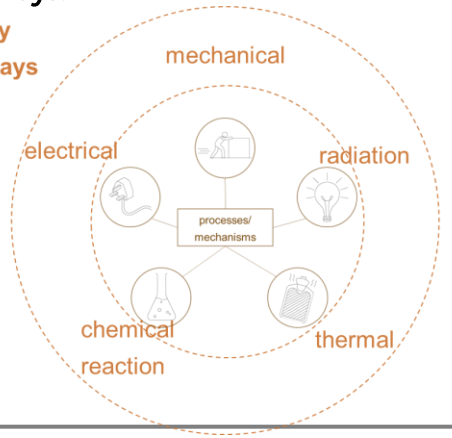
What energy does:

- Flows between objects in a system
- Stays the same when it transfers
- Cannot be used up

Energy is transferred between stores:



Energy is transferred because of processes, by pathways:

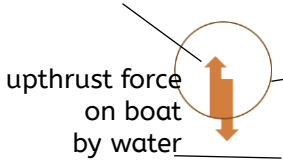


7.02: Fundamentals in physics

Modelling forces

Forces are modelled because:

- forces cannot be seen acting
- there are many forces acting at a time
- their size and direction have important effects on situations, so need to be shown.



Investigating forces

Scientific methods:

- With or without hypothesis
- Manipulating variables or not

Statement to answer an enquiry question.

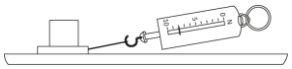
comparative term — Smoother surfaces cause less friction to act on objects sliding over them. — present tense

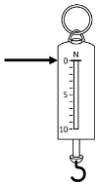
the effect which can be tested

'group' being tested (IV)

Planning to collect high-quality data:

- Measuring with skill
- Preparing the data table
- Repeatable data





Check force-meter is on zero with no force.

headings describe variable

IV

Surface	Force to start sliding (N)		
	1	2	3
Glass	1.4	1.5	1.7
Metal	1.5	1.6	1.7
Polished wood	2.0	2.3	2.2
Plastic	2.9	3.0	2.9
Paper	4.5	3.8	4.0

DV in columns

repeated

Peer review: ★★★

Peers (people of a similar level of knowledge) test the results for quality.

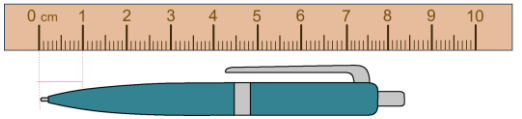
Repeatability: Same group, same results

Reproducibility: Different group, same results

Observing by measurement

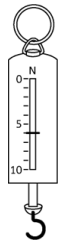
Using a scale

- set of lines at equal increments
- Labelled with numbers and units



Measuring instruments

- Include rulers, balances, clocks and thermometers.
- Force is measured using a force-meter.



Quantities: and their units

Base quantities: length (m), mass (kg), time (s) and temperature (K).

Derived quantities include force (N).

Intentionally Blank

Year 9

Term 4

Contents

MOBILE APP DEVELOPMENT KNOWLEDGE ORGANISER

COMPUTATIONAL THINKING

DECOMPOSITION
Breaking down a problem into smaller chunks. This makes it more manageable and easier to understand.

1

PATTERN RECOGNITION
Looking carefully in lines of code for patterns, similarities and trends.

2

ABSTRACTION
Filtering out and focusing on what is important. Ignoring what is not important.

3

ALGORITHM DESIGN
A plan and step by step instructions on how to solve the problems.

4

DEBUGGING
Looking through your program to find errors and then fixing them.

5

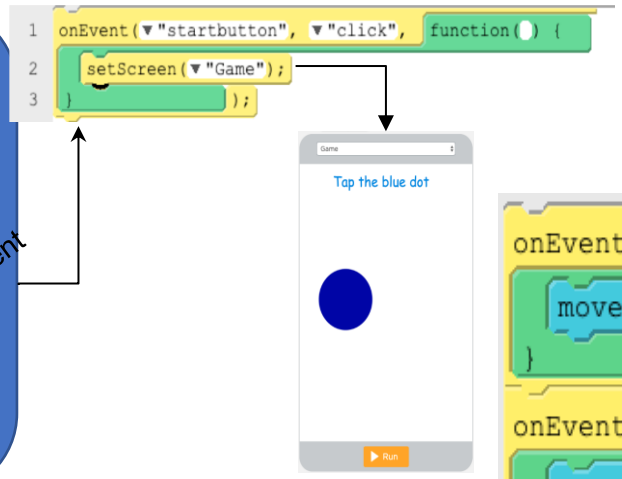
EVENT DRIVEN PROGRAMMING

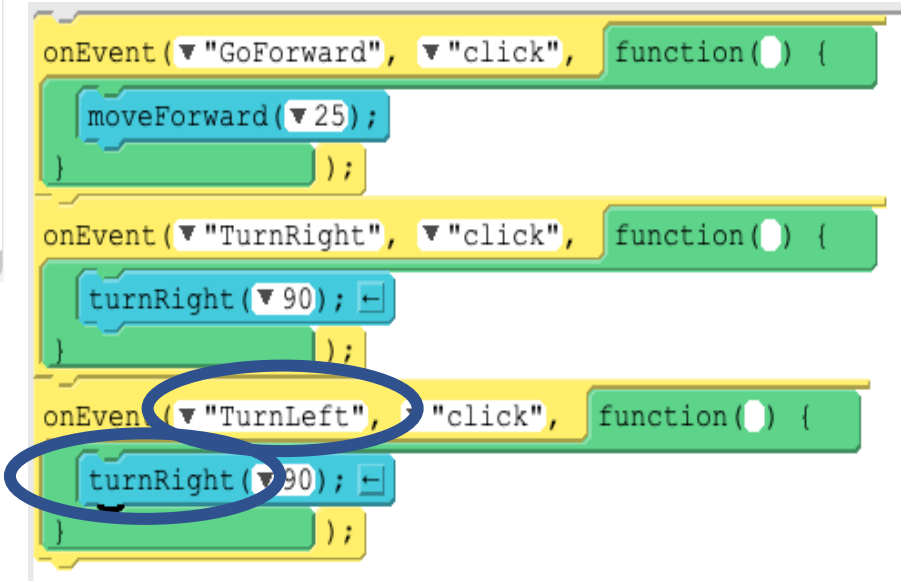
User action such as:

- Mouse clicks
- Touchscreen
- Key presses
- Hovering over a picture
- Voice input (“OK Google”, Siri, Alexa)

Events can also be triggered by:

- Sensors (e.g. if movement is sensed turn the light on)
- Messages from other programs





PAIR PROGRAMMING

The driver: To control the keyboard and mouse and place the code blocks into the correct places.

The navigator: To help support the driver by watching for any mistakes, reading instructions to the driver, and seeking support if needed.

USER INPUT

Text boxes – allowing the user to input a string.

Checkboxes - allowing for the user to indicate a yes or no response.

Button – linked to an event that will capture and process the data when it is clicked

GETTEXT

getText ("id") is a built-in subroutine that collects the text entered into a textbox; “id” is to be replaced with the name given to the text box.

```
var x = getText("id");
```

VARIABLE (VAR)

Sometimes we need computers to remember the information we give it and that it calculates during programs. **A** variable **can be thought of as a box that the computer can use to store a value**. The value held in that box can change or ‘vary’.
A program can use as many variables as it needs it to.

A variable can store letters, integers (numbers) or text.

For example:

```
>>> money_in_bank = 20
>>> total_money = money_in_bank + 10
>>> print(total_money)  30
```

SELECTION – BOOLEAN LOGIC (IF/ELSE/ELIF)

Selection is the process of making a **decision** based on a **condition**. Selection allows you to add more avenues and routes to your coding.

```
if (score > 10) {
  setText("feedback_label", "Great Work");
} else if (score > 6) {
  setText("feedback_label", "Not Bad");
} else {
  setText("feedback_label", "Hard Luck");
}
```

EVENT HANDLER

You can use an **event handler** to determine when to collect the data and what to do with it once it has been collected and linked with a variable.

