

3

Science standards

Summary of students' performance by the end of Kindergarten

Scientific enquiry

Students ask questions about living things and their environment. They develop intuitive ideas about the properties of materials and their environment. They group objects according to common characteristics. They use words and drawings to describe things that they see, hear, smell and touch.

Life science

Students know that different organisms have different body forms, shapes and sizes. They recognise some common animals and plants. They know the names of the external parts of their bodies. They know that keeping clean helps them to stay healthy.

Materials

Students describe common materials and use them to make things; they know that some materials are better than others for this purpose. They make and test structures and know that some structures fall over more easily than others. They know that we can change materials by doing things to them, such as mixing, dissolving, heating, cooking. Students develop intuitive concepts of weight, volume and density of materials.

Physical processes

Students know that we use our eyes to see things and our ears to hear things and that we can discover things about objects by touching them. They know that we can use inventions to enhance our senses. They know that daylight comes from the Sun and that it is dangerous to look at the Sun.

The balance between scientific enquiry and the subject content strands

The science standards for Kindergarten 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 Kindergarten. 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 Kindergarten

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 Kindergarten, 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 Kindergarten, 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 Kindergarten, students ask questions about living things and their environment. They develop intuitive ideas about the properties of materials and their environment. They group objects according to common characteristics. They use words and drawings to describe things that they see, hear, smell and touch.

Students should:

1 Use methods of scientific investigation

- 1.1** Ask questions about objects, living things and the environment.

Play games with roles for common objects such as wind, sea, Sun and Moon.

- 1.2** Use all their senses to develop intuitive ideas about the properties of materials and objects in their environment.

Play with different sizes and shapes of blocks made from a variety of materials.

Describe the relative position of objects by using one reference (e.g. above, below, in front of, behind).

Make collections of different commonly available materials.

Pour water and sand into containers of different shape and size.

- 1.3** Sort objects into groups according to common characteristics.

Make collections of interesting objects. Sort them by chosen criteria. Talk about them, giving them names and naming the criteria (e.g. big, small, heavy, light, smooth, rough, cold, hot).

Count objects. Put in groups of the same number.

2 Process and communicate information

- 2.1** Communicate observations orally and by drawing.

Describe some of the objects in collections.

Describe groups of objects that have been classified according to a specific criterion.

Life science

By the end of Kindergarten, students know that different organisms have different body forms, shapes and sizes. They recognise some common animals and plants. They know the names of the external parts of their bodies. They know that keeping clean helps them to stay healthy.

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.

Students should:

3 Recognise some common animals and plants

- 3.1** Know that different types of organism differ in body shape, form and size and have different names.

Look at pictures and make field observations of animals and plants.

Enquiry skills 1.1, 2.1

Keep an outdoor or indoor garden with a variety of plants.

Make wall displays of common animals and plants.

Listen to stories about animals and plants.

Sing songs, play games and do actions relating to common animals and plants.

4 Know the external parts of their bodies

- 4.1** Know the names of the external parts of their bodies (e.g. head, ears, eyes, legs, toes, arms, hands, fingers).

Play games that involve or name parts of the body.

Enquiry skills 1.1, 2.1

Make models of people.

Act out play situations with dolls.

Identify body parts on charts and pictures.

5 Know that keeping clean is important to good health

- 5.1** Understand that regular washing is an important way to help keep healthy.

Wash hands after activities and before eating.

Materials

By the end of Kindergarten, students describe common materials and use them to make things; they know that some materials are better than others for this purpose. They make and test structures and know that some structures fall over more easily than others. They know that we can change materials by doing things to them, such as mixing, dissolving, heating, cooking. Students develop intuitive concepts of weight, volume and density of materials.

Students should:

6 Use common materials

- 6.1** Use common materials to make and test structures.

Make structures using materials such as bricks, wet and dry sand, and clay, and test them.

Enquiry skill 1.2

- 6.2** Know that objects can be described in terms of the materials they are made from, such as plastic, clay, paper, cloth.

Using real objects or matching games, classify objects according to what they feel like or what they are made out of.

- 6.3** Know that objects can be described in terms of their physical properties, such as colour, size, shape, weight, texture, flexibility, floating, sinking.

Using real objects or teaching materials such as jigsaws, carry out simple classification exercises (e.g. floating/sinking, light/heavy, soft/hard, big/small).

- 6.4** Know that materials can change in different conditions.

Explore the differences between wet and dry sand or clay.

Explore the conditions that cause water to evaporate.

- 6.5** Develop intuitive concepts of weight, volume and density.

Pour sand and water between containers; count how many small containers are needed to fill a larger one.

Classify collections of objects according to how heavy they are and how big they are.

Enquiry skill 1.3

ICT opportunity

Virtual object-matching games.

Enquiry skill 1.1

Enquiry skill 1.2

Enquiry skill 1.3

Physical processes

By the end of Kindergarten, students know that we use our eyes to see things and our ears to hear things and that we can discover things about objects by touching them. They know that we can use inventions to enhance our senses. They know that daylight comes from the Sun and that it is dangerous to look at the Sun.

Students should:

7 Use their senses to make observations

- 7.1** Know that we make observations using all our senses and that we can use inventions to assist us.

Use inventions that assist human senses (e.g. magnifying glass, binoculars, stethoscope).

Explore the use of everyday objects to improve our perceptions (e.g. listening to something through a tin or a stick and using a bottle of water as a magnifying glass).

Play games that focus on only one sense (e.g. identifying objects by touch or smell when blindfolded).

Reflect on objects in the environment that move, particularly the children's own bodies. Use words to describe the different kinds of movement (e.g. bouncing jumping, walking) and different ways of shifting objects (e.g. lift, carry, push, pull).

- 7.2** Know that daylight comes from the Sun and that it is dangerous to look at the Sun.

Play games chasing shadows and making differently shaped shadows. Perform a shadow play.

Enquiry skill 1.2

Enquiry skill 2.1

