

# Manor Primary School

## Science Year 2: Investigating Animals Including Humans

<b>Overview of the Learning:</b> <p>In this unit children will learn that animals (including humans) grow and reproduce. They can use ideas about feeding and growth to learn about ways we need to look after ourselves to stay healthy. Children will also have opportunities to consider ways in which science is relevant to their personal health and to relate science to aspects of their everyday life (food, exercise, medicines), and to recognise and control hazards and risks to themselves</p>	
<b>Core Aims</b> <ul style="list-style-type: none"><li>develop <b>scientific knowledge and conceptual understanding</b> through the specific disciplines of biology, chemistry and physics about humans and other animals</li><li>develop understanding of the <b>nature, processes and methods of science</b> through different types of science enquiries that help them to answer scientific questions about the world around them</li><li>are equipped with the scientific knowledge required to understand the <b>uses and implications</b> of science, today and for the future.</li></ul>	<b>Pupils should be taught to work scientifically. They will:</b> <ul style="list-style-type: none"><li>ask simple questions and recognising that they can be answered in different ways</li><li>observe closely, using simple equipment</li><li>perform simple tests</li><li>identify and classifying</li><li>use their observations and ideas to suggest answers to questions</li><li>gather and record data to help in answering questions.</li></ul> <b>Pupils should be taught about:</b> <ul style="list-style-type: none"><li>notice that animals, including humans, have offspring which grow into adults</li><li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li><li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li><li>to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. E.g. egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.</li></ul>

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- Pupils will work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.

### Expectations

Children can:

- Describe that animals, including humans, have offspring which grow into adults
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
- Understand the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. E.g. egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.
- work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans
- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions.

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# Manor Primary School

## Science Year 2: Investigating Changing Materials

### Overview of the Learning:

In this unit of learning children will identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. They will explore and investigate how materials can be changed by heating and cooling or by the processes such as bending and stretching. They will investigate changes that are reversible (and classify them as so) such as freezing water, and non reversible such as baking cakes. Children will also investigate how we can recycle products changing their appearance and purpose

### 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:

- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions.

### Pupils should be taught about materials

- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting, stretching, heating and freezing.
- identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass).

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- think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials.
- Find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.
- Work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places observing closely, identifying and classifying the uses of different materials, and recording their observations.

### Expectations

Children can:

- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting, stretching, heating and freezing.
- identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass).
- Describe how the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials.
- Describe how people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.
- Work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places observing closely, identifying and classifying the uses of different materials, and recording their observations.
- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions.

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# Manor Primary School

## Science Year 2: Investigating Electricity

### Overview of the Learning:

In this unit of learning children will explore and investigate simple electrical circuits and find out how electricity is used in the home, at school and in some products. Children will make simple circuits and investigate how switches work in circuits. They will explore what materials conduct electricity. They will investigate how to incorporate several devices into a circuit and how to increase and decrease the brightness of a bulb.

This unit of work links to children's work on **investigating materials**

### 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:

- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions.

### Pupils should be taught about electricity

- That everyday appliances use electricity; these include things that light up, heat up, produce sounds and move
- that everyday appliances are connected to the mains and that they must be used safely
- That batteries provide a source of portable electricity
- to make a complete circuit using a battery, wires and bulbs
- explore how to make a bulb light, explaining what happened, and using drawings to present results
- To make a complete circuit that can be controlled using a switch
- To investigate the best materials to make a switch work,
- To make some accurate observations and whole number measurements relevant to questions or ideas under investigation

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- To identify one or more control variables in investigations from those provided
- To use scientific forms of language when communicating simple scientific ideas,
- Describe what they have found out in experiments or investigations, linking cause and effect

### Expectations

Children can:

- Describe everyday appliances that use electricity; these include things that light up, heat up, produce sounds and move
- Describe how everyday appliances are connected to the mains and that they must be used safely
- Create a complete circuit using a battery, wires and bulbs
- explore how to make a bulb light, explaining what happened, and using drawings to present results
- Make a complete circuit that can be controlled using a switch
- Describe the best materials to make a switch work,
- Make accurate observations and whole number measurements relevant to questions or ideas under investigation
- Identify one or more control variables in investigations from those provided
- Use scientific forms of language when communicating simple scientific ideas,
- Describe what they have found out in experiments or investigations, linking cause and effect
- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- Gather and record data to help in answering questions.