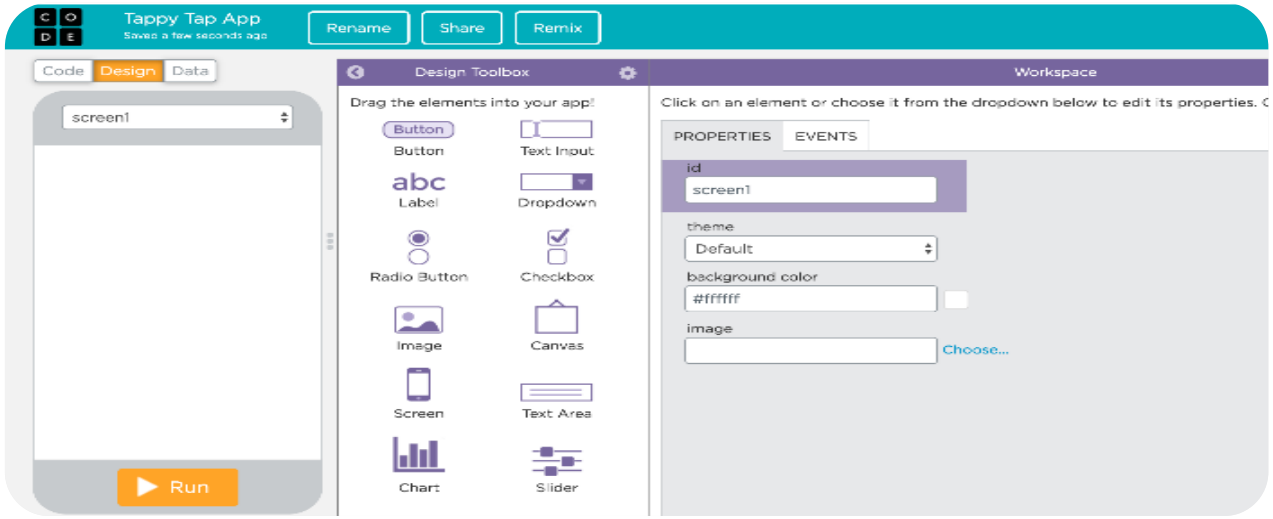
```
onEvent("login", "click", function() {
  var username = getText("username");
});
```

EVALUATION

Verb

“To **judge** or **calculate** the quality, importance, amount, or value of something”

GRAPHICAL USER INTERFACE (GUI)



Practical Rotation

Knowledge Organizer – Year 9 DT

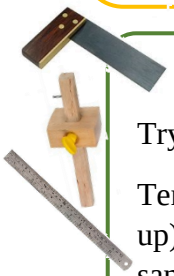
Materials Used:

Pine: a natural softwood from the evergreen Scots Pine tree

MDF: An engineered board, manufactured in sheets from wood dust & glue

Acrylic: A thermoplastic material; comes in many colours & easily cut or melted.

HIPs: High Impact Polystyrene – another thermoplastic, used with a mirrored finish on this project.



Tools Needed for this Project:

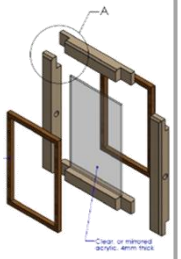
Try Square, marking gauge, steel ruler

Tenon Saw, mallet, chisels (6mm & up), smoothing plane, pillar drill, belt sander.

Key Vocab; "Sub-Assembly":

We know an assembly is a number of parts put together.

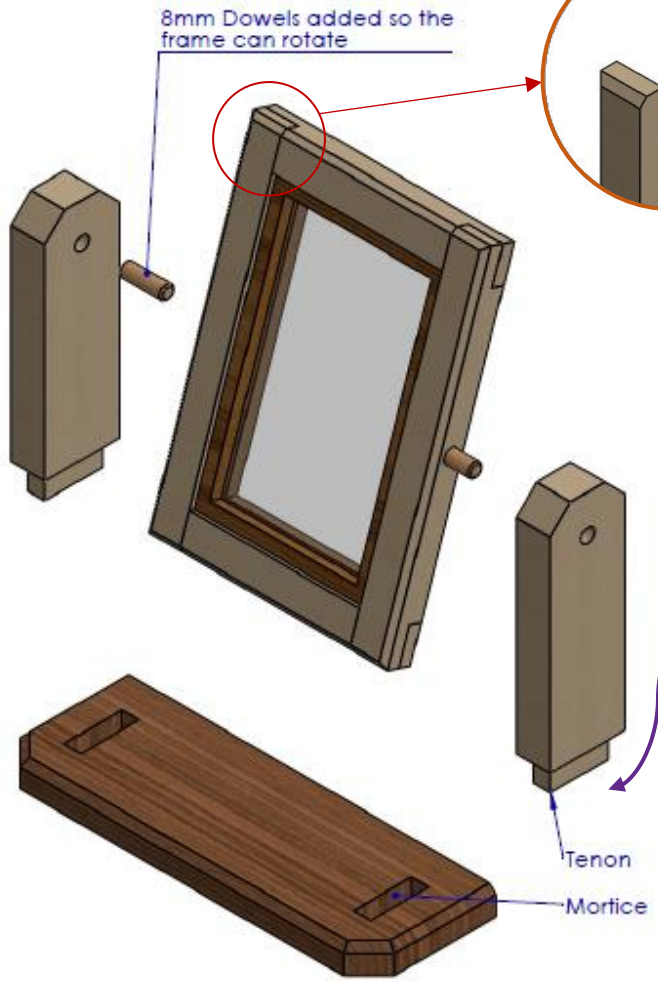
A sub-assembly is when we assemble a collection of parts which are then used together as part of a larger assembly.



In this project, we can make a sub-assembly of the picture frame before assembling it with it's stand.

Dowels: These are small wooden pegs, used in the dowel joint, a quick & strong joint, easily made with just a drill. Used on this project for the pivot point.

The Picture Frame Project:



The Corner Halving Joint:

This is a really useful wood joint for connecting the corners of frames.

It is often called a lap joint because the 2 parts lap over one another.

By cutting this joint we can increase the area for glue to hold the parts together.

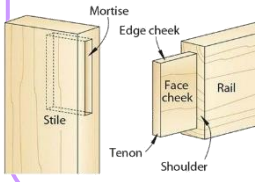
After marking, we need to rip cut down from the end of the workpiece, and cross cut away our waste material at the shoulder. The joint can then be tidied up & made more accurate by paring away any spare waste with a chisel.

The Mortice & Tenon Joint:

This I a great joint for when we need on part of a project to join to & extend from the face of another part, like where the arms to hold the frame join onto the base of our project.

It is made up of a rectangular tongue (the tenon) on the end of one piece which slots into a rectangular hole (the mortice) on the other piece.

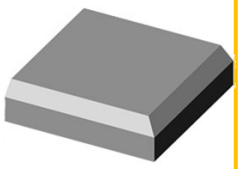
Making this joint accurately takes skill & some patience; sawing the tenon is similar to making the corner halving joint above, but we must cut the shoulder on each side. To make the mortice, we chop out our waste material using a mallet & chisel, digging in from both faces.



To get a good fit, the tenon & mortice must be the exact same size & the shoulder must be level all the way around to sit well on the face of the base.

Key Vocab; "Chamfer":

A chamfer is a small bevel put on the edge of a project part – it removes the sharpness of the edge & adds decoration.



Year 9 DT – Theory Unit Knowledge Organiser

Manufacturing Materials: Plastics;

Plastics are a group of materials called polymers

- **Pros:** They are lightweight, easy to manufacture, durable, colourful & affordable
- **Cons**: They are sourced from crude oil & their production & disposal are harmful to the planet

Thermoplastics; easily softened or melted with heat. Recyclable & good material performance.

Examples = HDPE, Nylon, Polypropylene, Polycarbonate, Polystyrene

Thermosetting Plastics; Can't be remelted with heat. Difficult-impossible to recycle. Often higher performances for specific tasks

Examples = Polyester resin, Epoxy resin, Melamine formaldehyde, Urea formaldehyde, bakelite.

