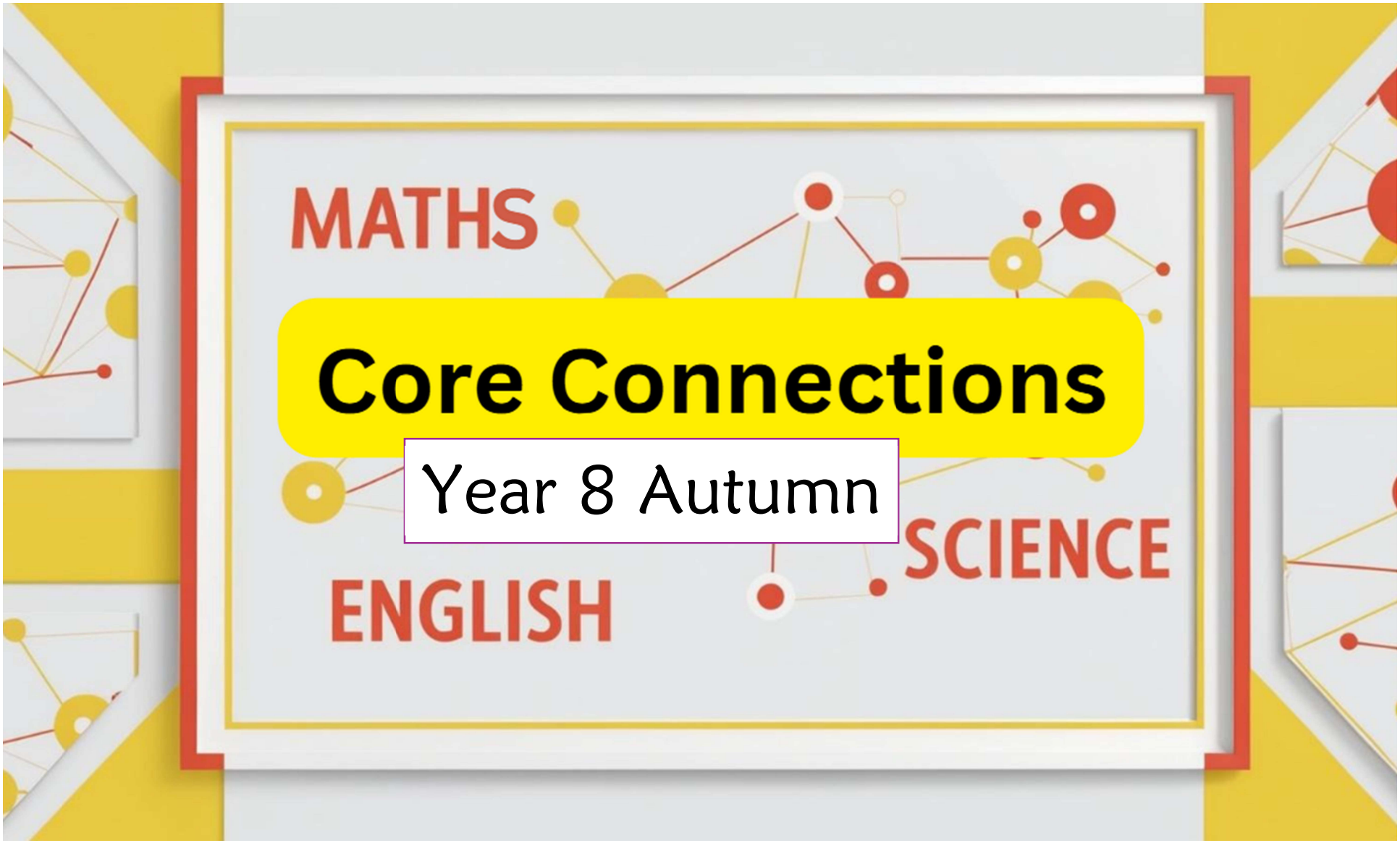

MATHS
Core Connections
Year 8 Autumn
SCIENCE
ENGLISH

Core Connections @ Southam College

The following sheets provide a broad overview of the topic(s)s studied in Year 8 this term.

