Year 4 Science

ALL TOPICS will be taught using practical scientific methods

Sound

Objectives	Notes and guidance	Activities/Experiments
-Observe and name a variety of sources of sound, noticing that we hear with our ears. -Identify how sounds are made, associating some of them with something vibrating. -Recognise that sounds get fainter as the distance from the sound source increases. -Find patterns between the pitch of a sound and features of the object that produced it. -Find patterns between the volume of a sound and the strength of the vibrations that produced it.	-Linked with work in music, pupils should explore various ways of making sounds, for example using a range of musical instruments to make louder and softer, and higher and lower sounds.	-Work scientifically by: exploring how the pitch and volume of sounds can be changed in a variety of ways, and finding patterns in the data (for example, blowing across the top of bottles, changing the length and thickness of elastic bands). They might make ear muffs from a variety of different materials to investigate which provides the best insulation against sound.

Light

Objectives	Notes and guidance	Activities/Experiments
-Observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes. -Notice that light is reflected from surfaces. -Associate shadows with a light source being blocked by something; find patterns that determine the size of shadows.	-Explore materials to help them to understand the differences between the meaning of transparent, translucent and opaque. --Observe shadows being formed in everyday contexts, such as when they play outside or shine torches indoors. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.	-Work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes; investigating the suitability of materials for different purposes, such as blackout curtains; exploring whether shiny things shine in the dark.

Rocks and Soils

Objectives	Notes and guidance	Activities/Experiments
-Compare and group together different kinds of rocks on the basis of their simple physical properties. -Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). -Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock.	-Explore different kinds of rocks and soils, including those in the local environment. **Note:** Pupils are not expected to be taught about the formation of metamorphic rocks, such as marble and slate.	-Work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. -Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.

Evolution and Inheritance

Objectives	Notes and guidance	Activities/Experiments
-Identify how plants and animals, including humans, resemble their parents in many features. -Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. -Identify how animals and plants are suited to and adapt to their environment in different ways.	-Introduce the idea that characteristics are passed from parents to their offspring, for instance by exploring the family trees and family resemblances of historical personalities such as the Royal family, celebrities. **Note:** At this stage, pupils are not expected to understand how genes and chromosomes work.	-Radish experiment – mix different food colourings onto radish seeds – do the plants become the some colour? -Traveling plants –can seeds survive in salty water? Thereby they could travel across the sea.

Classification of living things and Habitats

Objectives	Notes and guidance	Activities/Experiments
-Identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups. -Give reasons for classifying plants and animals based on specific characteristics. -Recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats.	-Use the local environment throughout the year to identify and study plants and animals in their habitat; and how the habitat changes throughout the year. Pupils should classify animals into the major groups such as: vertebrates (animals with backbones) into fish, amphibians, reptiles, birds, and mammals; invertebrates into snails and slugs, worms, spiders, and insects. -Explore examples of human impact (both positive and negative) on environments such as the effect of population and development, litter or deforestation. **Note:** Plants are more difficult to classify, but can be grouped into categories such as trees, grasses, flowers, and non-flowering plants such as ferns and mosses.	-Work scientifically by: exploring local small invertebrates and using guides or keys to identify them; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.

Plants - Functions

Objectives	Notes and guidance	Activities/Experiments
-Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers -Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. -Investigate the way in which water is transported within plants. -Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	-Introduced to the relationship between structure and function: the idea that every part has a job to do. This teaching should focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. **Note:** Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.	-Work scientifically by: comparing the effect of different factors on plant growth, for example the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant cycles over a period of time; looking for patterns in the structure of seeds that relate to how they are dispersed. -Observe how water is transported in plants, for example by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.