Composite Materials:

Composite materials are materials built of 2+ input materials working together as one. This way we can combine their most useful properties.

GRP; Glass Reinforced plastic – tough, strong, lightweight & affordable. Used in circuit boards

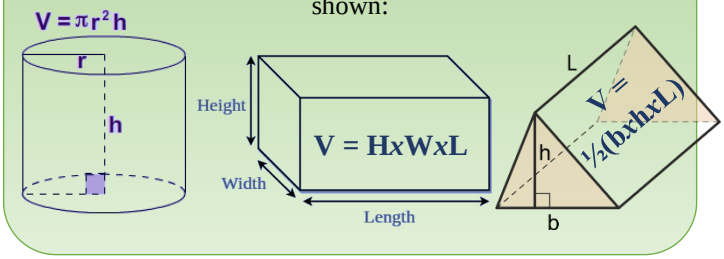
CFRP; Carbon Fibre Reinforced Plastic – excellent strength to weight ratio & tensile Strength

Concrete; Stone, sand & cement – very hard

Plywood; Thin layers of wood laminated together

Maths for DT & Engineering:

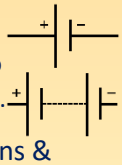
The volume of a shape is how much 3D Space it takes up. Use these formulae to find the volume for the shapes shown:



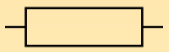
Engineering Elecrtonics:

The below symbols are universally used to show these components in circuit diagrams:

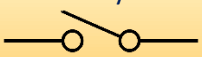
Cell/battery; stores electricity to provide DC current.



Resistor; Controls/ slows the current flow of electrons



SPST Switch; opens & closes the circuit to allow electricity to flow.



L.E.D; A Light Emitting Diode, like a bulb. Very energy efficient.

Product Investigation

Product investigations are a great way to learn ***why materials are chosen for specific jobs*** & explore what other demands impacted on the ***designer's decisions*** & how they ***solved problems*** along the way.

Product Specifications;
What requirements or restrictions might the designer have worked to?

Design Brief; what was the designer's goal/what was their problem to solve?

Common Specifications;

- Aesthetics
- Performance requirements
- Target Audience
- Sustainability
- Cost

Investigating 2 bicycles;

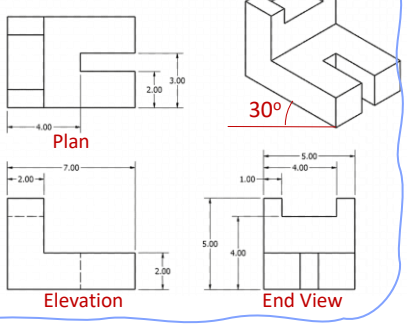
After completing the product investigation, you should be able to explain:

- What a sprocket is
- Why the bicycles differ in design
- Why specific materials were chosen for each
- What design improvements could be made to each

Engineering Drawing:

Orthographic Views show the object from each angle, in 2D. Dimensions are usually attached to these 2D views.

Isometric Projection shows a skewed version of each of these views as we see the object in 3D



Key Vocab for this term:

- Polymer
- Thermoplastic
- Thermosetting plastic
- Composite
- Voltage
- Current
- Ohms
- Isometric
- Orthographic
- Volume
- Material Properties
- Sustainable design
- C.A.D.
- C.A.M.

Knowledge Organiser: Twelfth Night

Writer's Intent
Shakespeare uses as a source of comedy. Shakespeare plays with conventions of gender and moral codes to explore and critique the society he lives in.

Key Characters
Orsino: The Duke of Illyria and its ruler.
Viola/ Cesario: The heroine in the story who disguises herself as her twin brother.
Olivia: A rich countess who is in mourning and uses this to stay off the advances of men.
Sir Toby Belch: Lady Olivia's uncle. He uses Olivia's money to keep himself entertained.
Malvolio: Lady Olivia's steward. He has fantasies that he might marry Olivia and rise above his class.
Feste: Lady Olivia's clown. He is Shakespeare's mouthpiece, criticising other's actions.
Sir Andrew Aguecheek: A knight who is encourage by Sir Toby to court Olivia.
Maria: Lady Olivia's serving woman. She is clever and works with Sir Toby to trick Malvolio.
Sebastian: Viola's twin brother. He is initially mistaken for Cesario which leads to comic mishaps.

Key Idea	Definition
Gender Fluidity	Shakespeare shows how traditional views of gender being fixed can be questioned. He presents a more fluid exploration of gender and the relative powers that come with it that are more in keeping with today's views.
Appearance and Reality	Shakespeare uses characters' reliance on, and faith in, appearance as a source of the majority of the play's misunderstanding that lead to the comic elements.
Love as a Cause of Suffering	Whilst the play ends happily, like any romantic comedy along the way love – or more precisely unrequited love – causes pain. Many of the characters use language that suggests they view love as a curse that attacks its victims suddenly.
Revenge	Revenge brings a darker form of comedy to the play than that of the protagonists. Shakespeare shows how revenge can escalate from actions that at first seem like harmless jest, to ones which are cruel and cause serious mental distress.
The folly of ambition	A reoccurring theme in Shakespeare's plays, it shows how those who overreach their station – and so challenge the natural social order – are doomed to failure. This is one of the ways in which Shakespeare restores, and ensures order.

Key Method	Definition
Shakespearean Comedy	A light-hearted play with a happy ending usually involving marriages between the unmarried characters. Introduction of main character(s), Tragic Event, Journey (physical / self-discovery), Reconciliation, Resolution & Happy Ending
Dramatic Irony	When the full significance of words or actions is clear to the audience but unknown to the character.
Soliloquy	A speech where an actor speaks their thoughts aloud usually when alone.
Symbolism	The use of objects or items to represent other ideas or concepts.

Knowledge Organiser: Twelfth Night

Word	Definition	Word in action
Aside	Lines in a play that are intended to be heard by the audience but unheard by the other characters in the play.	
Characterisation	The building or crafting of a fictional person.	
Disguise	Give (someone or oneself) a different appearance to conceal one's identity.	
Elizabethan	We refer to the time that Elizabeth 1st was on the throne from 1558-1603 as the Elizabethan Era.	
Femininity	Behaviour or qualities regarded as characteristic of a woman.	
Masculinity	Behaviour or qualities regarded as characteristic of a man.	
Motif	A dominant or recurring idea in an artistic work.	
Patriarchal	A system of society or government controlled by men.	
Pun	A joke exploiting the different possible meanings of a word or the fact that there are words which sound alike but have different meanings.	
Sub-plot	A secondary strand of the plot that is a supporting side story.	

Food Preparation & Nutrition

Yr9 Food – Term 2/ Spring

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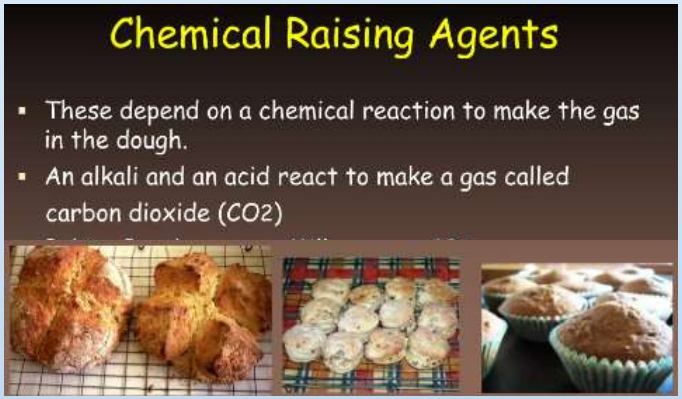
KNOWLEDGE ORGANISER

The science in baking

Rising agents:

Raising agents make bread and cakes rise in the oven so that they have a spongy texture.

Raising agents put a gas (air or CO2) in the mixture. Then, in the oven the heat makes the gas expand and pushes up the mixture. The mixture is able to stretch because of the gluten in the flour. After a while the heat in the oven sets the gluten so that the mixture keeps the risen shape. There are several types of rising agents:



Proteins:

Denaturation->the process of altering a protein's molecular characteristics or properties.

