

# Science End Point

## EARLY YEARS FOUNDATION STAGE



### Early Years Foundation Stage Statements

The most relevant statements for science are taken from the following areas of learning: Communication and Language, Personal, Social and Emotional Development and Understanding the World

|                     |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reception           | Communication and Language                 | <ul style="list-style-type: none"> <li>• Learn new vocabulary.</li> <li>• Ask questions to find out more and to check what has been said to them.</li> <li>• Articulate their ideas and thoughts in well-formed sentences.</li> <li>• Describe events in some detail.</li> <li>• Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.</li> <li>• Use new vocabulary in different contexts.</li> </ul> |
| Reception Continued | Personal, Social and Emotional Development | <ul style="list-style-type: none"> <li>• Know and talk about the different factors that support their overall health and wellbeing:                             <ul style="list-style-type: none"> <li>- regular physical activity</li> <li>- healthy eating</li> <li>- toothbrushing</li> <li>- sensible amounts of 'screen time'</li> <li>- having a good sleep routine</li> <li>- being a safe pedestrian</li> </ul> </li> </ul>                                                 |
|                     | Understanding the World                    | <ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel while they are outside.</li> <li>• Recognise some environments that are different to the one in which they live.</li> <li>• Understand the effect of changing seasons on the natural world around them.</li> </ul>                                                                                                                                 |

### What a scientist at Mytham is like at this stage

- Make comments about what they have heard and ask questions to clarify their understanding.
- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons

# Science End Point

END OF KEY STAGE 1



## National Curriculum Objectives for KS1

### Working Scientifically

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests
- Identify and classify
- Use observations and ideas to suggest answers to questions.
- Gather and record data to help answer questions.

### What a scientist at Mytham is like at this stage

- Explore the world around them and raise their own questions.
- Have experience of different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions.
- Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships.
- Ask people questions and use simple secondary sources to find answers.
- Use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out.
- With help, record and communicate their findings in a range of ways using simple scientific language.

# Science End Point

END OF KEY STAGE 1



## National Curriculum Objectives for KS1

### Plants

- Identify and name a variety of common and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of a variety of common flowering plants including trees.
- Observe and describe how seeds and bulbs grow into mature plants
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy



### What a scientist at Mytham is like at this stage

- Can name trees / other plants that they see regularly
- Can describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom
- Can point out trees which lost their leaves and those that kept them the whole year
- Can point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green
- Can describe how plants that they have grown from seeds and bulbs have developed over time
- Can identify plants that grew well in different conditions

# Science End Point

E N D O F K E Y S T A G E 1



## National Curriculum Objectives for KS1

### Everyday materials

- Distinguish between an object and the material it is made out of.
- Identify and name a variety of everyday materials ( wood, plastic, glass, metal, water, rock, brick, paper and cardboard ) and compare their suitability for particular uses
- Describe the simple properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

## What a scientist at Mytham is like at this stage

- Can label a picture or diagram of an object made from different materials
- Can describe the properties of different materials
- Can name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use
- Can label a picture or diagram of an object made from different materials
- For a given object can identify what properties a suitable material needs to have
- Whilst changing the shape of an object can describe the action used
- Can use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot
- Can recognise that a material may come in different forms which have different properties

# Science End Point

END OF KEY STAGE 1



## National Curriculum Objectives for KS1

### Animals, including humans

- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- Identify and name a variety of common animals that are carnivores, herbivores and omnivores
- Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)
- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense
- Notice 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



## What a scientist at Mytham is like at this stage

- Can name a range of animals which includes animals from each of the vertebrate groups
- Can describe the key features of these named animals
- Can label key features on a picture/diagram
- Can write descriptively about an animal
- Can write a What am I? riddle about an animal
- Can describe what a range of animals eat
- Can label parts of the body on pictures and diagrams
- Can explore objects using different senses
- Can describe how animals including humans have offspring which grow into adults, using the appropriate names for the stages
- Can state the basic needs of animals, including humans, for survival.
- Can state the importance for humans of exercise, eating the right amounts of different types of food and hygiene.
- Can name foods in each section of the Eatwell guide

# Science End Point

E N D O F K E Y S T A G E 1



## National Curriculum Objectives for KS1

### Seasonal changes

- Observe changes across the 4 seasons
- Observe and describe weather associated with the seasons and how day length varies



### What a scientist at Mytham is like at this stage

- Can name the four seasons and identify when in the year they occur.
- Can describe weather in different seasons over a year.
- Can describe days as being longer (in time) in the summer and shorter in the winter.
- Can describe other features that change through the year .

# End Point

E N D O F K E Y S T A G E 1



## National Curriculum Objectives for KS1

### 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 microhabitats
- 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.



### What a scientist at Mytham is like at this stage

- Can find a range of items outside that are living, dead and never lived
- Can name a range of animals and plants that live in a habitat and micro-habitats that they have studied
- Can talk about how the features of these animals and plants make them suitable to the habitat
- Can talk about what the animals eat in a habitat and how the plants provide shelter for them
- Can construct a food chain that starts with a plant and has the arrows pointing in the correct direction .

