

Unit and Year: A Healthy You Year 8

Purpose of Unit:

What do we need to stay healthy? In this unit you will discover the different food groups, the role of these in the body and how they actually get into your blood stream. You will discover how the nutrients are used and what we need to do to keep ourselves healthy

Key Learning/Knowledge:

Being able to describe and explain:

- The components of a healthy diet and their functions in the body.
- The effects of deficiencies or excesses of different nutrients on a person's health
- What health is
- A healthy gut
- What food contains and the energy contained in each food
- The structure and function of the digestive system
- The events that take place in turning a meal into simple food molecules
- Aerobic and anaerobic respiration

Key Words

Aerobic respiration- Breaking down glucose with oxygen to release energy and producing carbon dioxide with water

Anaerobic respiration- Releasing energy from the breakdown of glucose without oxygen

Balanced diet- eating food containing the right nutrients in the correct amounts

Carbohydrates- nutrients that provide the bodies main source of energy

Dietary fibre- parts of the plant that cannot be digested helping eliminate waste

Enzyme- substances that speed up the chemical reactions of digestion resulting in large molecules being broken down into small molecules

Gut bacteria- microorganisms that naturally live in the intestine and help break down food.

Large intestine- lower part of the intestine that absorbs water

Mineral- essential nutrient needed in small amounts to keep you healthy

Nutrient- essential substance that your body needs to survive, provided by food.

Rectum- stores faeces

Small intestine- upper part of the intestine where digestion is completed and nutrients are stored

Stomach- organ where food is mixed with acidic juices

Villi- tiny projections in the small intestine wall that increase the area for absorption

Key Skills:

- State
- Describe
- Explain
- Analyse data
- Using equations
- Recall of key content
- Application of key learning concepts
- Undertake scientific method during practical's
- Ability to analyse scientific models

Links to prior knowledge/learning:

- Animals, including humans, cannot make their own food
- The simple functions of different kind of teeth
- The digestive system in humans is made up of different parts, each with its own special function
- Humans need the right amounts of food and the right nutrients to be healthy

Unit and Year: Year 8 Chemical reactions

Purpose of Unit:

To develop an understanding of the different types of chemical reaction. Building on work from year 7 on particles and the periodic table. Students will be introduced to different types of chemical reactions including neutralisation, combustion, endothermic and exothermic.

Key Learning/Knowledge:

- to identify the indicators that a chemical reaction has taken place
- to explain the difference between an physical change and a chemical change with examples
- to identify chemicals as acid, alkali or neutral
- To describe what happens during a neutralisation reaction
- To identify the reactants and products of combustion
- to identify is a reaction is endothermic or exothermic
- To describe the role of chemical catalysts

Key Skills:

- To safely carry out practical experiments
- To recognise the indicators of a chemical reaction taking place
- To identify the reactants and products in a reaction
- To use word equations to represent reactions
- To use symbol equations to represent reactions
- To identify substances as acid, alkali or neutral using indicators such as universal
- To make predictions using the pH scale
- To accurately measure changes of temperature in experiments
- To identify the products of combustion using common gas tests

Key Vocabulary and meanings:

chemical change - irreversible change usually as the result of two substances combining to make a new product
physical change - reversible change that only affects the physical appearance of a substance
reactants - the substances that react together in a reaction
products - the new substance produced in a chemical reaction
equation - a written representation of a reaction using either words or symbols
acid - a solution with a pH of less than 7
alkali - a solution with a pH of more than 7
neutral - a solution with a pH of 7
pH scale - a numerical scale to show the levels of acidity and alkalinity
universal indicator - a substance that changes colour to show the pH of a solution
salt - chemicals formed by neutralisation reactions
exothermic - reactions that result in an increase in temperature
endothermic - reactions that result in a decrease in temperature
combustion - a chemical reaction that produces heat and light

Links to prior knowledge/learning:

Reversible and irreversible changes from KS2
Changes of state and dissolving from year 7
Making compounds from year 7

Unit and Year: Earth and beyond Year 8

Purpose of Unit:

To develop an understanding of the structure of the Earth, linking this to the rock cycle. To observe and explain ideas with regards to day, night, seasons and the solar system.