Coagulation-> The process of turning a liquid into a solid. Example: eggs

Carbohydrates:

Gelatinization->When heated a moisture thickens as starch particles absorb water. Example: white sauce.

Caramelization->Sugars change color and flavor when heated. Example: onions.

Dextrinization->Browning that happens when starches are cooked. Example: toast.

Fats:

Plasticity->The ability of fat to hold its shape or melt.

Water:

Evaporation->When water is heated, it turns into a gas.

WHAT HAPPENS WHEN FOOD IS COOKED?

Food Preparation & Nutrition

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Function of carbohydrates in sauces

Sauces are thickened by **gelatinisation**

Sauce Making

Sauces are liquids that are thickened and included in dishes to add moistness, nutritional value, flavor, richness and to improve the appearance of the dish

Sauces can be made using the **blended method** (cornflour is mixed with a liquid and heated) or the **roux method**.
They can be used to as a pouring or coating sauce or to bind other ingredients together

SCAN ME

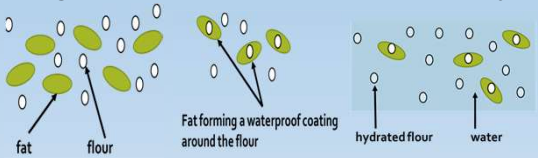
	Proportions of ingredients	Ratio	Outcome
Pouring white sauce	15g plain flour /fat 250g milk	1: 1: 16	Smooth well flavoured sauce, pours freely in thin flow
Coating white sauce	25g plain flour/fat 250ml milk	1: 1: 10	Smooth, well flavoured, thick enough to coat back of a spoon, served with cauliflower, fish, etc
Binding white sauce	50g plain flour/fat 250ml milk	1: 1: 5	Smooth, well flavoured. Very thick to hold other ingredients or bind them together, eg egg white in soufflé, dried ingredients in a meat loaf

Pouring	Coating	Binding / Panada
A **pouring** sauce, at boiling point, should just glaze the back of a wooden spoon, and should flow freely when poured.	A **coating** sauce, at boiling point, should coat the back of a wooden spoon, and should be used as soon as it is ready, to ensure even coating over the food.	A **binding** sauce or **panada** should be thick enough to bind dry ingredients together, so that they can be handled easily to be formed into croquettes, cakes etc



Function of fat in pastry

Fats have a '**shortening**' effect in pastry and biscuits. When fat is rubbed into flour it forms a waterproof coating around the flour particles which reduces the amount of water that can be mixed with the flour. When only a little water is absorbed by flour less gluten is produced and so the mixture is shortened. This shortening effect produces a crumbly, melt-in- the-mouth texture (**plasticity**).



Fats can also be used for aeration, flakiness, retention of moisture and glazing.

Fats can be:
- saturated
- unsaturated
  - Monounsaturated
  - Polyunsaturated

Carbohydrates can be divided into three groups:
- monosaccharides
- disaccharides
- polysaccharides.

Energy

Background:

1. ***Energy is distributed unevenly across the world. Different countries and demographic groups experience different levels of energy security (A)***
2. ***Since industrialisation, the energy mix of countries has been changing over time (B)***
3. ***The use of non-renewables increased rapidly with industrialisation, but there use is declining as populations become aware of the different challenges and opportunities (C)***
4. ***The use of renewables has been increasing in recent years (D)***
5. ***Fracking is the process of releasing gas trapped in shale rock by pumping water and sand into the ground (E)***
6. ***There are different opportunities and challenges presented by developing fracking in Blackpool (F)***

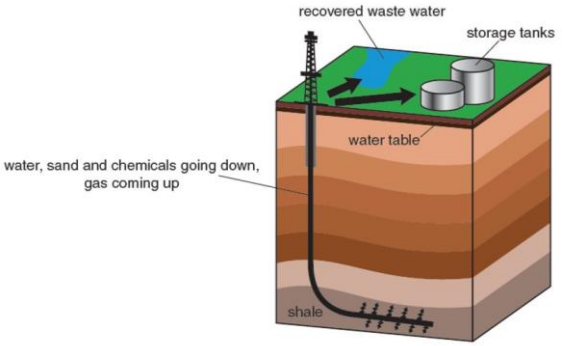
A.	***Energy distribution***
Energy security	To be relatively self-sufficient in energy supply.
Energy poverty	A lack of energy infrastructure and resources.
Renewable energy sources	Energy which is infinite, sustainable and is easily replenished.
Non renewable energy sources	Energy which is finite, not sustainable and takes a long time to replenish.
Social wellbeing	Normally refers to quality of life e.g. happiness
Economic wellbeing	Having present and future financial stability

B.	***The changing***
Energy efficiency	Using less energy to perform the same task.
Climate change	The process of the Earth's climate changing over time
Imports	Goods brought into a country
Energy consumption	The amount of energy used by an individual or group

C.	***Non-renewables***
Coal	A combustible black or dark brown rock formed through the decomposition of organisms over millions of years
Natural gas and oil	Naturally occurring chemicals made from the decomposition of organisms over millions of years.
Decomposition	The state of rotting; decay.

D.	***Renewables***
Infinite	Limitless or endless
NIMBY	Abbreviation for 'not in my backyard'
Wind energy	Turbines use energy from the wind to generate electricity either on land or at sea
Solar energy	Energy from the sun is used to heat water or to generate electricity using photovoltaic cells
Geothermal energy	Underground reservoirs of hot water can be used to heat buildings
Hydroelectric power	Water is trapped by a dam and allowed to fall through turbines. This turns the turbines and generates electricity.
Biomass	Wood, plants or animals burnt for power

E.	***Fracking***
Fracking	The process of releasing gas trapped in shale rock by pumping water and sand in to the ground
Water table	The level below which the ground is saturated with water.



F.	***Blackpool fracking***

OPPORTUNITIES

1. Blackpool council could earn £1.7 million per year through fracking.
2. Energy bills could fall by 2%.
3. The UK could be self-sufficient in energy for years to come.
4. Jobs would be created in an area known for high unemployment.

CHALLENGES

1. Air pollution and noise pollution from the heavy machinery used in fracking.
2. Mini earthquakes could take place.
3. The water which is pumped into the ground could pollute the water supply.
4. Rural areas such as the area around Roseacre Wood could be destroyed.

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Year 9, Topic Summary Sheet

Unit 2: The Holocaust.

