

Summary of students' performance by the end of Grade 1

Scientific enquiry

Students recognise the importance of using all their senses when collecting evidence. They use both experience and information to answer questions. They sort objects into groups according to common characteristics. They represent the data pictorially. They use descriptive words when making observations. They ask questions about the objects and know and use words that describe what things feel, look and sound like, and the names of objects they have observed. They know words and phrases related to safety. They follow simple instructions safely.

Life science

Students describe how the appearance of some organisms changes over time. They recognise and respect a variety of different places where organisms live. They know some of the ways in which living and non-living things differ. They know that animals need air and food and water and that green plants need water and sunlight.

Materials

Students name some common materials and describe how use them. They use descriptive words to describe the important characteristics of common materials and classify objects according to the material from which they are made. They classify common materials according to shared characteristics.

Physical processes

Students recognise that things move in different ways. They observe and compare different movements and describe what causes different things to move. They know that pushes and pulls start and stop things moving, and that some moving objects can be dangerous. They know that we use our senses to detect heat, light and sound, and that light is needed for us to see things. They know that we see things with our eyes, hear things with our ears and feel things with our skin. They use words that describe what things feel, look and sound like. They name light sources and sound sources. They make observations and simple measurements related to heat, sound and light and represent them in picture charts.

The balance between scientific enquiry and the subject content strands

The science standards for Grade 1 are grouped into four strands: three content strands – life science, materials and physical processes – and the scientific enquiry skills strand, which addresses the development of scientific practical and intellectual skills across all the content strands.

The teaching of the content standards in life science, materials and physical processes should take approximately half the total time allocated to science in Grade 1. It is intended that the remaining time is devoted to developing further science enquiry skills and the language, mathematical and communication skills that are important for science. This may be done

using *any* science content topics, not just the content topics prescribed in these standards.

Assessment weightings for Grade 1

There are three general assessment objectives for the science curriculum:

- knowledge and understanding;
- application of knowledge and understanding, analysis and evaluation of information;
- scientific enquiry skills and procedures.

The balance between these three general objectives will vary from grade to grade. As students' scientific proficiency and experience develops, there should be a greater emphasis on the application of knowledge to solve problems in new situations.

For Grade 1, the weightings of the subject content strands are as follows:

	Life science	Materials	Physical processes
Assessment weighting	30 to 40%	30 to 40%	30 to 40%

For Grade 1, the weightings of the assessment objectives to be applied to each content strand are as follows:

	Knowledge and understanding	Application, analysis and evaluation	Scientific enquiry skills and procedures
Assessment weighting	20 to 30%	0 to 10%	65 to 75%

Scientific enquiry

By the end of Grade 1, students recognise the importance of using all their senses when collecting evidence. They use both experience and information to answer questions. They sort objects into groups according to common characteristics. They represent the data pictorially. They use descriptive words when making observations. They ask questions about the objects and know and use words that describe what things feel, look and sound like, and the names of objects they have observed. They know words and phrases related to safety. They follow simple instructions safely.

Students should:

1 Use methods of scientific investigation

- 1.1 Use all their senses to collect evidence.
- 1.2 Use both experience and information to answer questions.
- 1.3 Make regularly changing collections of objects of scientific interest from the local environment.

Make thematic collections of objects of natural or of human origin (e.g. rock samples, metallic objects, manufactured objects, objects made from wood, seashells, photographs of plants and animals).

Collect seashells during a visit to the coast. Display them. Identify common species and label them.

Make a collection of pictures of native animals and plants. Identify these and label them.

Take photographs of an area with plants at different seasons of the year and display these with the date taken.

Make a collection of metal objects and label them, naming both the metals and the objects. Use adjectives such as shiny, dull, bright, sharp, cold to describe the metal.

Make a collection of different magnets. Use them to test metals in the metal collection to classify them as magnetic or non-magnetic.

Make a collection of glass objects and label them, naming the objects and stating what they are used for.

2 Process and communicate information

- 2.1 Classify objects into groups according to common characteristics.
- 2.2 Use pictorial means to record observations and data collected.
- 2.3 Create a display using collected information.

Key standards

Key performance standards are shown in shaded rectangles, e.g. 1.3.

Examples of learning exercises

The examples of active learning exercises shown in italics are intended to be illustrative and do not represent the full range of possible exercises.

Cross-references to scientific enquiry skills

Some of the suggested learning exercises are cross-referenced where appropriate to scientific enquiry skills.

- 2.4 Undertake project work on a particular topic. This should involve obtaining primary and secondary information, and carrying out oral work and, where appropriate, drawing, writing and number work.

Use a collection of shells to make a booklet about the shells collected. These can be sketched and labelled, and the numbers of each kind collected can be indicated.

Collect photographs of different animals (including not only mammals but fish, amphibians, reptiles, birds, spiders and insects) from magazines. Group them according to common characteristics (e.g. whether they are furry, how many legs or wings they have).

- 2.5 Describe how things feel, appear and what they sound like.
- 2.6 Know and use words related to safety.

3 Handle equipment and make measurements

- 3.1 Follow simple oral and visual instructions carefully and safely.

ICT opportunity

Use digital photography to record the collected items for the project.

Life science

By the end of Grade 1, students describe how the appearance of some organisms changes over time. They recognise that organisms live in a variety of different places and show respect for both organisms and the environment. They state some of the ways in which living and non-living things differ. They know that animals use their senses and need air and food and water. They recognise parts of green plants and know that plants need water and sunlight.

Students should:

4 Describe how the appearance of organisms changes over time

- 4.1 Describe how the appearance of some common organisms changes as they age and with the seasons of the year.

Record the appearance of a tree or other plant over a period of time.

Make oral descriptions of people of different ages.

Describe how some common animals (e.g. camels, cats) change as they age.

