KS3 Science Department

Year 8 Cycle 2

This Knowledge Organiser contains information to help you succeed in Cycle 2! Learning consultants will set some of the tasks to complete as independent learning. You should also attempt some as part of your revision. The more tasks you complete, the more progress you will make this Cycle.

Reduce it

- Reduce the key information for this topic into 20 words or less!
- Sum up each page in 5 bullet points.
- Answer each learning question in 10 words.

Transform it

- Transform the key word definitions into a set of pictures.
- Transform each learning question into a picture.
- Transform each learning question into a poem.

Prioritise it

- Prioritise 5 points from the topic. Arrange them from most to least important. Can you explain your choice?
- Which learning question is most important? Why?

Practice it

- Write your own exam questions (with answers) on the topic.
- Make flashcards for the keywords. Test yourself on the definitions!

Tricky Test Terminology

Identify, state or name—this is a simple instruction to just write the correct term or name.

Define—what does the word mean?

Describe—give some extra detail. Let the number of marks guide you on how much to write.

Outline—describe the theory or process.

Connect it

- Choose 4 keywords from the topic. How do they link? Connect them with lines to explain the links.
- How does the topic link to other areas of science?

Extend it

- Write down 3 key words for this learning question. Why are they important?
- Answer he learning question as fully as you can.

Create it

- Create a mind-map about the topic or learning question.
- Create a short test for this topic. Produce an answer booklet to match.

Useful websites;

Kerboodle.com (username: school username, password: school username, institution code: gra9)

https://www.bbc.com/bitesize/guides/z9pv34j/revision/1 (BBC Bitesize Biology)

https://www.bbc.com/bitesize/guides/zgvc4wx/revision/1

(BBC Bitesize Chemistry)

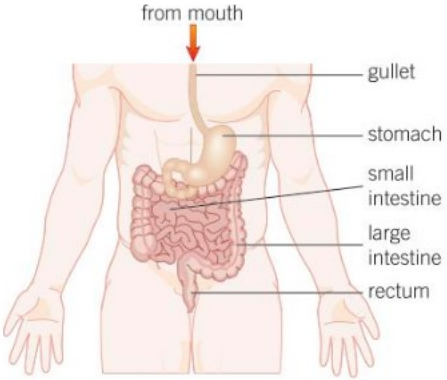
https://www.bbc.com/bitesize/guides/z3g8d2p/revision/4

(BBC Bitesize Physics)

Cycle 2 Biology

Word Bank

Nutrients	Substances your body needs to survive.
Digestion	The process of turning food into useful substances
Enzyme	Biological catalyst.
Catalyst	Speeds up a reaction but isn't used up.
Bacteria	Found in the large intestine. They break down food.



How can we test for different food groups?

⇒ To test for starch, use iodine solution. If the solution turns from orange/brown to blue/black it contains starch.

⇒ To test for lipids, add ethanol and shake well. If the solution is cloudy the food contains lipids.

⇒ To test for sugar, add Benedict's solution and heat. If the solution goes from blue to red/orange, the food contains sugar.

⇒ To test for protein, add copper sulfate and then sodium hydroxide. If it turns purple, it contains protein!

How does the digestive system perform its function?

⇒ Food is chewed and mixed with saliva. Teeth break into smaller chunks.

⇒ Food passes down the gullet.

⇒ In the stomach food is mixed with acid and digestive juices.

⇒ In the small intestine, more digestive juices from the liver and pancreas are added. Small molecules of nutrients pass through the intestine wall into the blood stream.

⇒ Food that cannot be digested passes into the large intestine. Here, any water passes back into the body.

⇒ The remaining waste is faeces, this is stored in the rectum until it is passed out of the anus.

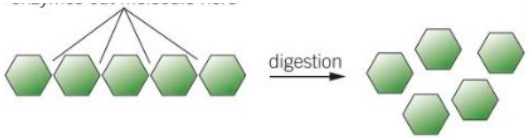
What are the consequences of an unhealthy diet? You can be underweight if you don't consume enough calories. Underweight people are often tired, lack energy, have poor immune systems and vitamin deficiencies . If you consume too much you may become overweight. Overweight people are more at risk of heart disease, stroke, diabetes or cancer. Vitamin A deficiency causes night blindness. Vitamin D deficiency causes rickets (weak bones).

