

Attainment Targets and Level Descriptions for Science and Technology

2

KEY STAGE

Science and technology at Key Stage 1 has two attainment targets which relate directly to sections of the programme of study.

- Investigating and Making in Science and Technology;
- Knowledge and Understanding of Science and Technology.

INVESTIGATING AND MAKING IN SCIENCE AND TECHNOLOGY

Pupils should develop the skills that allow them to explore the world of science and technology. This work should take place in the context of activities that encourage their abilities to plan, make, carry out investigations, interpret results and communicate their findings in a variety of ways.

LEVEL 1

Pupils observe familiar objects, materials and living things, and communicate their ideas about them. They talk about what they are going to make. They assemble and rearrange materials in simple constructions and talk about what they have made.

LEVEL 2

Pupils observe and compare familiar objects, materials and living things. They ask questions related to their observations, predict what might happen and make a simple record of their observations and conclusions. They suggest ideas for making things and join materials in a variety of ways. They incorporate with assistance, movement into their constructions and talk about what they like or dislike about what they have made.

LEVEL 3

Pupils suggest how ideas can be investigated and make predictions about what might happen. They use appropriate instruments to make measurements. They know when a test is fair and recognise why it is fair. They provide simple reasoned explanations for observations and measurements and record these in a variety of ways, *such as writing, or using drawings or bar charts*. They describe in sequence what they did and begin to identify patterns which emerge from their observations. They select and construct using a range of materials, components and construction kits. They explain their choice of materials and components, describe the success of what they have made and suggest improvements.

LEVEL 4

Pupils carry out a fair test indicating factors which need to be kept constant. They make predictions about what they think will happen. They select and use appropriate apparatus and equipment to make a series of observations and measurements. They record and present their findings choosing appropriate methods *such as diagrams, simple tables, graphs or a written record*. They use results to draw conclusions related to their knowledge and understanding. They use their knowledge of the properties of materials to plan and construct and use with competence, appropriate tools and techniques to cut, shape and join materials. They evaluate what they have made, bearing in mind their original intentions.

KNOWLEDGE AND UNDERSTANDING OF SCIENCE AND TECHNOLOGY

Pupils should take part in activities which develop their knowledge and understanding of:

- living things in the local environment;
- the properties of materials, of objects made from them and the way changes can effect materials;
- forces and energy, simple circuits and sources of sound and light.

Living Things

LEVEL 1

Pupils talk about a variety of living things and sort them into animals and plants. They recognise and name external parts of the body, using words *such as head or arm*, and of plants, using words *such as leaf or flower*.

LEVEL 2

Pupils sort living things into groups using observable features such as number of legs or shape of leaf. They describe similarities and differences between themselves and others. They sequence the basic stages of human development and know what is required to keep healthy and safe.

LEVEL 3

Pupils use their knowledge of basic life processes such as growing, feeding, moving or using their senses to describe similarities and differences between living things. They provide simple explanations for changes affecting animal and plant behaviour *such as seasonal changes or the use of colour in camouflage*.

LEVEL 4

Pupils, through first hand experiences and using a range of resources, identify and classify locally occurring species of animals and plants using observable features. They relate them to the location in which they were found and describe the conditions necessary for their growth. They sequence the main stages of a life cycle *such as that of a butterfly or a flowering plant*. They name the major organs of the human body, *such as brain, heart or lungs*, and identify the position of these organs in the human body. They know the conditions necessary to keep healthy.

Materials

LEVEL 1

Pupils talk about everyday materials *such as paper, plasticine or sand*, and sort everyday objects into groups *such as paper, plastic or wood*.

LEVEL 2

Pupils sort objects or materials into groups giving reasons for their choice of groupings using everyday terms *such as hard, smooth or shiny*. They describe what happens when some everyday substances *such as chocolate or jelly* are heated or cooled.

LEVEL 3

Pupils describe similarities and differences between materials and sort them according to their properties. They know that some everyday substances, *such as sugar or salt*, will dissolve in water. They know that there is a wide range of waste products and that materials *such as wood* decay naturally while others *such as plastics* do not.

LEVEL 4

Pupils use their knowledge and understanding of the properties of a range of materials to suggest why certain materials are suitable for specific purposes. They describe the changes of state in heating and cooling water. They know that products made from paper, glass or aluminium can be recycled.

Physical Processes

LEVEL 1

Pupils talk about some appliances in the classroom and at home which use electricity, *such as a television or a kettle*. They identify in their immediate environment a variety of sound sources, *such as a dog barking or footsteps*, and light sources, *such as the sun or a light bulb*.

LEVEL 2

Pupils describe what happens when objects are pushed and pulled, using terms *such as 'speeds up' or 'stops'*. They describe how to make different sounds with a variety of objects. They know that some colours are more easily seen in the dark.

LEVEL 3

Pupils know that there are different sources of energy *such as oil, gas or coal*. They outline the dangers of the misuse of mains electricity and know how to use electrical appliances safely. They explain that sounds are produced by vibrations. They know that light does not pass through all materials.

LEVEL 4

Pupils describe how forces can affect the movement and shape of objects. They identify a range of energy sources, *such as a battery for a torch*. They describe how to construct simple circuits using terms *such as switches, bulbs or batteries* and identify materials as to whether they are insulators or conductors. They know how shadows are formed.

INVESTIGATING AND MAKING IN SCIENCE AND TECHNOLOGY

Pupils should develop the skills that allow them to explore the world of science and technology. This work should take place in the context of activities that encourage their abilities to plan, make, carry out investigations, interpret results and communicate their findings in a variety of ways.

LEVEL 5

Pupils plan, carry out and explain the working of a fair test which is designed to answer a question that has arisen from their work in science and technology. They select a range of simple apparatus appropriate to the task and use it with precision and safety. They record results systematically and use their results to draw conclusions, identify patterns or make comparisons. They begin to explain their results and make written statements about patterns or conclusions derived from these results. Their conclusions, which they relate to scientific knowledge and understanding are consistent with the evidence obtained. They control the movement of a model they have made and test it in terms of reliability and strength.

KNOWLEDGE AND UNDERSTANDING OF SCIENCE AND TECHNOLOGY

Pupils should take part in activities which develop their knowledge and understanding of:

- living things in the local environment;
- the properties of materials, of objects made from them and the way changes can effect materials;
- forces and energy, simple circuits and sources of sound and light.

Living Things

LEVEL 5

Pupils describe the relationship between basic life processes *such as circulation, simple respiration and digestion* in maintaining healthy bodies. They know why humans have skeletons and muscles. They order living things in a simple food chain.

Materials

LEVEL 5

Pupils know the distinctive properties of solids, liquids and gases as exemplified by water. They relate changes of state to the water cycle. They understand that when new materials are formed, the change is permanent. They know how rusting can be controlled.

Physical Processes

LEVEL 5

Pupils describe the effect of friction on moving objects. They know the differences between renewable and non renewable energy resources and the need for fuel economy. They describe the effect of varying current in a circuit to make bulbs brighter or dimmer. They describe what happens when light is reflected from mirrors and other shiny surfaces.