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## Science Year 2: Investigating plants

<b>Overview of the Learning:</b> In this unit children observe inside seeds and bulbs and describe how they grow into mature plants. They find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Find seeds in the local environment. These sessions are written in line with the new National Curriculum (published in 2013).	
<b>Core Aims</b> <ul style="list-style-type: none"><li>develop <b>scientific knowledge and conceptual understanding</b> through the specific disciplines of biology, chemistry and physics about humans and other animals</li><li>develop understanding of the <b>nature, processes and methods of science</b> through different types of science enquiries that help them to answer scientific questions about the world around them</li><li>are equipped with the scientific knowledge required to understand the <b>uses and implications</b> of science, today and for the future.</li></ul>	<b>Pupils should be taught to work scientifically. They will:</b> <ul style="list-style-type: none"><li>ask simple questions and recognising that they can be answered in different ways</li><li>observe closely, using simple equipment</li><li>perform simple tests</li><li>identify and classifying</li><li>use their observations and ideas to suggest answers to questions</li><li>gather and record data to help in answering questions.</li></ul> <b>Pupils should be taught about investigating plants</b> <ul style="list-style-type: none"><li>observe and describe how seeds and bulbs grow into mature plants</li><li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li></ul>
<b>Expectations</b> Children can: <ul style="list-style-type: none"><li>observe and describe how seeds and bulbs grow into mature plants</li><li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li><li>ask simple questions and recognising that they can be answered in different ways</li><li>observe closely, using simple equipment</li><li>perform simple tests</li><li>identify and classifying</li><li>use their observations and ideas to suggest answers to questions</li><li>gather and record data to help in answering questions.</li></ul>	

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Learning Objectives	Suggested Learning Opportunities
<ul style="list-style-type: none"> <li>• To describe the parts and functions of a plant using key vocabulary</li> <li>• To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</li> <li>• To describe the basic conditions that plants need to survive.</li> <li>• To use sources of information to draw scientific conclusions about plants.</li> </ul>	<p><b>Exploration – Plants!</b></p> <p>Present the children with an arrangement of different plants for them to investigate and observe in terms of their functions. Ask the children to use magnify lenses and their observational skills, to dissect the plants and identify the parts and functions of plants.</p> <p>Remind children of their work done about plants in Year 1. Revise the basic structure of some common plants, including trees. List the words children suggest.</p> <ul style="list-style-type: none"> <li>• What did they find out about plants? What do we already know about plants? Return to this at the end of the strand to add the new things children have learnt/discovered.</li> </ul> <p>Point out to children that plants are living things like animals including humans. Rehearse/discuss living and non-living (link to living things and their habitats – Year 2) and the differences and similarities between plants and animals.</p> <ul style="list-style-type: none"> <li>• How do we know plants are alive? Do plants grow? Can plants move?</li> </ul> <p>Children may not realise plants move as they respond to light and gravity as they grow. Can they breathe (respire)? All living things use oxygen and although you cannot see plants taking in air it is happening.</p> <p>Do plants make new little plants? Plants produce seeds or spores or send out runners (above and underground) to make new plants, cuttings can also be taken.</p> <ul style="list-style-type: none"> <li>• Can plants see, hear, feel, taste and smell?</li> </ul> <p>Plants are sensitive to light and some plants wind round a support when they touch it.</p> <p>Do plants need water? Do plants need food? How do we know? How can we find out?</p>

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Give the children sources to investigate to lead their own scientific enquires. Share that plants make their own food (in their leaves) and also absorb water and some nutrients from the soil through their roots.

Record their finding in annotated drawing of a plant and labelling parts and functions with scientific vocabulary or using ICT to present an informative leaflet about plants and what they need to grow.

Useful link: <http://www.bbc.co.uk/education/subjects/z6svr82>

## Manor Primary School

### Science Year 2: Investigating Whodunit! (The Three Little Pigs!)

#### Overview of the Learning:

In this unit of learning children will carry out a range of investigations around a crime scene. All of the learning is around developing their investigation skills and deepens their knowledge, understanding and thinking some of the knowledge & understanding covered across their learning in from year 1 & 2.

#### 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:

- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions.

#### Pupils should be taught

- a. observe and explore to generate ideas, define problems and pose questions in order to develop investigations and products
- b. engage safely in practical investigations and experiments and gather and record evidence by observation and measurement

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- c. apply practical skills to design, make and improve products taking account of users and purposes
- d. communicate and model in order to explain and develop ideas, share findings and conclusions
- e. to continually make systematic evaluations when designing and making, to bring about improvements in processes and outcomes

### Expectations

Children can:

- f. observe and explore to generate ideas, define problems and pose questions in order to develop investigations and products
- g. engage safely in practical investigations and experiments and gather and record evidence by observation and measurement
- h. apply practical skills to design, make and improve products taking account of users and purposes
- i. communicate and model in order to explain and develop ideas, share findings and conclusions
- j. to continually make systematic evaluations when designing and making, to bring about improvements in processes and outcomes

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# Manor Primary School

## Science Year 2: Investigating Living things in their habitats

### Overview of the Learning:

In this unit children will explain differences between things that are living and things that have never been alive. Investigate what living organisms need to stay alive and healthy. Identify and sort living and non-living things and discuss how some non-living things were alive once.

### 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:

- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions.

### Pupils should be taught about living things and their habitats

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including micro-habitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

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- Describe how all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter).
- raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rain-forest.
- work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.

### Expectations

Children can:

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including micro-habitats

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- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
- Describe how all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter).
- raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.
- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
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