What are the components of a balanced diet?

A balanced diet contains the right nutrients in the correct amounts.

1. Carbohydrates provide energy.
2. Lipids provide energy.
3. Proteins are used for growth and repair.
4. Vitamins and minerals keep you healthy.
5. Water is needed in cells and body fluids.
6. Dietary fibre provides bulk to food to help it move through the gut.

What roles do bacteria and enzymes have in digestion?



Gut bacteria break down food to make some of the vitamins we need. Enzymes are proteins that turn large molecules into small molecules. Enzymes are biological catalysts, they speed up digestion without being used up. Carbohydrase turns starch into sugar, protease breaks down protein into amino acids and lipase breaks down lipids into fatty acids and glycer-

Cycle 2 Chemistry

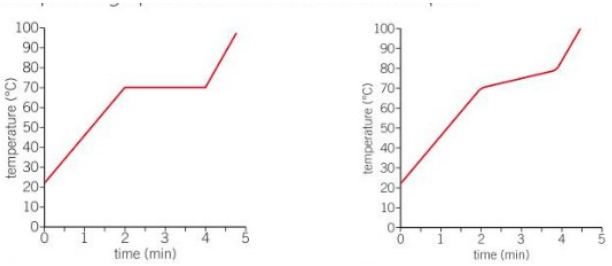
Word Bank

Element	Contains one type of atom.
Compound	Contains chemically combined elements
Mixture	Contains more than one substance.
Filtrate	The liquid collected during filtration.
Solution	A solute dissolved in a solvent.
Solute	The solid or gas that dissolves.
Residue	The solid collected during filtration.

What is the difference between a pure substance and a mixture?

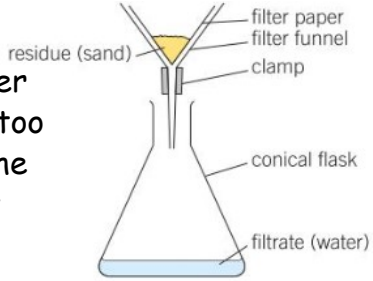
In chemistry, a pure substance contains only one substance. All of the particles are the same. In a mixture, there is more than one substance. A mixture can be made of elements or compounds or both but these are not joined together.

To find out if a substance is pure, you need to investigate its melting point. A pure substance has a fixed melting point.



How does filtration work?

You can separate sand and water using filter paper. The sand is too big too pass through holes in the paper but the water will easily pass through. The liquid that passes through is called the filtrate. The solid left behind is called the residue.



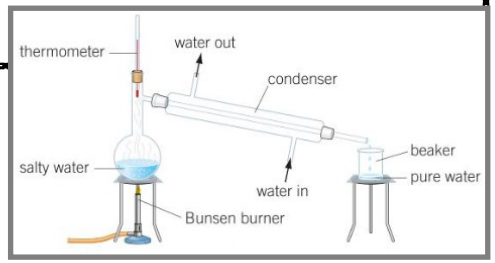
How does temperature affect solubility?

Solubility is the maximum mass of solute that will dissolve in a solvent. Most substances get more soluble as the temperature increases. We often show this on graphs. When a solution is saturated, no more solute will dissolve.

How can evaporation be used to separate a mixture?

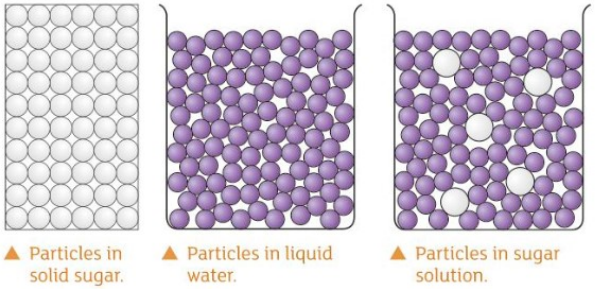
* Salt and water can be separated with evaporation.
* The mixture is heated until all water particles have enough energy to leave the surface.
* Only salt is left behind.

What is distillation? Distillation uses boiling and condensing to separate mixtures. They mixture is heated and one substance is turned into a gas, then back into a liquid. This works because of their different boiling points. You don't lose any of the mixture!