They are not intended as additional work but as a resource to look up key concepts when going over lesson content before or after your lessons or when completing home learning.

There are also links to online resources if you would like further explanations or examples.

We hope you find them useful and will ask you at the end of the half-term for some feedback.

English

Maths

Science (Biology / Chemistry / Physics)

English

Core Connections Year 8 Autumn

Henry V and Speech Writing

What is Henry V about?

Henry V is a play by William Shakespeare. It tells the story of King Henry V of England, a young king who leads his army into battle against France.

The most famous moment in the play is when Henry gives a motivational speech to inspire his soldiers before they fight at the Battle of Agincourt. He encourages them to fight bravely, stay united, and believe in themselves even though they are outnumbered.

Although the play is from the 1600s, the speech still feels powerful today because of the way Henry uses persuasive techniques- many of which we still use in modern speeches.

DAFOREST

Persuasive Language Techniques

These are common techniques used in persuasive writing and speech including in Henry V.

Technique	**What it Means**	**Modern Speech Example (Like Henry V)**
D – Direct Address	Speaking directly to the audience	"You have trained for this. You are ready."
A – Alliteration	Repeating the same sound at the start of words	"Brave, bold, and battle-ready."
F – Facts	True information to support your point	"This is our tenth successful mission together."
O – Opinion	A strong belief or personal view	"I believe in every single one of you."
R – Rhetorical Question	A question that doesn't need an answer	"Are we really going to walk away now?"
E – Emotive Language	Words that create strong emotions	"They tried to break us. They failed."
S – Statistics	Using numbers or data	"90% of our missions have ended in victory."
T – Triplet (Rule of Three)	A list of three ideas for impact	"We fight with courage, honour, and heart."

Use this sheet to remind yourself how persuasive speeches work in real life and in literature.
Henry V's speech shows how powerful language can be when used to inspire, unite, and lead.

Top Tips for writing a persuasive speech

1. Know Your Audience

Think about who you are speaking to. What do they care about? What arguments will convince them?

Example: If you are speaking to students, explain how your idea affects their daily lives.

2. Start with a Strong Opening

Grab your audience's attention straight away.

Try:

- A surprising fact
- A rhetorical question
- A bold statement

Example: *"Would you be happy to spend six hours a day staring at a screen?"*

3. Make Your Opinion Clear

Your audience should never be confused about your viewpoint.

Example: *"I strongly believe that school uniforms should be abolished."*

4. Use the Rule of Three

Groups of three ideas are memorable and powerful.

Example: *"They are expensive, uncomfortable and unnecessary."*

5. Include Rhetorical Questions

These make your audience think and engage with your argument.

Example: *"How can we expect students to learn when they are exhausted?"*

6. Use Emotive Language

Choose words that create strong feelings.

Instead of: *bad* Try: *harmful, unfair, damaging, devastating*

7. Support Your Points

Give reasons, examples, facts or evidence to strengthen your argument.

Example: *"Research shows that students who get enough sleep perform better in lessons."*

8. Address the Other Side

Show that you understand opposing views before explaining why your argument is stronger.

Example: *"Some people argue that homework improves learning. However, too much homework can increase stress and reduce free time."*

9. Repeat Key Ideas

Repetition helps your audience remember your message.

Example: *"We need change. We deserve change. We must demand change."*

10. Finish with a Powerful Conclusion

End by summarising your main point and encouraging action.

Example: *"Together, we can make a difference. The choice is yours."*

Maths

Year 8 Maths: Core Connections

Listed in the left hand column in the tables below are the topics that you will be covering in the Autumn term in your Maths lessons.

To enable you to keep up while you are not in school there are links to SPARX tasks in the right hand column.

Use the independent learning section within SPARX to try the tasks and remember that if you struggle there are videos to guide you!

