

Science

Stage One

Students encounter activities and experiences. Any participation is fully prompted. They may be passive or resistant. They may show simple reflex responses. Students show emerging awareness of activities and experiences. They may have periods when they appear alert and ready to focus their attention. They may give intermittent reactions.

Science Knowledge & Understanding

Students:

- experience a variety of living and non living materials
- experience changes in everyday materials using their senses
- occasionally give attention to activities

Stage Two

Students begin to respond consistently to familiar people, events and objects. They react to new activities and experiences. They begin to show interest in people, events and objects. They accept and engage in coactive exploration. Students begin to be proactive in their interactions. They communicate consistent preferences and affective responses. They recognize familiar people, events and objects. They perform actions, often by trial and improvement, and they remember learned responses over short periods of time.

Science Knowledge & Understanding

Students:

- attend and respond to a variety of sounds
- attend and respond to variations to temperature
- attend and respond to variations in light
- respond to the touch, taste, smell of everyday materials
- respond to the different attributes of a variety of objects and life forms

Science at Work

Students:

- tolerate the use of a variety of appliances, both electrical and hand powered
- attend to the use of appliances

Stage Three

Students begin to communicate intentionally. They seek attention through eye contact, gesture or action. They participate in shared activities with less support. They sustain concentration for short periods. They explore materials in increasingly complex ways. They remember learned responses over more extended periods. Students greet known people and may initiate interactions. They can remember learned responses over increasing periods of time and may anticipate known events. They may respond to options and choices with actions and gestures. They actively explore objects and events for more extended periods.

Science Knowledge & Understanding

Students may:

- explore and manipulate light sources
- explore sounds and manipulate materials to create sounds
- explore the effects of temperature changes
- make prolonged tactile / visual investigation of living things
- make prolonged tactile / visual investigation of non living things
- through manipulation develop understanding that actions have consequences e.g. push toy car

Science at Work

Students may:

- intentionally use switches to operate electrical items with easily observable outcomes
- initiate action to achieve anticipated outcome e.g. pushing ball down a slope

Stage FourScience Knowledge & Understanding

Students explore objects and materials, changing some materials by physical means and observing the outcomes.

Students:

- know that certain actions produce predictable results e.g. sponges can be squeezed to get water
- deliberately change materials by physical means and observe the outcomes e.g. mixing sand and water
- intentionally squeeze / roll materials such as play dough
- manipulate pliable materials to change their shape
- handle and observe living things with interest e.g. farm visit
- demonstrate an awareness of changes in light, sound and movement

Science at Work

Students show interest in a wide range of living things, handling and observing them.

Students:

- intentionally cause movement through pushing and pulling e.g. string toy, car
- apply science knowledge and understanding to create simple products e.g. jelly, ice block

Stage Five

Students anticipate and join in activities focused on enquiry into specific environments. They group objects and materials in terms of simple features or properties. They can indicate the before and after of material changes. They engage in experimentation with a range of equipment in familiar and relevant situations. They answer simple scientific questions.

Science Knowledge & Understanding

Students:

- identify what they expect to see and talk about what they have seen e.g. at Old MacDonald's Farm visit
- explore how sounds can be created and changed
- observe changes in the environment through the seasons

- answer simple scientific questions e.g. 'where does the fish live?'
- identify differences e.g. 'is the drink hot or cold?'
- sort objects and materials according to simple properties (plants / animals; float / sink)
- show awareness that some processes change the properties of materials e.g. heating food

Science at work

Students:

- investigate appropriate materials and tools for a specific task e.g. make musical instruments from recycled materials
- observe and document growing plants
- explore different power sources e.g. kite, balloon powered car, wind up toys, push cars
- use a torch to locate an object in a darkened room

Stage Six

Students explore objects and materials provided in an appropriate way. They recognise features of objects. They begin to make generalisations, connections and predictions from regular experience. They consistently sort materials according to given criteria when the contrast is obvious. They closely observe changes in materials. Students increase their awareness of sources of power, light and sound.

Science Knowledge & Understanding

Students:

- identify the features of living things in their environment e.g. parts of the body, parts of plant
- identify where features belong e.g. eyes on a face, leaves on a tree
- participate in simple experiments
- make generalisations or predictions e.g. ice cream melts, wheeled objects move faster if pushed down a slope
- continue to develop their classification skills using specified criteria
- observe changes to materials when they are heated, cooled or mixed
- become aware that some changes can be reversed e.g. melting chocolate
- identify some appliances that use electricity
- recall and locate sources of sound and light
- develop a basic scientific vocabulary e.g. solids / liquids
- examine change over time e.g. life cycles

Science at work

Students:

- identify the appropriate power source to achieve a desired outcome e.g. batteries for a toy
- begin to develop an understanding of how machines work by taking apart and reassembling

Stage Seven

Students actively join in scientific investigations. They understand some simple scientific vocabulary and can communicate related ideas and observations using simple phrases. They sort materials reliably with given criteria.

Students observe some of the simple properties of light, sound and movement. They begin to record their findings. They begin to make suggestions for planning and evaluating.