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2

### Working scientifically

- 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

## What a scientist at Mytham is like at this stage

- Can use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.
- Can use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.
- Can make their own decisions about what observations to make, what measurements to use / how long to make them for/ whether to repeat them
- Can choose the most appropriate equipment to make measurements and explain how to use it accurately.
- Can decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas.
- Can use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2 Plants

- 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

## What a scientist at Mytham is like at this stage

- Can explain the function of the parts of a flowering plant
- Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination
- Can give different methods of pollination and seed dispersal, including examples

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2

### Animals, including humans

- 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
- Describe the simple functions of the basic parts of the digestive system in humans
- Identify the different types of teeth in humans and their simple functions
- Construct and interpret a variety of food chains, identifying producers, predators and prey
- Describe the changes as humans develop to old age
- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- Describe the ways in which nutrients and water are transported within animals, including humans



### What a scientist at Mytham is like at this stage

- Can name the nutrients found in food
- Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients
- Can name some bones that make up their skeleton giving examples that support, help them move or provide protection
- Can describe how muscles and joints help them to move
- Can sequence the main parts of the digestive system
- Can draw the main parts of the digestive system onto a human outline
- Can describe what happens in each part of the digestive system
- Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for
- Can name producers, predators and prey within a habitat
- Can construct food chains
- Can explain the changes that takes place in boys and girls during puberty
- Can explain how a baby changes physically as it grows and also what it is able to do

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2 Rocks

- 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



## What a scientist at Mytham is like at this stage

- Can name some types of rock and give physical features of each
- Can explain how a fossil is formed
- Can explain that soils are made from rocks and also contain living/dead matter

# Science End Point

E N D O F K E Y S T A G E 2



## National Curriculum Objectives for KS2

### Light

- 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 change
- Recognise that light appears to travel in straight lines
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.



### What a scientist at Mytham is like at this stage

- Can describe how we see objects in light and can describe dark as the absence of light
- Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses
- Can define transparent, translucent and opaque
- Can describe how shadows are formed by objects blocking light.
- Can describe with diagrams or models as appropriate how light travels in straight lines either from sources or reflected from other objects into our eyes.
- Can describe with diagrams or models as appropriate how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape.

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2 Forces (including magnets)

- Compare how things move on different surfaces
- Notice that some forces need contact between 2 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 2 poles
- Predict whether 2 magnets will attract or repel each other, depending on which poles are facing
- 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

## What a scientist at Mytham is like at this stage

- Can give examples of forces in everyday life
- Can give examples of objects moving differently on different surfaces
- Can name a range of types of magnets and show how the poles attract and repel
- Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets
- Can demonstrate the effect of gravity acting on an unsupported object
- Can give examples of friction, water resistance and air resistance
- Can give examples of when it is beneficial to have high or low friction, water resistance and air resistance
- Can demonstrate how pulleys, levers and gears work

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2

### Living things and their habitats

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living things
- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Describe the life process of reproduction in some plants and animals
- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- Give reasons for classifying plants and animals based on specific characteristics

### What a scientist at Mytham is like at this stage

- Can name living things living in a range of habitats, giving the key features that helped them to identify them
- Can give examples of how an environment may change both naturally and due to human impact
- Can draw the life cycle of a range of animals identifying similarities and differences between the life cycles
- Can explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways
- Can give examples of animals in the five vertebrate groups and some of the invertebrate groups
- Can give the key characteristics of the five vertebrate groups and some invertebrate groups
- Can compare the characteristics of animals in different groups
- Can give examples of flowering and non-flowering plants

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2

### States of matter/properties of materials

- Compare and group materials together, according to whether they are solids, liquids or gases
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
- 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



### What a scientist at Mytham is like at this stage

- Can name properties of solids, liquids and gases
- Can give everyday examples of melting and freezing
- Can give everyday examples of evaporation and condensation
- Can describe the water cycle
- Can use understanding of properties to explain everyday uses of materials. For example, how bricks, wood, glass and metals are used in buildings
- Can explain what dissolving means, giving examples
- Can name equipment used for filtering and sieving
- Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving
- Can describe some simple reversible and non-reversible changes to materials, giving examples

# Science End Point

E N D O F K E Y S T A G E 2



## National Curriculum Objectives for KS2

### Sound

- Identify how sounds are made, associating some of them with something vibrating
- Recognise that vibrations from sounds travel through a medium to the ear
- 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
- Recognise that sounds get fainter as the distance from the sound source increases



### What a scientist at Mytham is like at this stage

- Can name sound sources and state that sounds are produced by the vibration of the object.
- Can state that sounds travel through different mediums such as air, water, metal
- Can give examples to demonstrate how the pitch of a sound are linked to the features of the object that produced it
- Can give examples of how to change the volume of a sound e.g. increase the size of vibrations by hitting or blowing harder
- Can give examples to demonstrate that sounds get fainter as the distance from the sound source increases

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2

### Electricity

- Identify common appliances that run on electricity
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators, and associate metals with being good conductors
- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- Use recognised symbols when representing a simple circuit in a diagram



### What a scientist at Mytham is like at this stage

- Can name the components in a circuit
- Can make electric circuits
- Can control a circuit using a switch
- Can name some metals that are conductors
- Can name materials that are insulators
- Can make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs can be changed by increasing or decreasing the number of cells or using cells of different voltages
- Can draw circuit diagrams of a range of simple series circuits using recognised symbols

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2 Evolution and Inheritance

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution



### What a scientist at Mytham is like at this stage

- Can explain the process of evolution
- Can give examples of how plants and animals are suited to an environment
- Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth
- Can give examples of living things that lived millions of years ago and the fossil evidence we have to support this
- Can give examples of fossil evidence that can be used to support the theory of evolution

# Science End Point

END OF KEY STAGE 2



## National Curriculum Objectives for KS2 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



## What a scientist at Mytham is like at this stage

- Can show using diagrams the movement of the Earth and Moon
- Can explain the movement of the Earth and Moon
- Can show using diagrams the rotation of the Earth and how this causes day and night
- Can explain what causes day and night