Links: Year 11 Germany
GCSE Paper 3 & Paper 2 Cold War

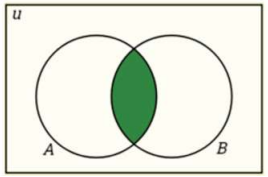
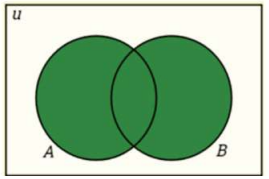
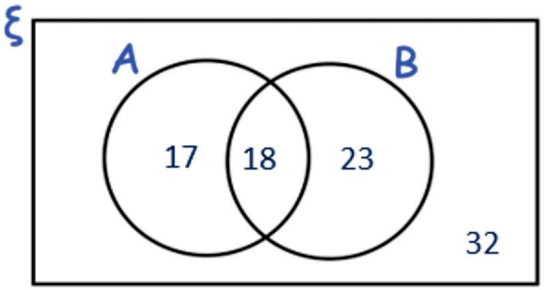
1. Key Dates Timeline	
1.	January 1933 Hitler is made Chancellor of Germany.
2.	April 1933 Jewish shops are boycotted (German citizens are encouraged not to use Jewish shops).
3.	September 1935 The Nuremberg Laws were passes. These were a series of laws reducing German Jews human rights, such as their ability to marry Germans, to vote, and to be recognised as a citizen.
4.	March 1938 Hitler joined Germany with Austria (something that was forbidden by the Treaty of Versailles). This became known as the Anschluss. Remember, Hitler was actually Austrian and not German.
5.	November 1938 Kristallnacht (Night of Broken Glass). This was a pogrom (violent riot) against German Jews carried out by SA (Brown Shirts) forces and civilians throughout Nazi Germany on 9–10 November. The German authorities looked on without intervening. Jewish homes, hospitals and schools were ransacked as the attackers demolished buildings with sledgehammers. The rioters destroyed 267 synagogues throughout Germany, Austria and the Sudetenland. Over 7,000 Jewish businesses were damaged or destroyed and 30,000 Jewish men were arrested and sent to concentration camps.
6.	1st September 1939 Hitler invades Poland. Britain and France issue an ultimatum telling Germany to leave. Germany ignore the threat and Britain and France declare war on Germany on 3rd September 1939.
7.	From October 1939 the process of ghettoization began in Poland in order to confine and segregate Poland's Jewish population of about 3.5 million for the purpose of persecution, terror, and exploitation. The largest ***ghetto*** in Poland was in the capital city of Warsaw, covering the area of 307 hectares (3.07 km^2). The initial population of the ghetto was 450,000.
8.	November 1939 Polish Jews are forced to wear yellow stars. The star represents the Star of David (a Jewish symbol).
9.	From February 1942 the Mass deportation of Western European Jews to concentration camps began. Jewish people were transported from all Nazi occupied countries such as Bulgaria, Romania in the east and France and the Netherlands in the west. They were taken by train to death camps in Poland were they would be systematically murdered.
10.	By 1944 Jews from countries that were Germany's allies were also deported and taken to the gas chambers e.g. Hungarian Jews.
11.	23rd January 1945 Russian troops from the Soviet Union liberated what they thought was a POW (Prisoner of War) camp in Oswiecim, southern Poland that contained 7,000 prisoners. They later realised that this was actually Auschwitz-Birkenau, the world's most notorious crime scene where over 1.2 million Jews, gypsies and other 'untermenschen' (undesirables) had been routinely murdered in gas chambers and their bodies burnt to ashes to hide the evidence.

2. Key Individuals	
12. Adolf Hitler	Nazi Party Dictator of Germany 1933-1945
13. Heinrich Himmler	Leader of the SS. It was the SS that carried out the mass extermination of Jewish people.
14. Adolf Eichmann	Eichmann was a German-Austrian high ranking SS officer and one of the major organizers of the Holocaust
15. Josef Goebbels	Nazi Party minister of propaganda.
16. Rudolf Hoss	Hoss was the longest serving officer in charge of Auschwitz.

3. Key Words/Terms	
17. Lebensraum	Living space in the east (e.g. Poland) where Hitler was planning to build his 1000 year Reich for the master/ superior race (Herenvolk).
18. Minorities	Anyone considered non-Aryan, disabled people, homosexuals, Roma.
19. Nuremberg	A series of laws reducing German Jews human rights, such as their ability to marry Germans, to vote, and to be recognised as a citizen.
20. Pogrom	A violent attack on Jewish communities, these had been occurring all over Eastern Europe & Russia since 1900.
21. Roma	Known as gypsies, they were persecuted especially when the Nazis' moved East during WWII.
22. SA	Known as Hitler's bullyboys in the early days they helped him gain power by intimidating people.
23. SS	Hitler's elite part of the army, also responsible for the workings of the concentration camp network under Himmler.
24. SS Einsatzgruppen	SS murder squads that went around Eastern Europe looking for Jews, capturing them and then murdering them.
25. Sterilisation	Preventing men and women from breeding by an operation.
26. Genocide	The killing of an entire race of people.
27. Synagogue	A Jewish place of worship.

3. Key Words/Terms (Continued)	
28. Anti-Semitism	Discrimination against Jews as a religious group or race.
29. The Final Solution	The Nazi government official policy which authorised the murder of all Jews within the Nazi Reich (empire).
30. Aryan	Meaning pure German blood. Hitler believed they would make Germany great again.
31. Concentration Camps	Prison camps set up by the Nazis in 1933, firstly for political opponents (communists), then minorities from criminals, homosexuals, gypsies, Jews. Some later became extermination camps.
32.Extermination 'death' Camp	A concentration camp designed for the systematic murder of prisoners e.g. Treblinka or Sobibor.
33. Eugenics	The study of races. The Nazis' distorted science such as Darwin's survival of the fittest.
34. Euthanasia	The killing of those with disabilities or diseases.
35. Gestapo	Hitler's spy network, which relied on informants.
36. Holocaust	The Holocaust took place in Europe between 1933 and 1945. Six million Jews were systematically and brutally murdered by the Nazis and their collaborators. Millions of non-Jews, including Roma and Sinti (Gypsies), Serbs, political dissidents, people with disabilities, homosexuals and Jehovah's Witnesses, were also persecuted by the Nazis.
37. Ghettos	Parts of cities reserved for Jews from 1939, they were unhygienic places to live, had a lack of water and healthcare. They acted as prisons as they had large walls and curfews.
38. Kristallnacht	**Kristallnacht** – The Night of broken glass, people encouraged by the SS burned down synagogues, humiliated Jewish people and many were killed.
39. Untermenschen	Anyone considered an undesirable in Hitler's Germany; disabled, Roma, homosexuals and Jews.

KPI 9.12 Probability 1

13) Venn Diagrams	A Venn diagram shows the relationship between groups of different outcomes.	**14) Element**	A list of numbers, objects or outcomes.
15) Universal set	Contains all of the elements for our question	**16) Set Notation**	**A –** all elements in A **A' –** all elements NOT in A **B –** all elements in B **B' –** all elements NOT in B
17) Intersection	**A∩B –** all the elements in both A and B 	**18) Union**	**A∪B –** all the elements in A or B or both 
19) Finding probabilities from a Venn diagram	Venn diagrams can be useful for organising information about frequencies and probabilities. We can then use them to solve conditional probability problems. E.g. The following Venn diagram shows information about the number of members of a local sport club who take part in the Archery and Badminton classes. A person is chosen at random. Find P(B only) $= \frac{18 + 23}{17 + 18 + 23 + 32} = \frac{41}{90}$		

KPI 9.13 Solving Equations 2

1) Solve	Use inverse operations to find the solution of an equation.	**2) Linear equation**	Contains an equals sign (=) and has one unknown. E.g. $5x - 2 = 2x + 7$
3) Equation	An equation is a statement with an equal sign, starting that two expressions are equal in value.		

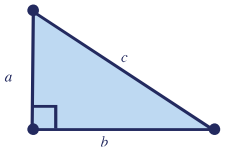
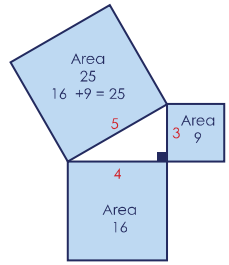
KPI 9.14 Inequalities 1

1) Representing an inequality on a number line– closed circle	A closed circle is used to show greater than or equal to (or less than or equal to) the number. $x \geq 3$ 	**2) Representing an inequality on a number line – open circle**	An open circle is used to show greater than (or less than) the number. $x > 3$ 
3) Reversing the Inequality	Multiplying or dividing both sides by a negative number reverses the inequality	E.g. $-3x < 6$ $x > -2$	

KPI 9.15 Sequences

1) Sequence	A pattern of numbers which fit a certain rule.	**2) Term**	A number in a sequence.
3) Term to term rule	The rule for how to get from one number to the next number in the sequence.	**4) Position**	Where a term is in a sequence.
5) Position to term rule	The rule for how to work out a number in a sequence if you know its position.	**6) Nth term**	Used to find a term in a sequence given its position e.g. 5n + 3
7) Linear sequence	The terms increase or decrease by the same amount each time. Also known as an arithmetic sequence. Nth term is written in the form, an + b.	**9) Geometric sequence**	A geometric sequence goes from one term to the next by always multiplying or dividing by the same value.
10) Fibonacci sequence	The Fibonacci sequence is unique because the next term is found by adding up the two previous terms. 1, 1, 2, 3, 5, 8, 13, 21…		

