Cantrell Primary School Science Curriculum

Year 3: Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

3.1 asking relevant questions and using different types of scientific enquiries to answer them

3.2 setting up simple practical enquiries, comparative and fair tests

3.3 making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

3.4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

3.5 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

3.6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

3.7 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

3.8 identifying differences, similarities or changes related to simple scientific ideas and processes

3.9 using straightforward scientific evidence to answer questions or to support their findings.

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Year 3: Rock Detectives – How are rocks, soil and fossils connected?

NC reference: Rocks

Objectives:

- 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

Key Factual Learning:

- ✓ Rocks are a natural material.
- ✓ Rocks can be classified by the way they are formed and their appearance.
- ✓ Rocks can be hard or soft. Hard rocks include granite. Soft rocks include limestone.
- ✓ There are human-made rocks such as concrete.
- ✓ Rocks can change over time.
- ✓ Soil is found on land and is the top layer of the Earth. It is formed when small rocks and organic materials are mixed together.
- ✓ Some rocks may contain fossils.
- ✓ Fossils occur when plants or animals that have lived become trapped in rocks over millions of years.
- ✓ Mary Anning was a famous fossil hunter who discovered fossils in England.

Practical Tasks (Working Scientifically):

- Look at a collection of rocks and observe and classify them. **3.4, 3.9**
- Sort and classify rocks making a key using post it notes and actual rocks. **3.4**
- Explore the school grounds to find how rocks are used in our environment. **3.4**
- Use evidence from the rock walk to classify and research how and why rocks are chosen and used. **3.4, 3.5**
- Test rocks to investigate their hardness by using a scratch test then order them from hardest to softest. Suggest when a hard rock might be more useful than a soft one. **3.2-3.5**
- Investigate how much water a rock absorbs or repels –consider are rocks waterproof? **3.2-3.5**
- Observe how rocks change over time in a range of places. **3.8-3.9**
- Observe different types of soils. **3.4, 3.9**
- Classify and research how some soils are formed. **3.4, 3.9**
- Investigate the water retention of soils. **3.1-3.5**
- Observe how soil can be separated through sedimentation. **3.8**
- Explain how fossils are formed and explain the difference between a bone and a fossil. Order the steps of how a fossil is formed. **3.9**
- Classify fossils and observe a range of different fossils **3.4, 3.9**
- Research Mary Anning and create fact file of information about this paleontologist. **3.5, 3.6**

Key Vocabulary:

rock, sedimentary, igneous, metamorphic, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, paleontology, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil

Cross-Curricular Links:

History – Egyptian Farming and the Nile and (link to dinosaurs and **Mary Anning** – mother of palaeontology)
Geography – Earthquakes and Volcanoes (link to **Alfred Weggener** 1910 German scientist Continental drift theory – plate tectonics)
Computing – Research and presenting findings
English – Creating fact file and Volcanoes booklet

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Year 3: What are the attractions of magnets?

NC Reference: Forces and magnets

Objectives:

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

Key Factual Learning:

- ✓ Forces are pushes or pulls.
- ✓ We cannot see forces but may feel their effects.
- ✓ Magnetic forces can act at a distance and attract some materials and not others.
- ✓ Some metals are magnetic (iron is magnetic) and others are non-magnetic.
- ✓ Magnets have different strengths and we can measure this.
- ✓ Magnets have two poles – a north pole and south pole.
- ✓ Magnets can attract each other and this depends on the opposite poles being put together.
- ✓ Magnets repel each other when like poles come together.
- ✓ Magnets have a field of magnetism.

Practical Tasks (Working Scientifically):

- Describe the push and pull forces in action from a range of sources such as photographs or video clips. **3.5**
- Carry out an investigation to explore how objects move on different surfaces, spinning top/coins, rolling balls/cars, clockwork toys, soles of shoes. **3.1-3.5**
- Sort materials into magnet and non-magnetic and identify which materials are magnetic. **3.4, 3.9**
- Test the strength of a magnet. **3.2-3.5**
- Investigate the polarity of a magnet and test which ends attract and which ends repel each other. **3.5, 3.8, 3.9**
- Observe the magnetic field of a magnet. **3.3**
- Research the uses of magnets and forces in our everyday life. **3.4**

Key Vocabulary:

push, pull, twist, force, air, turns, fast, slow, slows down, material, surface, magnet, magnetic fields, attract and repel, magnetic material, magnetism, non-magnetic material, metal, non-metal, strength, north pole, south pole.

Cross-Curricular Links:

English - Shared Reading – Iron Man
Geography – Planet Earth – structure of earth – layers including the inner and outer core which are made from iron and nickel and produce a magnetic field
History - **William Gilbert** (1540-1603) was the first to investigate the phenomenon of magnetism systematically using scientific methods. He also discovered that the Earth is itself a weak magnet.

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Year 3: How does light help us to see?

NC Reference: Light

Objectives:

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows changes.