Ratio and scale	
Topic	Sparx
Understanding the meaning and representation of ratio	
Understand and use ratio notation	M885 Writing and simplifying ratio
Solve problems in the form 1 : n (or n : 1)	M543 Writing ratios in the form 1 : n
Solve proportional problems involving the ratio m : n	M801 Using equivalent ratios to find unknown amounts
Divide a value into a given ratio	M525 Sharing amounts in a given ratio
Express ratios in their simplest integer form	M885 Writing and simplifying ratio
H Express ratios in the form 1 : n	**M543 Writing ratios in the form 1 : n**
Compare ratios and related fractions	M267 Converting between ratios, fractions and percentages
H Understand π as the ratio between diameter and circumference	**M169 Finding the circumference of circles**
Understand gradient of a line as a ratio	

Multiplicative change	
Topic	Sparx
Solving problems involving direct proportion	M478 Solving proportion problems M681 Value for money
Explore conversion graphs	M843 Plotting real-life straight line graphs M771 Interpreting real-life straight line graphs
Convert between currencies	U610 Currency conversion
H Explore direct proportion graphs	**M448 Graphs of direct and inverse proportion**
Explore relationships between similar shapes	M377 Understanding similarity
Understand scale factors as multiplicative representations	M324 Finding unknown sides in similar shapes U519 Finding unknown sides in similar shapes
Draw and interpret scale diagrams	M112 Drawing and interpreting scale diagrams
Interpret maps using scale factors and ratios	M112 Drawing and interpreting scale diagrams

Multiplying & Dividing fractions	
Topic	Sparx
Represent multiplication of fractions	M157 Multiplying fractions
Multiply a fraction by an integer	M695 Finding fractions of amounts without a calculator
Find the product of a pair of unit fractions	
Find the product of a pair of any fractions	M684 Finding fractions of amounts with a calculator
Divide an integer by a fraction	M110 Dividing fractions
Divide a fraction by a unit fraction	
Understand and use reciprocal	
Divide any pair of fractions	M110 Dividing fractions

Working in the Cartesian plane	
Topic	Sparx
Work with coordinates in all four quadrants	M618 Reading and plotting coordinates
Identify and draw lines that are parallel to the axes	M797 Plotting horizontal and vertical lines
Recognise and use the line y = x	M932 Plotting straight line graphs M544 Finding equations of straight line graphs
Recognise and use lines of the form y = kx	
Link y = kx to direct proportion problems	
H Explore the gradient of the line **y = kx**	**M448 Graphs of direct and inverse proportion**
Recognise and use lines of the form y = x + a	M888 Interpreting equations of straight line graphs
Explore graphs with negative gradients (y = -kx, y = a – x, x + y = a)	M544 Finding equations of straight line graphs

Representing data	
Topic	Sparx
Draw and interpret scatter graphs	M769 Plotting scatter graphs
Understand and describe linear correlation	M596 Interpreting scatter graphs
Draw and use line of best fit (1) & (2)	
Identify non-linear relationships	
Identify different types of data	U322 Types of data
Read and interpret ungrouped frequency tables	M945 Collecting and recording data using tables
Read and interpret grouped frequency tables	
Represent grouped discrete data	
Represent continuous data grouped into equal classes	
Represent data in two-way tables	M899 Interpreting frequency tables

Tables and probability	
Topic	Sparx
Construct sample spaces for 1 or more events	M718 Sample space diagrams
Finding probabilities from a sample space	
Find probabilities from two-way tables	M899 Interpreting frequency tables
Find probabilities from Venn diagrams	M829 Venn diagrams M419 Probabilities from Venn diagrams M834 Venn diagrams with set notation
H Use the product rule for finding the total number of possible outcomes	**U369 Using the product rule for counting**

Science

Biology Core Connections

B1 Health and Lifestyle

Lesson 1: Nutrients

Key points

- A healthy diet contains carbohydrates, proteins, fats, fibre, water, vitamins and minerals.

You need to know the 7 types of nutrients, their functions in the body and the foods that you would find them in.