KPI 9.16 Pythagoras

1) Right-angled triangle	A triangle that contains a right-angle (90 degrees).	**2) Hypotenuse**	The longest side – opposite the right-angle.
3) Pythagoras' Theorem	For any right-angled triangle, the area of the square of the longer length (the hypotenuse) is equal to the area of the squares of the shorter lengths added together.  $c^2 = a^2 + b^2$ $a^2 = c^2 - b^2$ $b^2 = c^2 - a^2$		

Knowledge Organiser| Life and Death

1	**Morality**	Principles concerning the distinction between right and wrong or good and bad behaviour.
2	**Ethics**	Moral principles that govern a person's behaviour or the conducting of an activity.
3	**Sanctity of Life**	The view that all life is sacred because it is made by God.
4	**Quality of Life**	The standard of health, comfort, and happiness experienced by an individual or group.
5	**Rules**	One of a set of explicit or understood regulations or principles governing behaviour.
6	**Natural Moral Law**	A system of laws based on close observation of human nature, given to humans by God.
7	**Precept**	A general rule intended to regulate behaviour or thought.
8	**Reason**	The power of the mind to think, understand, and form judgements logically.
9	**Absolute**	A value or principle which is regarded as universally valid.
10	**Situation Ethics**	The view that there should be flexibility in the application of moral laws according to circumstances.
11	**Relativism**	The view that morality exists in relation to culture, society, or historical context, and is not absolute.
12	**Agape**	Unconditional love, "the highest form of love, charity" and "the love of God for man and of man for God“.
13	**Abortion**	A procedure to end a pregnancy.
14	**Pro-Life**	Opposing abortion and euthanasia.
15	**Pro-Choice**	Advocating the legal right of a woman to choose whether or not she will have an abortion.
16	**Euthanasia**	The painless killing of a patient suffering from an incurable and painful disease or in an irreversible coma.
17	**Capital Punishment**	The legally authorized killing of someone as punishment for a crime.
18	**Animal Rights**	the rights of animals to live free from human exploitation and abuse.
19	**Dominion**	To be in charge of something or rule over it.
20	**Stewardship**	The job of supervising or taking care of something.

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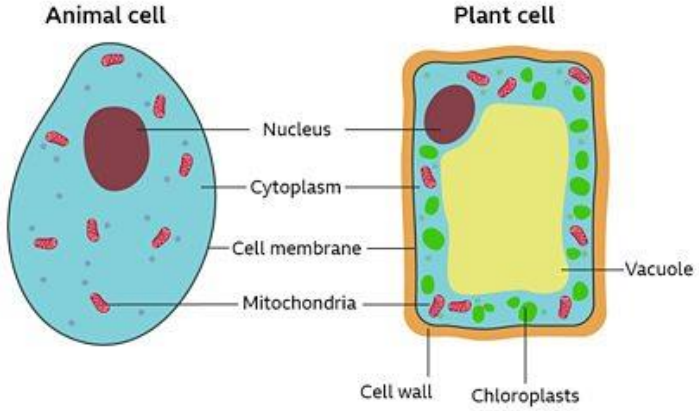
B1 – Cell Biology

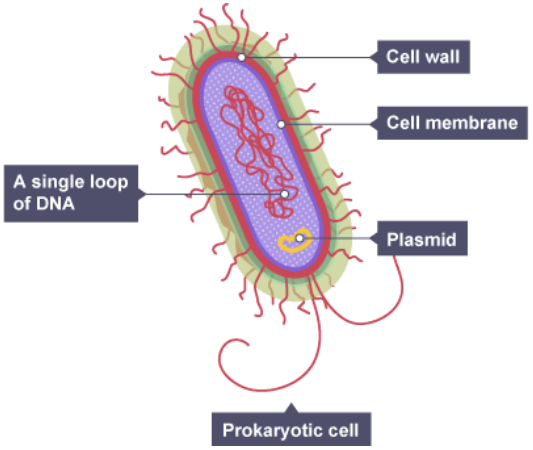
Eukaryotic Cells

They have a nucleus to contain the chromosomes. These can be animal, plant or fungus or protist cells. Animal and plant cells are shown below.



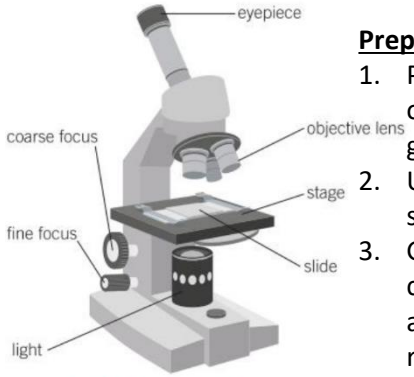
Prokaryotic Cells

They do not have a nucleus, they are usually a lot smaller and may contain plasmids.



Cell		Features
Animal	Sperm	High number of mitochondria Ribosomes that make enzymes in the head
	Nerve	Long Lots of branches (dendrites)
	Muscle	High number of mitochondria High Number of ribosomes Store glycogen
Plant	Xylem	Walls thickened with lignin to strength the cells into a tube
	Phloem	Sections between cells called sieves to help transport substances like dissolved sugars
	Root hair	Large surface area Lack of chloroplasts Large vacuole

RP1 – Microscopy; Observing Plant Cells



Preparing the slide:

1. Place a thin layer of onion membrane on a glass slide with forceps.
2. Use a drop of iodine to stain the cells.
3. Gently place a glass cover slip over the same and tap carefully to remove air bubbles.

Viewing the slide:

1. Place the slide on the stage and turn on the light.
2. Select the lowest magnification objective lens.
3. Look through the eyepiece and turn the coarse focus until the image can be seen.
4. Turn the fine focus until a clear image is formed.
5. Change the objective lens to another with a higher magnification and turn the fine focus re-focus the image.

Microscopes

The development of microscopes of the last 200 years has allowed us to study cells and the structures inside them in more and more detail.

Light Microscope	Electron Microscope
Low resolution Low magnification Cheap	High resolution High magnification Expensive

Calculating Magnification

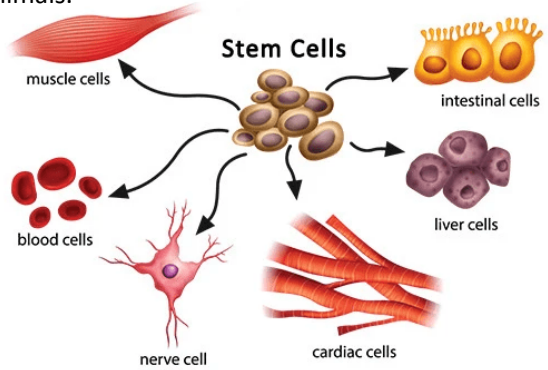
Units for image and actual size may need to be converted before using the equation below.

$$magnification = \frac{image\ size}{actual\ size}$$

mm → µm x 1000
µm → mm ÷1000

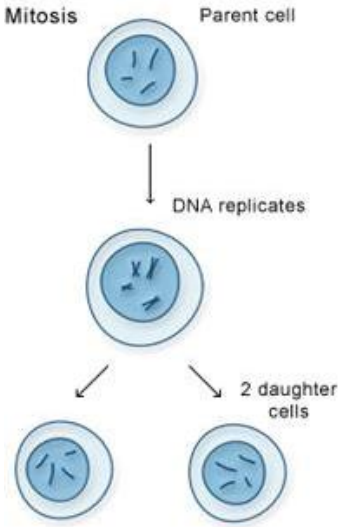
Cell Differentiation

As an organism develops, cells differentiate to form different types of cells. This is an example in animals.