Key Factual Learning:

- ✓ We need light in order to see objects.
- ✓ Dark is the absence of light.
- ✓ Objects reflect light in different ways and amounts.
- ✓ We do not look directly at the sun as it can damage our eyes
- ✓ The good effects of the sun are it helps us to make vitamins to keep healthy.
- ✓ The bad effects of the sun are skin or eye damage over long periods of exposure.
- ✓ We can protect our eyes from the harmful rays of the sun by not looking directly at the sun and by wearing a hat or sunglasses on sunny days.
- ✓ Reflective materials can keep us safe at night.
- ✓ Mirrors reflect light into our eye and show us an image.
- ✓ Shadows are formed when an object blocks light.
- ✓ Sources of light can be changed to change the shape of a shadow.

Practical Tasks (Working Scientifically):

- Identify and sort sources of light. **3.4**
- Investigate the absence of light or darkness on small objects. **3.4**
- Rank objects from least shiny to most shiny. **3.1, 3.4**
- Design a bookbag that has a suitable reflective material in its design for use at night.
- Create a fact file about the good and bad effects of the sun. Design some sunglass or hat to help with protection. **3.4, 3.6**
- Test mirrors and the effects they have. **3.1, 3.8, 3.9**
- Draw and label pictures of their shadows outside. **3.4**
- Investigate changing shapes of shadows. **3.1-3.5, 3.7**

Key Vocabulary:

Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous

Cross-Curricular Links:

English – The Lighthouse

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Year 3: How do the different parts of a plant help it to grow and reproduce?

NC Reference: Plants

Objectives:

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, 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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Key Factual Learning:

- ✓ Many plants (but not all) have roots, stem/trunk, leaves flowers/blossoms.
- ✓ Roots absorb water and nutrients form the soil and anchor the plant.
- ✓ The stem transports water and nutrients around the plant and holds the pliant upright.
- ✓ The leaves use sunlight to produce the plant's food.
- ✓ Some plants produce flowers to enable them to reproduce.
- ✓ Pollen is made by the male part of the plant and this is transferred to the female part of another plant and this is called pollination.
- ✓ After pollination, seeds are formed sometimes in berries or fruits and these can be dispersed in a different way.
- ✓ Plants need different conditions for growth and germination.

Practical Tasks (Working Scientifically):

- Label parts of a plant and explain their functions. **3.4**
- Observe the effects of plants that have their leaves or root removed. **3.5**
- Explore the effects of plants growing without light, water or heat and compare outcomes. **3.1-3.5, 3.7**
- Study and dissect a flower to identify parts of the reproductive system. Compare with other flowers used in room. **3.4**
- Identify and label the male and female reproductive structures of flowers. **3.4**
- Explore and research seed dispersal to create a booklet. **3.4, 3.6, 3.7**
- Classify seeds by their dispersal. **3.4**
- Describe the life cycle of a flowering plant and explain each step. **3.4-3.7**
- How plant adapt to their environments **3.3, 3.4, 3.8, 3.9**

Key Vocabulary:

Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal

Cross-Curricular Links:

Visit Bulwell Forest Gardens
Visit local environment
Art – Observational drawings

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Year 3: What do all living things need to survive?

NC Reference: Animals, including humans

Objectives:

- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat

- identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Key Factual Learning:

- ✓ A habitat is used to describe where a living thing lives and an example maybe a woodland or an ocean.
- ✓ Animals can be sorted according to a range of groupings such as mammals, reptiles, mollusc, amphibians, insects and birds.
- ✓ There are some life processes that all organisms have in common.
- ✓ Land animals breathe using lungs but fish have gills.
- ✓ Humans and some other animals have a skeleton and muscles that help them to move and provide protection and support
- ✓ Animals need to eat in order to get nutrients, unlike plants that make their own food.
- ✓ Foods have a range of different nutrients that are needed by the body to stay healthy.

Practical Tasks (Working Scientifically):

- Learning/ researching the seven life processes (MRS NERG) **3.4**
- Research food groups such as carbohydrates, sugars, proteins, vitamins, minerals, fibre, fats and water. **3.4**
- Design a healthy diet for a human containing a good balance of nutrients. **3.4, 3.9**
- Compare and contrast the diets of different animals and decide on ways of grouping them according to what they eat. **3.4-3.5**
- Research how and why animals need to move. Consider why humans and some animals have a skeleton. **3.4, 3.9**
- Research and compare vertebrate and invertebrates (such as humans, fish and other undersea creatures). **3.4, 3.9**
- Research and investigate muscles in the body and how they help us to move using a variety of PE based tests. **3.1, 3.9**
- Sort animals into correct habitats. **3.4**
- Grouping animals by appearance and habitats. **3.4**
- Looking at pictures and video clips of mammals and sea animals to identify how they respire. **3.9**
- Investigate a pattern seeking question such as can people with longer femurs jump further? **3.1-3.5**

Key Vocabulary:

Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints

Cross-Curricular Links:

Spring term Year 3 topic - 'Under the Sea'
English – research for Non-chronological reports about Sea creature; Dougal's Deep-Sea Diary
D&T – make a sea creature from felt
Art – sketch and paint sea creatures to create a sea scene