Lesson 2: Food tests

Key points

- There are four food tests
- We can test for sugar, starch, protein and fat

You need to know the four food tests, the chemicals that you use and what you can see with a positive test. Remember that the Glucose test requires that you heat the reagent Benedict's with the food sample



Lesson 3 Unhealthy diet

Key points

- Malnutrition is a serious health problem. It happens when people do not eat the right amounts of nutrients.
- Too little food, or a lack of nutrients, can cause deficiency diseases or death.
- Too much food results in obesity. This may cause heart disease or type 2 diabetes

You need to know the causes and effects of deficiency diseases, including rickets, scurvy and night blindness.

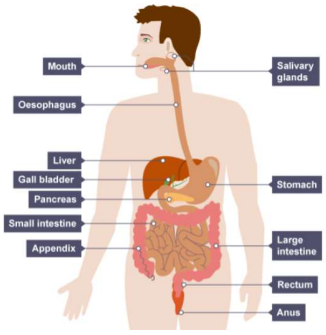


Lesson 4: Digestive system

Key points

- The digestive system breaks down food into tiny particles which are absorbed into the blood.
- These particles provide energy for the body to grow, repair itself and remain healthy.
- Food that cannot be broken down is released from the body as faeces (poo).

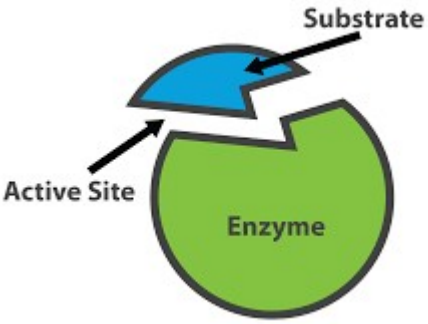
You need to know the parts of the digestive system and what they do



Lesson 5: Bacteria and enzymes in digestion

Key points

- The human body digests carbohydrates, proteins and fats.
- These carbohydrates, proteins and fats are digested into nutrients and absorbed into the body.
- Enzymes are biological catalysts which speed up reactions including digestion.



You need to know that enzymes speed up the breakdown of food and are found in the digestive system.

Lesson 6: Drugs

Key points

- Recreational drugs have serious effects on behaviour and health.
- Some recreational drugs are illegal and others are legal.



You need to know the difference between medicinal and recreational drugs as well as the meanings of the terms addiction and withdrawal symptoms.

Lesson 7: Alcohol

Key points

- Many adults' drink alcohol but it can be harmful. Drinking even small amounts of alcohol can change your behaviour and effect health.

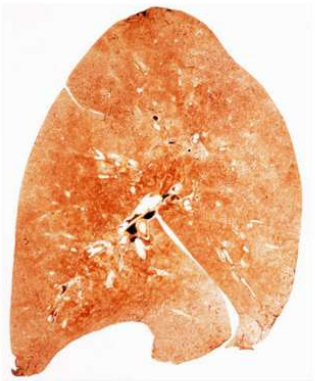
You need to know what alcohol is, how it is measured in units and the dangerous effects of alcohol on the body.



Lesson 8: Smoking

Key points

- Most people know that smoking harms your health, yet many people still smoke. Even breathing in the smoke of someone else's cigarette can affect your health.



A section through a normal lung



A section through a smoker's lungs, blackened by tar

You need to know the effects of tobacco smoke on health.

Want to go a little deeper? Use the QR codes to find out more about each lesson.