B1 – Cell Biology

Mitosis

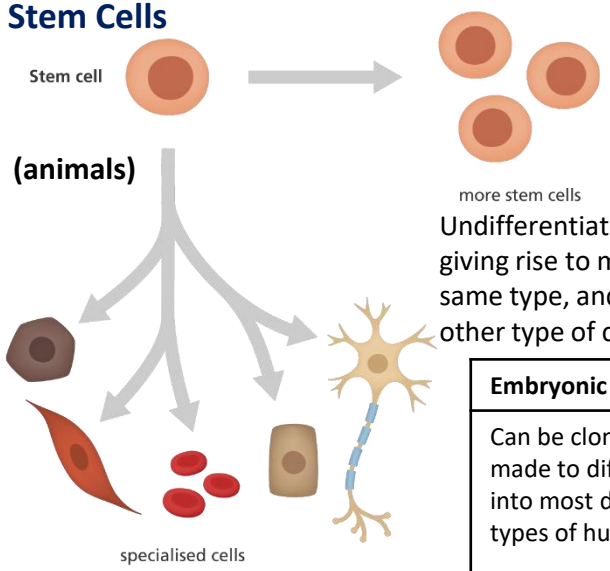


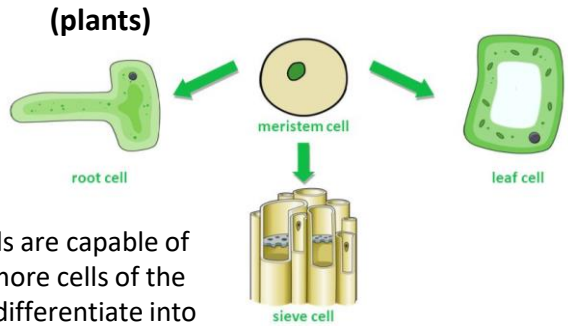
Before a cell can divide it needs to grow and increase the number of sub-cellular structures such as ribosomes and mitochondria. **The DNA replicates** to form two copies of each chromosome.

In mitosis one set of chromosomes is pulled to each end of the cell and the **nucleus divides**.

Finally the **cytoplasm and cell membranes divide** to form <u>two identical cells</u>.

Stem Cells

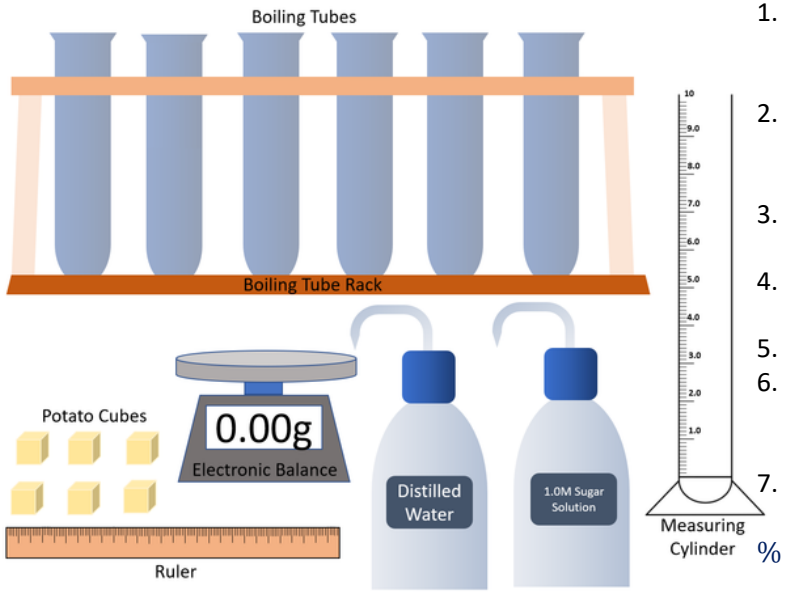




Undifferentiated cells are capable of giving rise to many more cells of the same type, and can differentiate into other type of cells.

Embryonic	Adult	Meristems
Can be cloned and made to differentiate into most different types of human cells	Bone marrow stem cells can form many types of cells including blood cells.	Can differentiate into any type of plant cell, throughout the life of the plant.

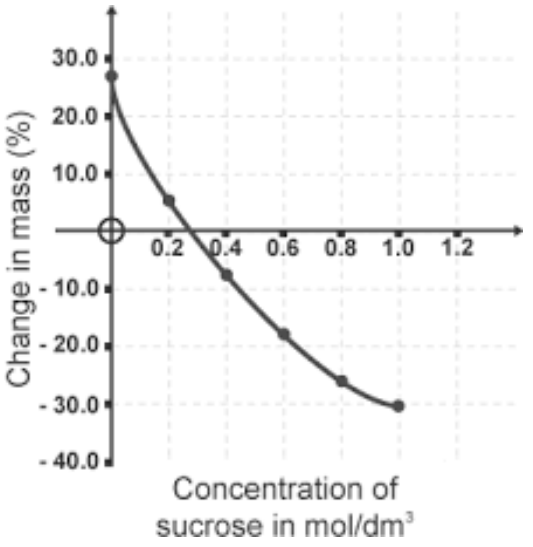
RP2 – Osmosis: The concentration of surrounding solution affects mass of plant tissue



1. Use a cork borer to create 5 cylinders of plant tissue (usually potato) and cut them all to the same length.
2. Measure the mass of each piece using a top pan balance and the length of each piece with a ruler. Record in a table.
3. Measure out 100cm^3 of each concentration of salt/sugar solution into labelled boiling tubes.
4. Place each piece of potato into a boiling tube for 24 hours.
5. Remove the pieces and blot with a paper towel.
6. Measure the mass of each piece using a top pan balance and the length of each piece with a ruler. Record in a table.
7. Calculate the percentage change in mass.

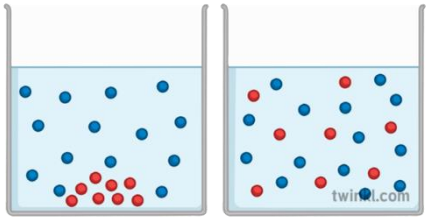
$$\%\ \boldsymbol{change\ in\ mass} = \frac{\boldsymbol{change\ in\ mass\ (g)}}{\boldsymbol{inital\ mass\ of\ potato\ (g)}}$$

<u>Results Graph</u>

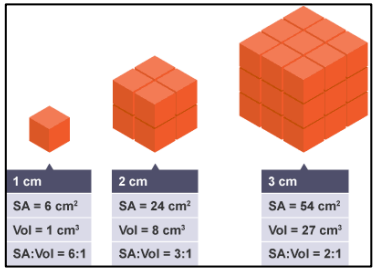


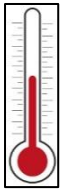
B1 – Cell Biology

Diffusion

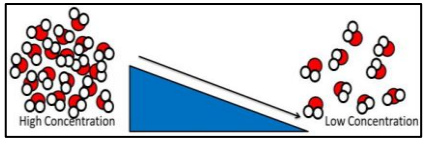


- Substances move a higher concentration of that substance (red particles pictured) to where there is a lower concentration of that substance. (High→ Low)
- This happens because of the random movement of the particles in a fluid (liquid or gas).





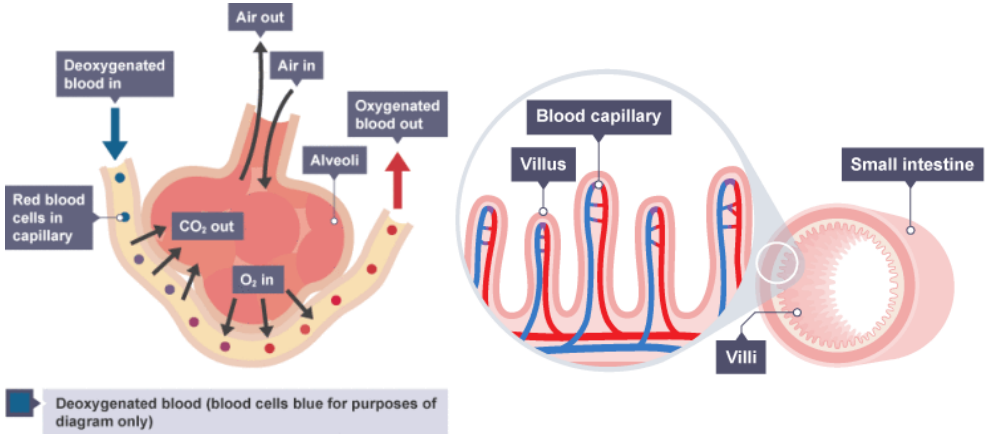
- There are ways the rate of diffusion can be changed:
  - the difference in concentrations (concentration gradient)
  - the temperature
  - the surface area of the membrane



Examples

Alveoli in the lungs and villi in the small intestine are both structured in similar ways so diffusion can happen at a high rate (fast).