Science Knowledge & Understanding

Students:

- understand some scientific vocabulary e.g. same, different, before and after, light and dark, hard and soft
- make simple predictions and with support test them e.g. make popcorn
- sequence pictures of babies, children, teenagers, adults and older people
- sequence the life cycle of a plant or animal using photos
- sort materials reliably according to given criteria e.g. hard or soft, smooth or rough
- understand the relationship between light and shadows, sound and volume, movement and speed
- describe different kinds of weather and the ways in which people adapt to the weather e.g. heat house in winter

Science at Work

Students:

- apply knowledge of living things e.g. to grow a plant
- apply knowledge of different power sources e.g. to create a model with movable parts

Stage Eight

Students explore and observe similarities, differences, patterns and changes in features of objects and events. They begin to make their own contributions to planning, evaluation and to recording their findings in different ways.

Science Knowledge & Understanding

Students:

- identify a range of common materials and know about some of their properties glass / hard, breakable, wood / floats
- sort objects by criteria of their properties e.g. hard objects, rough, breakable, flexible
- manipulate and observe similarities and differences in a range of like objects e.g. all plastic, all plates, all paper
- manipulate and observe similarities and differences in a range of like events e.g. pushing a variety of objects up a slide, pulling a variety of objects along a path, squeezing a variety of objects made from different materials etc
- describe changes to speed in response to simple question e.g. 'What's happened to the car?' (When surface slope changed). It went faster. It stopped.
- describe changes to movement when different surfaces are used e.g. pull toy through water, along rough surface, etc
- make own observations of changes in movement that result from actions e.g. roll car down gentle slope, then increase slope and observe change in speed.
- recognise forces that attract or repel
- identify energy sources used by familiar tools or toys
- identify life processes of living things e.g. growth, digestion, interaction with the environment
- know that living things are made of parts that have specific functions

- describe some difference between living and non living things e.g. animals grow and need water, food and sun, whereas rocks do not
- identify patterns and cycles in the natural world e.g. life cycle of frog, petals on flower
- know that some organisms have similar external characteristics and that the similarities and differences relate to environmental habitat

Science at Work

Students:

- ask questions about and identify some needs of living things, and explore possible answers to these questions and ways of meeting these needs e.g. predict how an animal will move on the basis of two or more observed characteristics
- apply knowledge of natural patterns to predict next occurrences and plan e.g. seasons, cycle of plant growth life cycles of frogs.

Stage Nine

Students investigate the characteristics and needs of animals and plants. They identify and describe the properties of materials and describe the function of specific materials in everyday life. They demonstrate an understanding of ways in which energy is used in daily life. Students demonstrate an understanding of changes that occur in daily and seasonal cycles and of how these changes affect the characteristics, behaviour and location of living things.

Science Knowledge and Understanding

Students:

- describe some natural occurrences using their own observations e.g. sprouting seeds
- select and use appropriate tools to increase their capacity to observe e.g. magnifying glass, stethoscope
- describe patterns that they have observed in living things e.g. pine cones
- describe different uses of energy at home, school and in the community
- investigate changes that occur in a daily cycle and in a seasonal cycle
- describe how living things adapt to and prepare for daily and seasonal changes
- record relevant observations, findings and measurements using written language, drawings, photos, charts and concrete materials
- describe the different ways animals move to meet their needs
- describe some basic changes in humans as they grow and compare changes in humans with changes to other living things
- compare ways in which humans and other animals use their senses to meet their needs

Science at Work

Students:

- ask questions about, and identify needs and problems related to energy production and explore possible solutions e.g. what to do when power fails
- describe changes in the characteristics, behaviour and location of living things that occur in seasonal cycles
- ask questions about and identify problems related to materials and explore possible answers and solutions e.g. test different fabrics to determine which are water-proof

Stage Ten

Students respond to suggestions about how to find things out and with help, make their own suggestions about how to collect data to answer questions. They use simple texts, with help, to find information. They use simple equipment provided and make observations related to their task. They observe and compare objects, living things and events. They describe their observations using scientific vocabulary and record them, using simple tables when appropriate. They say whether what happened was what they expected.

Science Knowledge & Understanding

Students:

- describe various materials using information gathered from senses
- demonstrate understanding of how our senses help us recognize and use a variety of materials e.g. sense of smell if milk is fresh, hearing if machine is working
- compare the movement of different objects in terms of speed and direction
- know that forces can make objects stop, slow down, speed up, change direction and change shape
- predict ways in which materials can be changed and the tools needed e.g. by cutting, joining
- identify reversible and irreversible changes in materials
- demonstrate an understanding of the similarities and differences among various types of animals and the ways in which animals adapt to different environmental conditions.
- predict and describe how weather conditions affect living things including themselves e.g. effect of wind on trees in autumn, extreme weather on activities

Science at Work

Students:

- use knowledge of matter and materials to making useful objects
- use knowledge and understanding of movement to create e.g. toys with different moving parts
- identify features of a day and / or night sky and relate to patterns of behaviour in everyday life