Chemistry Core Connections

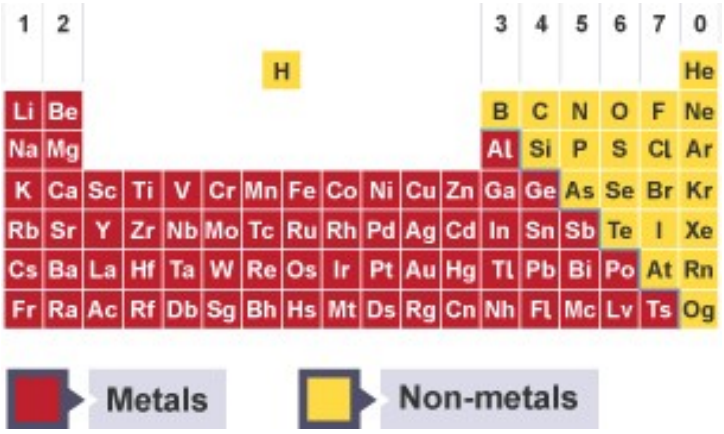
C1 Periodic Table & Separation Techniques

Lesson 1: Metals and Non-Metals

You need to know the properties of metals:

- strong and hard
- high melting points
- high density
- malleable (can be hammered into shape)
- ductile (can be drawn into wires)
- good conductors of heat and electricity

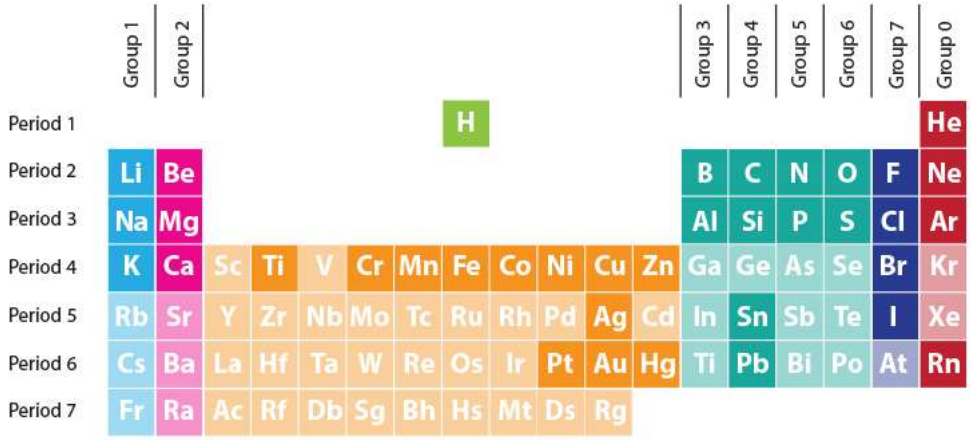
You need to know where metals and non-metals are located in the periodic table



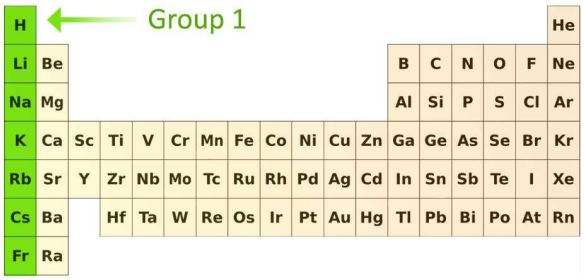
Lesson 2: Groups and Periods

You need to know that a **group** in the periodic table is a vertical column.
You need to know that a **period** in the periodic table is a horizontal row.

You need to be able to work out which group or period an element is in using the periodic table.



Lesson 3: Group 1 – Alkali Metals



You need to know the physical properties of the alkali metals.

- soft
- low melting point
- low density (float on water)



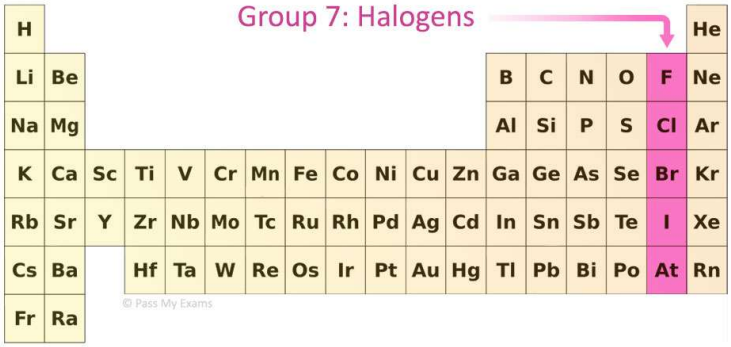
You need to know that the reactivity of the alkali metals increases as you go down the group.
You need be able to describe the reaction between the alkali metals and water.