Key Learning/Knowledge:

- Describe how sedimentary rocks are formed and give examples
- Describe how metamorphic rocks are formed and give examples
- Describe how igneous rocks are formed and give examples
- Link the formation of all three rocks using an understanding of the rock cycle
- Identify the different parts on the structure of the Earth
- To explain why we have day and night
- To describe our sun as a star, other stars in our galaxy, other galaxies
- To describe what happens during a lunar and solar eclipse
- To describe the different phases of the moon
- To explain why we have different seasons
- To identify the planets that make up our solar system

Key Skills:

- To make observations of the properties of rocks, linking this to their formation
- To carry out practical activities safely in the lab
- To use models to describe what happens to cause day, night and seasons
- To interpret data

Key Vocabulary and meanings:

sedimentary rock – formed by the deposition of particles

sediment – matter which has settled to the bottom of a liquid

igneous rock – formed when magma within the Earth's crust crystallises

metamorphic rock – rock formed by the action of heat and pressure

seasons – changes in the climate through the year as the Earth moves around its orbit

solar system – our Sun and planets and other bodies that orbit around it

star – bodies in space which give out their own light

planet – any large body that orbits a sun in a solar system

moon – rocky body orbiting the Earth which is its natural satellite

satellite – any body that orbits another

Links to prior knowledge/learning: From KS2:

- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- describe in simple terms how fossils are formed when things that have lived are trapped within rock
- recognise that soils are made from rocks and organic matter
- describe the movement of the Earth and other planets relative to the sun in the solar system
- describe the movement of the moon relative to the Earth
- describe the sun, Earth and moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Unit and Year: Year 8 The Earth and the environment

Purpose of Unit:

To look at different habits, how animals are adapted to live within these habits, feeding relationships using food chains and web and the effect of bioaccumulation. Photosynthesis, the evolution of the Earth's atmosphere and human impact on this.

Key Learning/Knowledge:

- To identify different habitats and describe how organisms are adapted to survive in these habitats
- To construct food chains and food webs using information about feeding relationships
- To explain the impact of the bioaccumulation of microplastics/toxins
- To describe the process of photosynthesis explain how the plant is adapted to support this process
- To describe the need for nutrients to support plant growth
- To describe the Earth's atmosphere and explain how it has evolved
- To describe the effect of human activity on the Earth's atmosphere and climate
- The Earth as a finite source of resources and the need to reduce, reuse and recycle

Key Skills:

- To observe organisms in their natural habitat and identify the ways in which they are adapted to survive
- To analyse data collected to form conclusions about adaptations
- to interpret food webs and make predictions concerning the populations of organisms in a food web
- to develop microscope skills to observe the stomata in the leaves of plants
- to interpret graphical data

Key Vocabulary and meanings:

habitat - a place where a plant or animal lives

adaptation - features of living organisms that help them survive

food chain - a series of organisms each dependent on the next as a source of food

food web - a system of interlocking and interdependent food chains

energy transfer - the changes in energy that occur in and between organisms within an ecosystem

bioaccumulation - the gradual accumulation of substances, such as pesticides or other chemicals, in an organism

photosynthesis - the process by which plants make their own food

stomata - holes in leaves which allow gases to go in and out of the leaf

atmosphere - the layer of air above the Earth's surface

climate change - changes in the Earth's average temperature

recycle - the process of converting waste materials, that would usually be thrown away, into new materials and objects

Links to prior knowledge/learning:

Students will have covered ideas concerned with habitats and food chains at KS2. Students will have also looked at the importance of recycling at KS2

Unit and Year: Electric circuits and magnets Year 8

Purpose of Unit:

Develop an understanding of how to build simple electric circuits; to take electrical measurements to compare different circuits

Be able to describe the magnetic field around a bar magnet

Key Learning/Knowledge:

- To be able to identify common electrical symbols
- Be able to build series and parallel circuits
- Be able to measure current in series and parallel circuits
- Be able to measure the voltage in a series circuit
- Be able to calculate the resistance of a series circuit
- Be able to describe the differences in resistance of a conductor and insulator
- Be able to describe the effects of a bar magnet
- Be able to determine the shape and direction of a magnetic field of a bar magnet
- Be able to apply knowledge of magnets to the Earth and navigation
- Be able to describe the effects of a current on electromagnets and dc motors

Key Skills:

- Be able to recall the common electric symbols
- Be able to build series and parallel circuits
- Be able to measure electric current and voltage
- Be able to calculate resistance in a circuit
- Be able to determine the shape and direction of a magnetic field around a bar magnet
- Be able to investigate the effects of current on electromagnets and dc motors

Key Vocabulary and

meanings:

Components - Electrical parts of a circuit e.g lamp, voltmeter.

Charge - Particle that moves around a circuit, e.g. electron.

Series circuit - a circuit with only one path for the electric current to 'flow' along.

Parallel circuit - a circuit with more than one path for the electric current to 'flow' along.

Current - a measure of the number of charges passing a point in the circuit.

Amps - units that current is measured in.

Voltage - the energy difference between 2 points in a circuit

Volts - units voltage is measured in

Resistance - how hard it is for the current to pass through the circuit

Ohms - units resistance is measured in.

Conductor - a substance that electricity can 'flow' through

Insulator - a substance that electricity cannot 'flow' through

Magnet - something that attracts certain metals

Poles - the two ends of a magnet; North and South poles.

Magnetic field lines - the area around a magnet that affects magnetic substances

Links to prior knowledge/learning:

Unit and Year: Materials Year 8

Purpose of Unit:

Develop an understanding of how metal and non-metal elements and their oxides react and the differences in their chemical properties.

Key Learning/Knowledge:

- To understand how the periodic table is arranged.
- To understand the differences in properties of metals and non-metals.
- To understand the order of reactivity of metals.
- To describe how metals and non-metals oxides react with acids.
- To describe displacement reactions.
- To understand how metals are extracted from metal compounds.
- To understand what an acid and an alkali are.
- To place metals into order of reactivity.
- To describe different alloys and their uses.
- To understand the properties and uses of polymers, ceramics and composites.
- To undertake testing of gases produced in reactions.
- To write word equations and symbol equations for chemical reactions.

Key Skills:

- To describe how the periodic table is arranged.
- To discuss the differences in properties of metals and non-metals.
- To understand how to name compounds.
- To describe and perform tests for gases produced in chemical reactions.
- To place metals in order of reactivity.
- To balance symbol equations.
- To describe the properties and uses of polymers, ceramics and composites.
- To perform metal displacement reactions.
- To extract metals from metal compounds.
- To perform chemical reactions.
- To work safely in a laboratory.

Key Vocabulary and

meanings:

Periodic Table - shows all the discovered elements in order of increasing atomic number.

Element - a substance that contains only one type of atom.

Compound - a substance made up of atoms from different elements, bonded together.

Molecule - two or more atoms bonded together.

Chemical Formula - a formula that shows the proportion of atoms of each element in a compound.

Polymer - made by joining lots of small molecules in long chains.

Ceramic - made by heating substances to high temperature. e.g. Clay.

Composite - made from two or more types of material.

Alloy - a mixture of a metal and another element e.g. Brass, Steel.

Displacement reaction - when a more reactive element displaces a less reactive element from its compound.

Acid - A solution which has a pH <7.

Alkali - A solution which has a pH >7.

Catalyst - a substance which speeds up a chemical reaction without being changed or used up in the chemical reaction.

Links to prior knowledge/learning:

Year 7 The Periodic Table