

# Year 7 Science

## Term 3, 4 and 5



Biology topics: Classification and evolution, Breathing, Circulation and respiration

Chemistry topics: Elements, mixtures and compounds, The periodic table

Physics topics: Static and current electricity, Magnets, Light and sound

### Previous topic:

In term 1 and 2 we studied:

There are risks in the lab and there are ways we can keep ourselves safe.

All living things are made from cells, they are organised further to make organisms.

All matter is made of atoms. Different types of atoms are different elements. Atoms can be arranged as elements, compounds and mixtures.

Forces can cause objects to move accelerate or decelerate, this includes gravity, friction and air resistance. We can measure speed, acceleration, and other forces.

### Next topics:

Biomass, sampling and photosynthesis

Introduction to chemical reactions

Levers

### Core knowledge/skills/concepts

How does DNA make us who we are?

How can we sort living things?

How did living things evolve?

What's the point of breathing?

How do cells get what they need?

What does 'pure' mean?

How can we purify substances?

What is the periodic table?

What is electricity?

How does a magnet work?

Light and sound waves are different, what makes them both waves?



### Essential vocabulary

Base pair, chromosome, continuous data, discontinuous data, DNA, double helix, egg, environmental factor, gene, genetic, heredity, inherited factor, nucleus, sperm, offspring, selective breeding, species, fertile, extinction, trachea, lung, bronchi, bronchioles, alveoli, diaphragm, ribs, inhaling, exhaling, heart, circulatory system, surface area, thin wall, asthma, smoking.

Chromatography, dissolve, distillation, evaporation, filtrate, filtration/filter, insoluble, mixture, pure, residue, soluble, solute, solution, solvent

Element, compound, mixture, chemically bonded, periodic table, group, period, metal, non metal.

Electricity, voltage, current, voltmeter, ammeter, switch, bulb, wire, magnet, electromagnet, poles, field lines, series, parallel, forces.

### Threshold concepts

Variety can be caused by different **inherited factors**, **environmental factors** or both. DNA is organised into chromosomes which are stored in the nucleus. Genes are responsible for certain characteristics and are passed on from parents through sperm and egg cells.

Species have evolved over time due to changes in their environment. Adaptations make organisms well suited to their environment.

Gas exchange happens in the lung, the lung is organised to maximise gas exchange to allow respiration to occur in all cells in the body. Smoking and asthma can affect breathing and therefore respiration.

Aerobic respiration converts glucose and oxygen into carbon dioxide and water and releases energy. Anaerobic respiration occurs when there is insufficient oxygen, in humans this produces lactic acid.

A pure substance contains only one type of element, compounds or molecule. Purification can be achieved by a variety of separation techniques including filtration, evaporation, chromatography and distillation.

Elements are organised into groups and periods on the periodic table depending on their chemical and physical properties. Elements can be separated into metals and non metals.

The flow of charged particles is electric current, this can be measured using an ammeter. The 'oomph' with which the battery pushes the charged particles is the voltage, this can be measured using a voltmeter. Electricity can flow through conductors but not insulators.

Magnetic materials have magnetic field lines around them and this allows them to interact with other magnets, by attraction or repulsion. All magnets have a north and a south pole. Electromagnets can be made by wrapping a wire around an iron core, these can be turned off and on.

Light travels in straight lines that we describe as rays. Rays of light interact with objects in the environment and can be reflected, refracted, transmitted or diffracted. Light and sound are both waves. Sound moves via the vibration of particles. There are two types of waves; longitudinal and transverse.

### Opportunities for reading

BBC bitesize <https://www.bbc.co.uk/bitesize/subjects/zng4d2p>

BBC Newsround Science news stories <https://www.bbc.co.uk/newsround>

The Smart Science book will be used in lesson time.

### How and when will the core learning be assessed?

There will be lots of opportunities for formative assessment and TRIO in class time.

Educake homework once a fortnight, these test a wide range of knowledge, key words and concepts then provide students and staff with feedback.

In class summative assessment, in the form of a bespoke, 30 mark, written test at the end of each topic, students will complete TRIO on each of these afterwards. Staff will mark these and they will be standardised.

### Links to other topics/subjects

These topics have built on the core knowledge from terms 1 and 2 and will set students up with the core knowledge they need to continue their study through the rest of Year 7 and into Year 8

# Curriculum 'Glossary' and guidance



Students are learning about..... at this point in Year 7 because...

The 'why this and why now?' question

**Previous topic:** To support understanding of how the curriculum is sequenced

**Next topic:**

## Core knowledge/skills/concepts

Aspects that must be known without compromise and retained in the long-term memory (think of it as a checklist for teachers and students to work towards securing)

## Essential vocabulary

Tier 2 as well as Tier 3

Tier 2= valuable academic words that appear across the school curriculum e.g evaluate, authority, indicate (our 'word of the week' comes for Tier 2 vocabulary lists)

Tier 3= subject specific vocabulary

## Threshold concepts

'Gateway' concepts that are essential for students to be able to progress onto more complex ideas. In other words, they require mastery before moving onto other concepts.

## Opportunities for reading

## How and when will the core learning be assessed?

Formative assessment to inform responsive teaching and TRIO opportunities as well as summative assessment.

## Links to other topics/subjects

(we will create time to come together to really explore these)