

Science Age 8-9

(A) *Life and living things*

1. Humans and animals

Movement (bones and muscles)

- humans and some other animals have skeletons and muscles to support and protect their bodies and to help them to move
- animals with internal skeletons are called vertebrates

Study the role of the skeleton in providing support, protection and movement and the location of the skull, backbone (vertebral column), rib cage, pelvis, collarbone and shoulder blade

Circulation

- the heart acts as a pump to circulate the blood through vessels around the body, including through the lungs
- study very simply the structure of the heart to show how the heart forces blood round the body to the organs through arteries and that the blood returns to the heart through veins
- study the effect of exercise and rest on pulse rate (i.e. that during exercise the body needs more oxygen and food to provide the necessary energy). Demonstrate this by comparing pulse rates at rest and after exercise.

2. Green plants

Growth and nutrition

- the air supplies a plant with carbon dioxide for making food and that plants also need oxygen
- the role of the leaf in producing new material for growth (green plants use energy from the Sun to produce food (photosynthesis))
- the role of the green pigment (chlorophyll) in the leaf and stem in capturing this light energy
- the root anchors the plant, and that water and minerals are taken in through the root and transported through the stem to other parts of the plant. Investigate how mineral salts are nutrients which are needed for healthy growth.

(B) *Materials, their properties and the earth*

1. Grouping and classifying materials

- some materials are better thermal insulators than others
- that air is a good insulator. Give examples of situations where trapped air is used for insulation in everyday life, e.g. winter clothing, sleeping-bags

2. Changing materials

- carry out simple dissolving experiments
- learn about **reversible changes**, including dissolving, melting, boiling and freezing (heating or cooling can cause a change of state e.g. in water, butter; water expands on freezing, causing pipes to burst and rocks to crack)
- compare different temperatures by feel and by the use of a thermometer. Learn to read a thermometer scale and the boiling point and freezing point of water, and the temperature of a healthy human

3. Separating mixtures of materials

- some solids [e.g. salt, sugar] dissolve in water to give solutions but some [e.g. sand, chalk] do not. Understand the terms soluble, insoluble, solute, solvent, solution.
- separate insoluble solids from liquids by filtering. Carry out simple filtration experiments and decanting. Understand the terms filtrate and residue.

(c) *Energy, forces and space*

1. Magnetism

- Learn about the forces of attraction between magnets and magnetic materials
- use the terms metal, non-metal, magnetic and non-magnetic: classify materials into magnetic and non-magnetic groups
- magnetic materials such as iron and steel are attracted to a magnet: carry out experiments to discover that a magnet exerts a force on another magnet or any piece of magnetic material which is placed close to it
- a magnet has north-seeking and south-seeking poles (why they are so called?). A freely suspended bar magnet comes to rest in a north-south direction and acts as a compass. Like poles repel and unlike poles attract each other
- learn that magnetic effects will pass through some materials.
- Compare the strength of two or more magnets

2. Light and Sound

- we see things only when light from them enters our eyes. Draw simple diagrams to show that light rays, travelling in straight lines, enter the eyes directly from a luminous object
- sounds are made when objects [*e.g. strings on musical instruments*] vibrate or when the air inside an object vibrates (e.g. a recorder, a milk bottle). Use the terms vibrate and vibration.
- demonstrate that vibrations are not always visible e.g. vibrations in a drum skin shown by using rice grains
- change the pitch and loudness of sounds produced by vibrating objects [*e.g. a drum skin, a plucked string*]. Use the term pitch
- the properties of sound such as pitch and loudness can be changed. An increase/decrease in the size of the vibration produces a louder/quieter sound; a faster/slower vibration produces a higher/lower-pitched sound. Show that on a stringed instrument, changing the length, tightness and thickness of a string will affect the pitch of a note.
- vibrations from sound sources require a medium [*e.g. metal, wood, glass, air*] through which to travel to the ear. Sound travels through solids, liquids and gases but not through a vacuum and these vibrations are detected by the ear.

3. The Earth and beyond

The Sun, Earth and Moon: Periodic changes

- study how day and night are related to the spin of the Earth on its own axis. Use a globe and lamp representing the Earth and Sun in order to show how day and night arise
- learn about practical examples relating to the apparent movement of the Sun, e.g. sundials
- know that the Earth orbits the Sun once each year, and that the Moon takes approximately 28 days to orbit the Earth