



KS3 Chemistry – Introduction to Chemistry and Acids and Alkalis



West Kirby
Grammar School

Learning about this topic is important because:

Chemistry is used all around us. Doctors use chemistry to make medicine that helps us when we are sick. Engineers use chemistry to make electronics like your TV and your cell phone. Farmers use chemistry to help their crops to grow so we can have food. Even chefs use Chemistry to cook delicious meals. By understanding Chemistry, you can better understand the world around you and how it works.

Acids and alkalis are not only found in chemistry labs, they are actually very common. We use acids and alkalis in our daily lives for things like cleaning, cooking and you even eat and drink some substances that are acidic or alkaline.

This builds on:

KS2 – Students should have some ideas on scientific investigations from KS2. KS2 – Properties of Materials; Solids, Liquids and Gases

This leads to:

Particles – *These skills are applied to and developed across their entire WKGS science career*

We will learn:

How do we stay safe in a laboratory?
How do we draw and name laboratory equipment?
How do we use laboratory equipment correctly and safely?
How do we record results?
How do we evaluate experimental data?
How do we use a Bunsen burner?
What is an acid?
What is an alkali?
What pH is an acid?
What pH is an Alkali?
What colour does universal indicator turn in an acid / neutral solution / alkali?
What is the general equation for a neutralisation reaction?
What are some examples of lab acids and alkalis?
What are some examples of everyday acids and alkalis?
What are some uses of acids and alkalis?

We will develop/practise skills including:

Accurately measuring volumes, mass and time; using appropriate equipment
Planning a fair scientific investigation
Identifying variables
Accurate recording of results in a results table
Accurately plot data in a bar chart or line graph
Drawing lines of best-fit
Identifying relationships between variables
Constructing word equations for the reactions in this topic
Using information and colour of indicators to determine the pH of a solution
Identifying variables in investigations
Risk assess practical work
Record data accurately
Analyse experimental data using graphs to draw logical conclusions using good science



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Some of the vocabulary that we will use includes:

Thermometer – A device used to measure temperature.

Hazard – Something that can cause harm or danger.

Acid – A substance with a pH less than 7.

Alkali – A substance with a pH greater than 7 that dissolves in water.

Neutralisation – A reaction in which an acid and an alkali react to form salt and water.

pH Scale – A scale from 0 to 14 used to measure how acidic or alkaline a substance is.

Indicator – A chemical that changes colour to show the pH of a substance.

Variable – Something that can be changed or measured in an experiment.

You could learn more about this topic by:

[Planning an experiment - Working scientifically - KS3 Science - BBC Bitesize - BBC Bitesize](#)

[Working safely in the lab - Working scientifically - KS3 Science - BBC Bitesize - BBC Bitesize](#)

[The pH scale - Acids and bases - National 4 Chemistry Revision - BBC Bitesize](#)



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

End of topic test

Assessed homework on the drawing graphs

Retrieval practice in unit booklet and regular whiteboard quizzes

Educake



Year 7 Chemistry – Particles



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Learning about this topic is important because:

Almost everything is made of particles. Particles can be atoms, molecules or ions. Particles behave differently in solids, liquids and gases. The particle model explains the differences between solids, liquids and gases.

This builds on:

KS2 – Properties of Materials; Solids, Liquids and Gases.

This leads to:

Acids & Alkalis; Atoms, Elements & Compounds

We will learn:

What is the particle model?

What are the properties of solids, liquids and gases?

What are the changes of state?

How can we describe changes of state using the particle model and the motion of particles?

How does the motion of particles change with temperature?

How can we describe expansion and contraction in terms of particles?

How can we describe diffusion and pressure in terms of particles?

We will develop/practise skills including:

Drawing solids, liquids and gases using the particle model

Predicting a substance's state of matter given relevant information

Drawing heating and cooling curve graphs

Analysing heating and cooling curves

Discuss the limitations of the particles model

Some of the vocabulary that we will use includes:

Particle – A tiny piece of matter, such as an atom or molecule.

Diffusion – The spreading of particles from an area of high concentration to an area of low concentration.

Boiling – The change of state from a liquid to a gas when heated to its boiling point.

Solid – A state of matter with a fixed shape and volume.

Evaporation – The change of state from a liquid to a gas at the surface of a liquid.

Condensing (Condensation) – The change of state from a gas to a liquid when cooled.

Liquid – A state of matter with a fixed volume but no fixed shape.

Expansion – The increase in size or volume of a substance when heated.

You could learn more about this topic by:

[KS3 - particles - BBC Bitesize](#)

[Particles - KS3 Science Lesson - YouTube](#)





Year 7 Chemistry – Particles



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Sublimation – The change of state directly from a solid to a gas without becoming a liquid first.

Gas – A state of matter with no fixed shape or volume and fills its container.

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End of topic test

Self-assessed homework on the particle model and changes of state

Teacher assessed homework on Heating and Cooling Curve and changes of state

Teacher Assessed homework on Density

Retrieval practice in unit booklet and regular whiteboard quizzes

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KS3 Chemistry – Separating Mixtures



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Learning about this topic is important because:

It is important to be able to separate mixtures to obtain a desired component from the mixture and to be able to better understand how each component contributes to the properties, chemical and physical, of the resulting mixture. It develops students understanding that the substances in a mixture are not chemical bonded.

This builds on:

Y7 – introduction to Chemistry (through use of equipment) and Y8 atoms, elements and compounds

This leads to:

GCSE topic: 4.1 Atomic structure and periodic table, understanding of context for various topics including reactions and/or solutions

We will learn:

What a mixture is and what the mixture contains
What is a solution, a solute and a solvent are
What soluble and insoluble means
What a precipitate is
Factors affect the rate of dissolving
What evaporation and crystallisation are and how to carry this out practically
What distillation is and how to carry this out practically
When to use the different separating techniques
How chromatography is carried out practically and why
How to calculate an R_f values and why
How to determine the most soluble substance from a chromatogram and/R_f values
What the mobile phase and stationary phases are

We will develop/practise skills including:

Use of equipment to carryout:
Evaporation
Distillation
Chromatography
Draw and label the required equipment for these practical
Calculating R_f values and using results to determine most/least soluble substance

Some of the vocabulary that we will use includes:

Mixture – Two or more substances that are not chemically joined.
Solute – A substance that is dissolved in a solvent.
Solution – A mixture formed when a solute dissolves in a solvent.
Solvent – A substance that dissolves a solute to make a solution.
Soluble – Able to dissolve in a solvent.
Insoluble – Unable to dissolve in a solvent.
Distillation – A method of separating substances by boiling and then condensing the liquid.

You could learn more about this topic by:

[Chemistry for Kids: Separating Mixtures \(ducksters.com\)](https://www.ducksters.com/chemistry/chemistry_for_kids_separating_mixtures.php)

[What is separation? - BBC Bitesize](https://www.bbc.com/bitesize/chemistry/topics/separating-mixtures/revision/1)

[KS3 Science \(turton.uk.com\)](https://www.turton.uk.com/ks3-science)





KS3 Chemistry – Separating Mixtures



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Chromatography – A method used to separate different substances in a mixture.

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

End of topic test
Assessed homework
Retrieval questions,
Mini white boards
Educake