Alkali Metal	**Description of Reaction with Water**
Lithium	fizzes, floats, moves on the surface of the water, dissolves
Sodium	fizzes, floats, moves on the surface of the water, dissolves, melts into a ball
Potassium	fizzes, floats, moves on the surface of the water, dissolves, melts into a ball, burns with a lilac flame

You need to know the word equation between an alkali metal and water;

Sodium + Water → Sodium Hydroxide + Hydrogen

Lesson 4: Group 7 – The Halogens



You need to know the colours and states of the halogens

Halogen	**Colour**	**State at room temperature**
Fluorine	colourless	gas
Chlorine	pale green	gas
Bromine	orange	liquid
Iodine	grey	solid



You need to know the trends down group 7

- Boiling point increase
- Colour gets darker
- Reactivity decreases

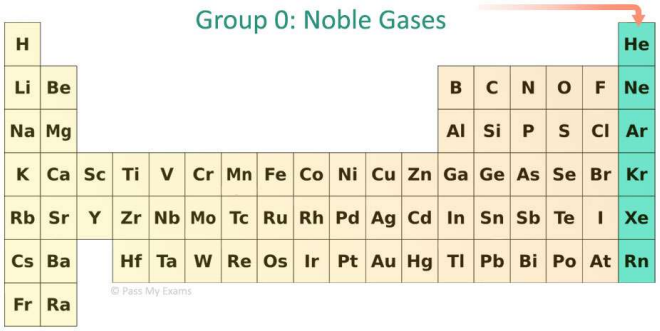
Lesson 5: Group 7 – Halogen Displacement

You need to know that a **displacement reaction** is when a more reactive element takes the place of a less reactive element in a compound.

The table below shows the results of a displacement reaction between a solution of halogen and a halide compound.

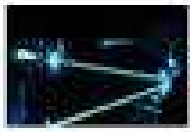
Start With: / Add	Potassium Chloride KCl – Colourless	Potassium Bromide KBr – Colourless	Potassium Iodide KI – Colourless
Chlorine Water Cl_2 – Colourless	no reaction	orange solution (Br_2) Cl has displaced Br	brown solution (I_2) Cl has displaced I
Bromine Water Br_2 – Orange	no reaction	no reaction	brown solution (I_2) Br has displaced I
Iodine Water I_2 – Brown	no reaction	no reaction	no reaction

Lesson 6: Group 0 – The Noble Gases



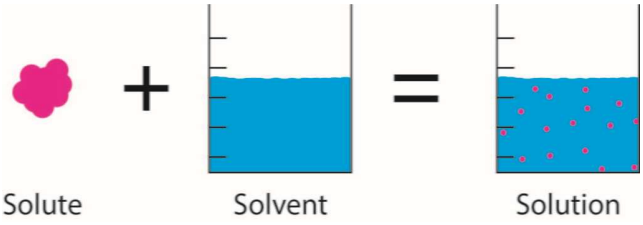
The noble gases are unreactive.
Trends down Group 0:

- Boiling point increase
- Density increases

Noble gases					
Helium	Neon	Argon	Krypton	Xenon	Radon
					
Helium is the 2nd most abundant element in the universe	Neon is most commonly used in signs	Argon is a common gas used in lasers	Krypton emits a bright white light when a strong electric current is passed through it	Xenon ion drive engines propel spacecraft on deep space missions	Radon is a radioactive highly toxic gas

Lesson 8: Solutions

You need to know that a **solution** is made when a substance *dissolves* into a liquid. A solution can also be called a mixture.



The liquid is called the **solvent**. The substance that has been dissolved is called the **solute**.

Lesson 9: Solubility

You need to know that solubility of a solid in a liquid increases with temperature.