Enquiry skill 2.5

5 Recognise that organisms live in a variety of places and that habitats are vulnerable

- 5.1 Describe some of the places where some common plants and animals live and know that some of these are easily disturbed.

Tour the school and its environs and describe the different places where animals and plants are found.

Make a display of photographs of animals and plants in their natural surroundings.

Examine photographs of places before and after human intervention and describe the changes in the living organisms present.

Find out about places where animals and plants are being conserved.

Enquiry skills 1.1, 2.1, 2.2, 2.5

6 Know distinguishing characteristics of living things

- 6.1** Know that living organisms need food, water and air, that they are sensitive, and that they grow and reproduce, and that it is these characteristics that distinguish them from non-living things.

Watch videos of animals eating and drinking and discuss observations.

Enquiry skills 2.1, 2.5

Set up, maintain and observe an aquarium.

Match drawings or photographs of adult animals and their young at different stages of growth.

Sort collections of pictures of living and non-living things and talk about their similarities and differences.

- 6.2** Know that that green plants have roots, stems and leaves and need water and light.

Determine what happens to a green plant when it is kept in the dark.

Enquiry skill 2.5

Compare plants that are watered regularly with those that are not.

Examine a plant dug up from a garden.

Make a model plant.

Materials

By the end of Grade 1, students name some common materials and describe how we use them. They use descriptive words to describe the important characteristics of common materials and classify objects according to the material from which they are made. They classify common materials according to shared characteristics.

Students should:

7 Identify and describe a number of common materials

- 7.1** Name a number of common materials and show some of the ways we use them.

Write the name of the material of which an object is made next to a picture of that object (common materials include glass, wood, clay, fabrics, paper, metal, plastic and rubber).

- 7.2** Describe the important physical characteristics of common materials.

Use the senses of sight, smell and touch to help describe the properties of materials.

Enquiry skills 2.1, 2.2, 2.5

Use words to describe materials (e.g. hard, soft, strong, breakable, light, heavy, flexible, rough, smooth, shiny, dull). Record observations by writing descriptions next to pictures of objects, or by sticking pictures of objects that have similarities together in sets.

- 7.3** Classify common objects according to the material from which they are made.

Search the classroom and its environs for common materials being used (e.g. wood, plastic, metals, paper, glass) and note the ways they are used. Make a record of the uses of materials by, for example, drawing the objects grouped according to materials.

Enquiry skills 1.1, 2.1, 2.2

Using a collection of objects made from different materials, select words to describe how the materials look, feel and smell. Group the materials together and stick descriptive words onto the materials.

- 7.4 Show that one material can often be used to make a variety of different objects.

Display different objects made from the same material (such as wood).

Enquiry skill 2.3

Physical processes

By the end of Grade 1, students recognise that things move in different ways. They observe and compare different movements and describe what causes different things to move. They know that pushes and pulls start and stop things moving, and that some moving objects can be dangerous. They know that we use our senses to detect heat, light and sound, and that light is needed for us to see things. They know that we see things with our eyes, hear things with our ears and feel things with our skin. They use words that describe what things feel, look and sound like. They name light sources and sound sources. They make observations and simple measurements related to heat, sound and light and represent them in picture charts.

Students should:

8 Know that objects can be made to move

- 8.1 Recognise that objects move in different ways and use words to describe how they move.

Watch different kinds of movement around the school. List the different ways in which things move.

Enquiry skill 1.1

- 8.2 Observe and compare different movements.

Observe the different ways their friends move. Note which parts of the body move and how they move. Record this on a picture of a person by writing descriptive words next to the part that moves.

Enquiry skill 2.3

- 8.3 Describe what causes different objects to move.

Identify the causes of movement around the school.

Make soap bubbles and describe how they move and what causes them to move.

Make and test something that can be made to move using wind or water. Work on the design to make it move better.

- 8.4 Know that pushes and pulls can start and stop objects moving.

Identify objects in the classroom that can be made to move by pushing or pulling.

Identify some moving objects in the classroom that they can stop easily.

Enquiry skill 3.1

- 8.5 Recognise that moving objects can be dangerous.

Identify moving objects that it would be dangerous to try to stop.

9 Use their senses to tell them about the world around them

- 9.1 Use senses of touch, sight and hearing to detect heat, light and sound.

Identify objects from recordings of the sounds that they make.

Identify objects in a 'black box' by just feeling them.

9.2 Know which organs we use to detect heat, light and sound.

Develop a game using matching-pair cards to link organs with sensations.

Use words and draw pictures to describe what they see, feel and hear.

Enquiry skill 2.5

9.3 Know that light is needed for us to see things.

Develop games based on finding and identifying common objects in dark places, which can be made lighter to make the task easier.

9.4 Know that shiny objects do not make their own light; they need light sources to make them visible.

Carry out tests to show how objects can be made more visible (e.g. shine more lights on objects, attach reflective strips to objects).

Discuss the use of reflective strips to make people and traffic more visible at night.

9.5 Name some common sources of light, sound and heat.

Look around the school for different sources of light.

In the school grounds, find out if they can see the Sun when they stand in the shade.

Classify common sounds using descriptive words such as loud, soft, high, low, pleasant, musical, nasty. Record this by writing the words next to a picture of the sound source.

Investigate how sounds are made by different objects, including musical instruments.

List and draw some of the common sources of heat around the school and home.

Classify them in various ways (e.g. natural or made by people, dangerous or not dangerous).

Enquiry skill 1.1

Safety

Students should not look directly at the Sun.

Enquiry skills 2.1, 2.2, 2.6

9.6 Know that having two ears helps us to identify where a sound is coming from.

With both eyes shut and one ear covered, try to point out where a sound is coming from. Repeat the activity with both ears uncovered.
