

ISPS Science K-12 Standards and Benchmarks

Grade 5

(Revised Sept. 2008)

Strands

1. Earth and Space Sciences
2. Life Sciences
3. Materials and their Properties (not covered at this grade level)
4. Physical Processes
5. Nature of Science

Strand 1 – Earth and Space Sciences

Standard 3 - Students will understand the composition and structure of the universe and the Earth's place in it.

Benchmarks - By the end of Grade 5, students will:

- 3 – 1 Know that the stars are innumerable, unevenly dispersed, and of unequal brightness
- 3 – 2 Know that the patterns of stars in the sky stay the same, although they appear to slowly move from east to west across the sky nightly and different stars can be seen in different seasons
- 3 – 3 Know that astronomical objects in space are massive in size and are separated from one another by vast distances (e.g., many stars are more massive than our Sun but so distant they look like points of light)
- 3 – 4 Know characteristics of the Sun and its position in the universe (e.g., the Sun is a medium-sized star; it is the closest star to Earth; it is the central and largest body in the Solar System; it is located at the edge of a disk-shaped galaxy)
- 3 – 5 Know characteristics and movement patterns of the planets in our Solar System (e.g., planets differ in size, composition, and surface features; planets move around the Sun in elliptical orbits; some planets have moons, rings of particles, and other satellites orbiting them)
- 3– 6 Know that the universe consists of many billions of galaxies (each containing many billions of stars) and those incomprehensible distances (measured in light years) separate these galaxies and stars from one another and from the Earth
- 3 –7 Know that gravitational force keeps planets in orbit around the Sun and moons in orbit around the planets

ISPS Science K-12

Standards and Benchmarks

- 3 –8 Know characteristics and movement patterns of asteroids, comets, and meteors
- 3 –9 Know that the planet Earth and our Solar System appear to be somewhat unique (e.g., the Earth is the only celestial body known to support life), although similar systems might yet be discovered in the universe

Strand 2 – Life Sciences

Standard 6 - Students will understand relationships about organisms and their physical environment

Benchmarks - By the end of Grade 5, students will:

- 6 – 1 Know the organization of simple food chains and food webs (e.g., green plants make their own food with sunlight, water, and air; some animals eat the plants; some animals eat the animals that eat the plants)
- 6 – 2 Know that an organism's patterns of behavior are related to the nature of that organism's environment (e.g., kinds and numbers of other organisms present, availability of food and resources, physical characteristics of the environment)
- 6 – 3 Know that changes in the environment can have different effects on different organisms (e.g., some organisms move in, others move out; some organisms survive and reproduce, others die)
- 6 – 4 Know that all organisms (including humans) cause changes in their environments, and these changes can be beneficial or detrimental

Strand 4 – Physical Processes

Standard 11 -Students will understand the sources and properties of energy.

Benchmarks - By the end of Grade 5, students will:

- 11 – 1 Know that heat is often produced as a byproduct when one form of energy is converted to another form (e.g., when machines and living organisms convert stored energy to motion)

Standard 12 - Students will understand forces and motion

Benchmarks - By the end of Grade 5, students will:

- 12 – 1 Know that the Earth's gravity pulls any object toward it without touching it

ISPS Science K-12 Standards and Benchmarks

Strand 5: The Nature of Science

Standard 15: Ideas and Evidence in Science.

By the end of the course students will understand:

15 – 1 that it is important to collect evidence by making observations and measurements when trying to answer a question.

Standard 16: Investigative Skills

PLANNING

Students will be able to:

16 – 1 ask questions that can be investigated scientifically and decide how to find answers.

16 – 2 consider what sources of information, including first-hand experience and a range of other sources, they will use to answer questions.

16 – 3 think about what might happen or try things out when deciding what to do, what kind of evidence to collect, and what equipment and materials to use.

16 – 4 make a fair test or comparison by changing one factor and observing or measuring the effect while keeping other factors the same.

OBTAINING AND PRESENTING EVIDENCE

Students will be able to:

16 – 5 use simple equipment and materials appropriately and safely.

16 – 6 make systematic observations and measurements.

16 – 7 check observations and measurements by repeating them where appropriate.

16 – 8 use a wide range of methods, including diagrams, drawings, tables, bar graphs and ICT, to communicate data in an appropriate and systematic manner.

Considering evidence and evaluating

Students will be able to:

16 – 9 make comparisons and identify simple patterns or associations in their own observations and measurements or other data.

16 – 10 use observations, measurements or other data to draw conclusions.

16 – 11 decide whether these conclusions agree with any prediction made and/or whether they enable further predictions to be made.

16 – 12 use their scientific knowledge and understanding to explain observations, measurements or other data or conclusions.

16 – 13 review their work and the work of others.

ISPS Science K-12 Standards and Benchmarks