

Manor Primary School

Science Year 5: Earth and Space

Overview of the Learning:

In this unit of learning children will investigate the movement of the Earth, and other planets, relative to the Sun in the solar system. Pupils will explore the movement of the Moon relative to the Earth. Children will use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. They will investigate the phases of the moon. They will investigate At what times does the Sun set and rise at different points in the year?

Core Aims

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics about humans and other animals
- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

Pupils should be taught to work scientifically. They will:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Pupils should be taught about the Earth and Space:

- 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.



Expectations

Children can:

- 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.



Manor Primary School Science Year 5: Forces in Action

Overview of the Learning:

In this unit of learning children will investigate forces in action (gravity, air resistance, up thrust, friction) and make links to these forces in everyday life. They will investigate impact of variables upon these forces. The main focus is investigative learning where children will be: asking questions that can be answered by different types of investigative activity and decide the best approach to use; making predictions based on scientific knowledge; carrying out fair tests; making measurements and repeating them and finding averages to test accuracy of results; presenting findings in graphs, charts and tables and drawing conclusions that utilise more than one piece of supporting evidence, including numerical data and line graphs. They will devise criteria to evaluate their approaches, products and outcomes

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Pupils should be taught about forces:



- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Expectations

Children can:

- compare and give reasons, based on testing, for how forces, including gravity, friction, air and water resistance, affect the movement of a variety of objects
- explain, through observation, that forces push and pull objects, making them change shape, and that there is always something doing the pushing or pulling either by contact or at a distance
- explain that drag forces tend to slow things down, including air resistance and, to a greater extent, resistance in liquids
- measure the size of a force.
- explain that there are forces of attraction and repulsion between magnets, and there are forces of attraction between magnets and magnetic materials
- Know that objects are pulled downwards because of the gravitational attraction between them and the Earth
- Understand that friction, including air resistance, is a force that slows moving objects and may prevent objects from starting to move
- Know that when objects [for example, a spring, a table] are pushed or pulled, an opposing pull or push can be felt
- measure forces and identify the direction in which they act.
- explain the weight is a force and is measured in newtons and that the greater the weight the greater the force
- explain that friction is a force that tries to stop things moving against each other



- know that gravity is a force that pulls all objects towards the Earth
- understand that upthrust is a force that pushes up on objects in water
- know that air resistance is a force that can only work when an object is moving and works against the direction of movement

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Science Year 5: Investigating The Cycle of Life Green Plants!

Overview of the Learning:

In this unit of learning children will investigate how plants reproduce as part of their life cycle and that in every life cycle there are distinct processes and stages. They should begin to understand how reproduction is important to the survival of the species.

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Pupils should be taught about the Cycle of Life Green Plants:

- The 7 characteristics for living things:



Feeding/nutrition – by the process of photosynthesis green plants use the energy of sunlight to combine carbon dioxide and water to produce carbohydrates, which they use as their energy source for growth and other life processes.

Respiration – this is the process whereby plants release energy from their food, using oxygen from the air or dissolved in water.

Excretion – plants get rid of waste materials produced as a result of processes taking place in their cells.

Sensitivity – is the ability to respond to stimuli and modify behaviour because of this.

Movement – the leaves of the plants turn towards the Sun and their roots grow in the direction of the water.

Growth – is the increase in size and complexity of a living thing.

Reproduction – a plant can pass on its genetic material to a new generation of offspring.

- **The parts of plants and their uses:**

Roots – for absorbing water

Stem – for holding the plant upright

Leaves – this is where the plant will make its food

Flower – these contain the reproduction parts for the plant

Fruit – these contain the plants' seeds.

Some vegetables are swollen tubers or roots like carrots, parsnips and turnips. Cauliflower and broccoli are flowers. Celery and rhubarb are stems. Leaves of some plants are poisonous (e.g. tomatoes), but cabbage and lettuce are edible leaves. Potatoes are grown underground on stems. Nuts are defined as having no soft covering around the seed. Fruits have soft covering nuts; the protection to the seed is hard.

- **Reproduction:**

Germination is when the seed begins to develop into a plant.

Pollination is when the pollen from one plant reached the anther of another plant.

Fertilisation is when the pollen attaches to the ovum.

The female part of the flower is called the carpel. This consists of the stigma, style and ovary. The stigma catches the pollen grains. The style connects the stigma to the ovary. The ovary contains one or more ovule (female sex cells). The male parts of the



plant are the stamen. These consist of anthers (contains 4 pollen sacks) and filament which hold the anther in place. The petals can be brightly coloured to attract insects. The sepals are generally green and protect the flower prior to opening.

- **Conditions for growth**

Seeds need water and warmth

To grow, plants need light, as well as water. The range of temperatures that plants grow at varies across the world. This is an example of adaptation.

- **Seed dispersal**

There are a variety of methods of dispersal - animal (blackberry, cherry, apple all eaten and then excreted elsewhere, mistletoe sticks on birds beaks, burrs stick to fur, nuts buried by squirrels), water (mangoes, water lily, coconuts) wind (sycamore, poppy), explosion (lupins, peas, beans, gorse, grom) and fire (e.g. serotinus pine trees; the lodge pole pine and the jack pine).

Expectations

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Science Year 5: Properties and changing materials

Overview of the Learning:

In this unit of learning children will investigate changes of state which can be reversed. Children will investigate evaporation and condensation. They use their understanding to explain a range of familiar phenomena. This unit of study will mostly concentrate on mixing materials together to form mixtures – substances that are physically not chemically combined.

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Pupils should be taught about properties and changing materials:

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating



- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Expectations

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