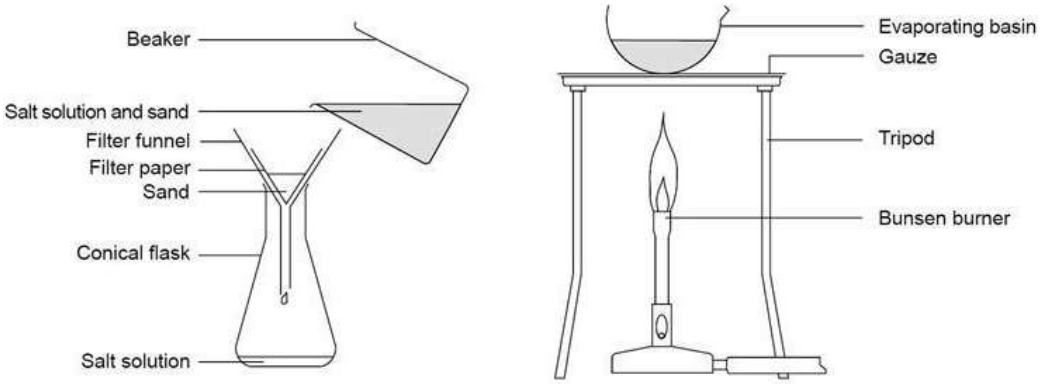
A **saturated** solution is a solution with the maximum amount of a solid dissolved in a liquid.

Lesson 10: Filtration and Evaporation

You need to know that **filtration** is used to separate an undissolved solid from a liquid.

You need to know that **evaporation** is used to separate a dissolved solid from a solution.

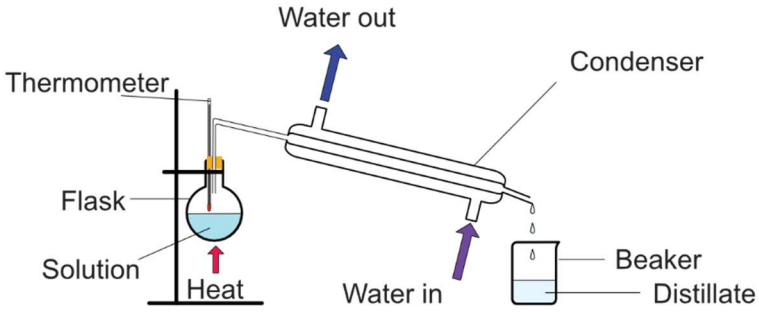
Filtration **Evaporation**



Lesson 11: Distillation

You need to know that **distillation** is used to separate mixtures of liquids.

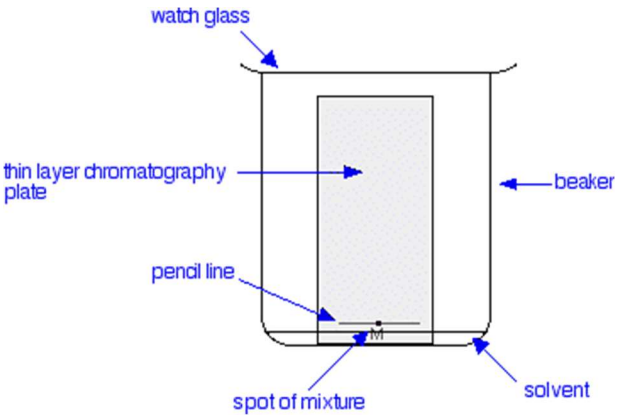
The diagram shows a distillation diagram. The solution is heated up and boils. The vapour rises, goes through the condenser, turns to a liquid and is collected in a beaker.