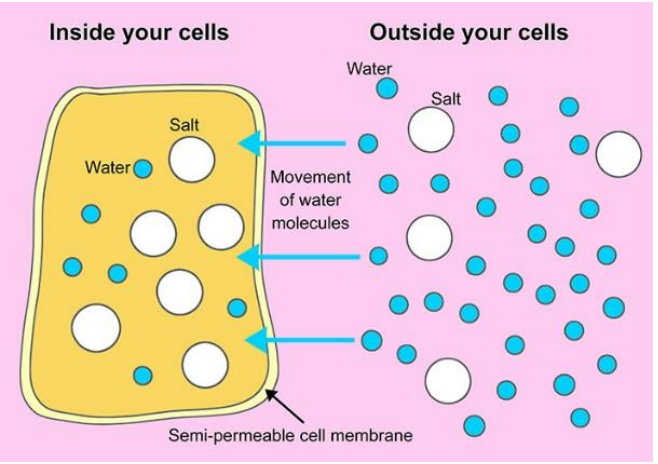
- having a large surface area
- a membrane that is thin, to provide a short diffusion path
- (in animals) having an efficient blood supply



Osmosis

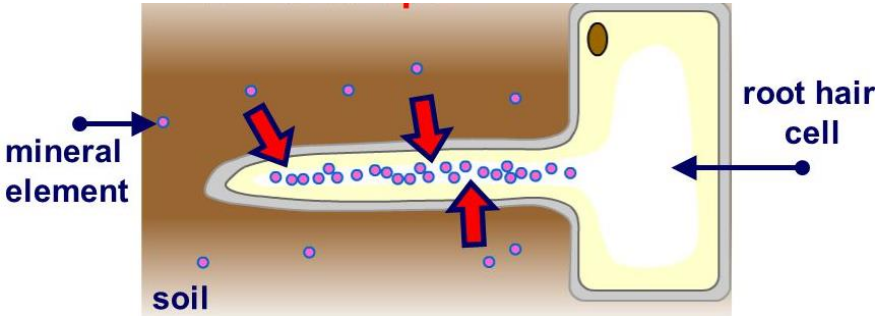
Water may move across cell membranes via osmosis.

Osmosis is the diffusion of water from a dilute solution to a concentrated solution through a partially permeable membrane (H→L).



Partially permeable means small molecules can move through but large molecules cannot.

Active Transport



- Active transport is moving substances against the concentration gradient (L→H) so requires energy. This energy comes from respiration.
- This means that cells that carry out a lot of active transport (root hair cells, epithelial cells on villi in the small intestine) contain a lot of mitochondria.

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Year 9 Spanish Term 4 Knowledge Organiser

¿Cómo es tu zona? // ¿Qué se puede hacer?

¿Te gustaría vivir en un país hispánico?

¿Qué quieres hacer allí?

NOA MFL Department

Soy de Valencia/Buenos Aires/Bogotá – I come from… En mi zona – in my town **En mi pueblo – in my village** **En mi barrio– in my neighbourhood** **hay – there is/are** **No hay – there is/are no**	**Una estación de tren– a train station** **Una piscina– a swimming pool** **Una panadería – a bakery** **Una estación de autobuses– a bus station** **Una biblioteca– a library** **Un ayuntamiento – town hall** **Un aparcamiento– a car park** **Una comisaría – a police station** **Un centro de ocio– a leisure centre.** **Un parque de atracciones– theme park** **Un centro comercial– a shopping centre**	Opinions **es bonito/a– it is pretty.** **es limpio/a – it is clean.** **abarrotado/a– it is busy/crowded.** **es sucio/a – it is dirty.**	Connectives: **También – also** **Además– in addition** **Pero – but** **Sin embargo – however** **Por otro lado– on the other hand** **Hay mucho que hacer** – there is lots to do **No hay nada que hacer** – there is nothing to do	Verb **Se puede– we can** **No se puede– we can't**	Activity **ir al parque de atracciones– go to a theme park** **ir al cine– go to the cinema** **ir a la playa– go to the beach** **jugar en el parque– play in the park** **comer la comida rápida– eat fast food** **ver un espectáculo de teatro - watch a show** **dar un paseo – to go hiking** **ir de compras – to go shopping** **visitar un museo/castilo – visit a museum/castle**

Time expression	Verb	oportunidades de trabajo (job opportunities)	Connectives	Verb	Un nuevo centro comercial – a new shopping centre
Antes – Before **En el pasado –** In the past	**Había –** there was/were (used to be) **Había más –** there was/were more **Había menos -** there was/were less **mi ciudad era** – my town used to be	**oportunidades para los jóvenes** (opportunities for young people) **cosas que hacer** (things to do) **tranquila** (tranquility) **tiendas** (shops) **transporte público** (public transport) **polución** (pollution) **aire puro** (fresh air) **tráfico** (traffic) **verde** (green) **animada** (lively	**pero -** but **Sin embargo –** however **ahora -** now	**Hay –** there is **No hay –** there is no **Es más/menos –** it is more/less	**oportunidades de trabajo** (job opportunities) **cosas que hacer** (things to do) **tranquila** (tranquility) **tiendas** (shops) **transporte público** (public transport) **polución** (pollution) **aire puro** (fresh air) **tráfico** (traffic) **verde** (green) **animada** (lively **más casas** – more houses

	hace mucho sol en verano en el sur de España (it is warm in summer in the south of Spain)	**mientras que llueve todo el tiempo en verano en mi región** (whereas it rains a lot in my town in summer)	
Creo que – I think that **Desde mi punto de vista –** from my point of view	**el paisaje es más espectacular en los Pirineos** (the scenery is more spectacular in the Pyrenees)	**en comparación con mi pueblo donde no hay montañas** (in comparison to my small town where there are no mountains)	
A mi modo de ver – in my opinion	**Madrid tiene más atracciones para los turistas** (Madrid has more tourist attractions)	**en comparación con mi región, dónde no hay nada que hacer** (in comparison to my area, where there is nothing to do)	**¡Qué pena!** - it's a shame
Según yo – according to me **Que yo sepa–** as far I know	**en comparación con Madrid mi ciudad no es cultural porque** (in comparison to Madrid, my town isn't very cultural because)	**no hay museos.** (there are no museums)	
	Hay desiertos y playas tropicales en México (there are tropical plants in Mexico)	**mientras que mi región indudablemente no es tropical** (whereas the wildlife and flowers are not tropical in my area)	

Si tuviera la oportunidad If I had the opportunity **Cuando sea mayor** When I am older **Si pudiera** If I could **Viviría en** I would live in... **Prefería vivir en** I would prefer to live in **Me gustaría vivir en** I would like to live in	**un país hispánico** **el extranjero** (abroad) **Costa Rica** **en un parte de México** (somewhere in Mexico) **la República Dominicana** **Colombia**	**ya que** – because	**me mola el clima** (the weather appeals to me) **disfruto el estilo de vida**(I enjoy the way of life) **Soy fan de la comida típica!** (am a fan of the food) **me encanta los deporte acuáticos** (I love water sports) **las personas son amables** (the people are nice) **la cultura Sudamericana me interesa** (the south american culture interests me)	**Además**– moreover **quiero** – I want **espero** – I hope **tengo ganas de**– I have the desire to	**probar la comida típica** (to try traditional food) **ver los sitios históricos, como Machu Pichu** (see historical sites) **descubrir la jungla** (discover the jungle) **hacer un tour en el desierto** (do a tour of the desert) **ver la montañas** (see the mountains) **descubrir los festivales** (discover traditional festivals) **tener clases de salsa** (have salsa lessons)

Notes

Notes

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