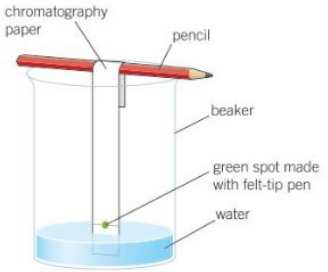
What happens when a substance dissolves?

- When a substance dissolves, water particles (or any solvent) surround the substance.



- The solvent isn't always water. It can be any liquid.
- The solute can be a solid or a gas. Fizzy drinks contain dissolved carbon dioxide.

How can chromatography be used to separate dyes?



Dyes are often a mixture of colours. To separate we can use chromatography.

The dyes dissolve in the water and travel up the paper at different speeds depending on how strongly they are attracted to the paper. A chromatogram will show the different results. If two spots on different chromatograms match, the substances contain the same dye!

Cycle 2 Physics

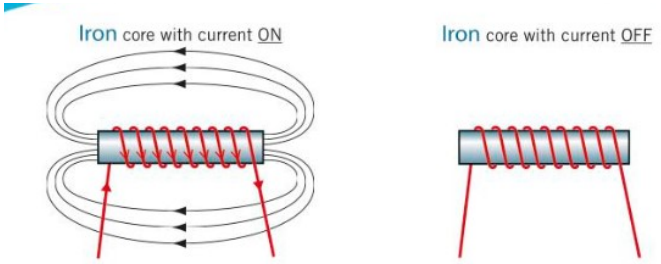
Word Bank

Pole	The ends of a bar magnet.
Field	The force around a magnet.
Current	Flow of charge (electricity)
Solenoid	A loop or coil of wire.
Loudspeaker	An electromagnet which produces sound.
Circuit breaker	A type of electromagnet. It is a safety device to prevent electrical fires.

What is an electromagnet?

A wire with a current flowing through it has a magnetic field. To make an electromagnet you need to wind lots of loops of wire (this is called a solenoid) . The wire should be connected to a power supply so current can flow.

Most electromagnets also have a core which is often made of iron. Iron easily loses its magnetism so the electromagnet can be switched on and off.



How can you make an electromagnet stronger?

The strength of an electromagnet depends on;

- The number of loops of wire—the more loops, the stronger the electromagnet.
- The current—bigger current means stronger electromagnet.
- The type of core—a magnetic material should be used.

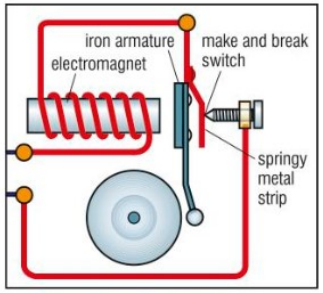
What is the difference between a permanent magnet and an induced magnet?

A permanent magnet has its own magnetic field.

An induced magnet will experience a force when placed in a magnetic field.

There is a magnetic field in a wire when a current flows?

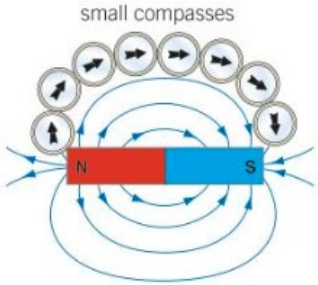
What are electromagnets used for?



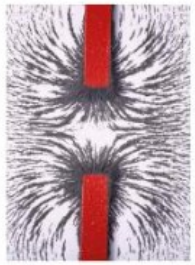
- Ringing bells
- Circuit breakers
- Loudspeakers
- Trains
- Scrap yard magnets

What are magnetic fields?

- A bar magnet has two poles. A North seeking pole and a south seeking pole.
- North seeking poles repel north seeking poles.
- South seeking poles repel south seeking poles.
- North seeking poles attract south seeking poles.
- Iron, Nickel, Cobalt and Steel all feel a magnetic force when placed in a magnetic field.
- A magnetic field is a force around a magnet. You can find this using plotting compasses or iron filings.
- The Earth has its own magnetic field and this is why we can use compasses to navigate.



▲ The field around a bar magnet.



▲ Two magnets repelling.