Lesson 12: Chromatography

Chromatography is used to separate coloured mixtures like inks or dyes. Method:

1. Draw a pencil line at the bottom of filter paper.
2. Place a small spot of ink in the pencil line.
3. Place the paper in a beaker of water. Make sure the water starts below the pencil line.
4. Wait for the water to travel up the paper.


watch glass
thin layer chromatography plate
beaker
pencil line
M
spot of mixture
solvent

Year 8 Physics – Forces Unit Summary

Lesson 1: Introduction to Forces

- **What is a Force?** A push or pull acting on an object.
- **Types of Forces**: Contact (e.g. friction, air resistance) and non-contact (e.g. gravity, magnetism).
- **Measuring Forces**: Using a Newton meter; unit is the **newton (N)**.
- **Effects of Forces**: Can change an object's speed, direction, or shape.

Lesson 2: Friction

- **Definition**: A force that opposes motion between two surfaces in contact.
- **Examples**: Walking, brakes on a bike, rubbing hands together.
- **Useful vs. Unwanted Friction**: Grip vs. wear and energy loss.
- **Reducing Friction**: Lubrication, smooth surfaces.

NB: The QR covers lessons 2 and 3 (just scroll down!)

Lesson 3: Drag

- **Definition**: A type of friction that acts on objects moving through fluids (air or water).
- **Air Resistance**: A form of drag in air.
- **Streamlining**: Reducing drag by changing shape (e.g. cars, planes, fish).
- **Factors Affecting Drag**: Speed, shape, surface area, and fluid type.

Lesson 4: Balanced and Unbalanced Forces

- **Balanced Forces**: No change in motion – object stays still or moves at constant speed.
- **Unbalanced Forces**: Cause acceleration, deceleration, or change in direction.
- **Resultant Force**: The overall force acting on an object.
- **Examples**: Tug of war, falling objects, pushing a trolley.

Lesson 5 & 6: Hooke's Law

- **Hooke's Law**: The extension of a spring is proportional to the force applied (within the elastic limit).

- **Formula**:
  F=k×e*F=k×e*
  force, *k* is spring constant, and *e* is extension.
- **Practical Investigation**: Measuring how springs stretch under different weights.
- **Elastic vs. Plastic Deformation**: Temporary vs. permanent change in shape.

Lesson 7: Weight and Mass

- **Mass**: The amount of matter in an object (measured in kilograms, kg).
- **Weight**: The force of gravity acting on mass (measured in newtons, N).
- **Formula**:
  Weight=Mass×Gravitational Field StrengthWeight=Mass×Gravitational Field Strength
  (On Earth, g ≈ 9.8 N/kg)
- **Key Difference**: Mass stays the same everywhere; weight changes with gravity.

Year 8 Physics – Motion Unit Summary

Lesson 1 & 2: Speed

- **Definition of Speed**: How fast an object moves.
- **Formula**:
  Speed=Distance / Time
- **Units**: Metres per second (m/s), kilometres per hour (km/h).
- **Measuring Speed**: Using stopwatches to measure time and measuring tapes to measure distance we can calculate speed in practical activities.
- **Factors Affecting Speed**: friction, air resistance
- **Real-Life Examples**: Comparing walking, cycling, and car speeds: find out how fast each of these travel and remember them so you can make estimates

Lesson 3: Motion Graphs (Distance-Time Graphs)

- **Understanding Graphs**: What the shape of a graph tells us about motion.
- **Key Features**:
  - Straight diagonal line: constant speed.
  - Curved line: changing speed.
  - Flat horizontal line: stationary object.
- **Interpreting Graphs**: Describing motion from graph shapes.

Lesson 4: Finding Speed on a Distance-Time Graph

- **Using Graphs to Calculate Speed**:
    - Identify distance and time from the graph.
    - Apply the speed formula to sections of the graph.
- **Gradient of the Line**: Steeper gradient = faster speed.
- **Comparing Speeds**: Using different sections of the graph to compare motion.

Lesson 5: Plotting a Velocity-Time Graph

- **Difference Between Speed and Velocity**: Velocity includes direction.
- **Velocity-Time Graphs**:
    - Horizontal line: constant velocity.
    - Sloped line: acceleration or deceleration.
- **Plotting Data**: Using given velocity and time values to create graphs.
- **Interpreting Graphs**: Understanding acceleration, deceleration, and constant motion.