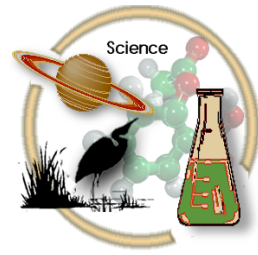


# Science

## Grade 6



### **Standard 1: The student develops effective problem-solving strategies.**

- 1.1 Makes observations, inferences, predictions and estimations
- 1.2 Collects data through a variety of methods
- 1.3 Classifies and organizes data
- 1.4 Takes measurements and converts measurements within and between systems
- 1.5 Communicates observations, research, results and conclusions through a variety of methods and uses appropriate vocabulary

### **Standard 2: The student understands the nature of scientific knowledge and investigations.**

- 2.1 Knows that an experiment must be repeated many times and yield consistent results before the results are accepted as correct
- 2.2 Knows that all scientific ideas are tentative and subject to change and improvement in principle, but for most core ideas in science, there is much experimental and observational confirmation
- 2.3 Understands that questioning, response to criticism, and open communication are integral to the process of science

### **Standard 3: The student understands the nature and tools of scientific inquiry.**

- 3.1 Knows that there is no fixed procedure called “the scientific method,” but that investigations involve systematic observations, carefully collected, relevant evidence, logical reasoning, and some imagination in developing hypothesis and explanations
- 3.2 Designs and conducts a scientific investigation
- 3.3 Knows that observations can be affected by bias
- 3.4 Uses appropriate tools and techniques to gather, analyze and interpret scientific data
- 3.5 Establishes relationships based on evidence and logical argument
- 3.6 Understands the nature of scientific explanations
- 3.7 Knows that scientific inquiry includes evaluating results of scientific investigations, experiments, observations, theoretical and mathematical models and explanations proposed by other scientists
- 3.8 Knows possible outcomes of scientific investigations

### **Standard 4: The student understands science as a human endeavor.**

4.1 Knows that people of all backgrounds and with diverse interests, talents, qualities, and motivations engage in fields of science and engineering; some of these people work in teams and others work alone, but all communicate extensively with others

4.2 Knows that the work of science requires a variety of human abilities, qualities, and habits of mind

4.3 Knows various settings in which scientists and engineers may work

4.4 Understands ethics associated with scientific study

4.5 Knows that throughout history, many scientific innovators have had difficulty breaking through accepted ideas of their time to reach conclusions that are now considered to be common knowledge

4.6 Knows ways in which science and society influence one another

**Standard 5: The student understands basic features of the earth.**

5.1 Knows that the earth is the only body in our solar system that appears able to support life

5.2 Knows that because of the tilt of the earth's axis, sunlight and, hence, heat fall more intensely on one part or another of the earth during its one-year revolution around the sun; the difference in heating of the earth's surface produces the planet's seasons and weather patterns

5.3 Knows the composition and structure of the earth's atmosphere

5.4 Knows that clouds, which are formed by the condensation of water vapor, affect weather and climate; some do so by reflecting much of the sunlight that reaches the earth from sun; others hold heat energy emitted from the earth's surface

**Standard 6: The student understands basic earth processes.**

6.1 Knows that rock is composed of different combinations of minerals and that changes in the solid earth occur constantly through the rock cycle.

6.2 Knows that sediments of sand and smaller particles are gradually buried, cemented together by dissolved minerals and eventually turned into rock again.

6.3 Knows that rock contains evidence of minerals, temperatures and forces that created it

**Standard 7: The student understands essential ideas about the composition and structure of the universe and the earth's place in it.**

7.1 Knows that nine planets of differing sizes and surface features and with differing compositions move around the sun in nearly circular orbits; some planets have a variety of moons and rings of particles orbiting around them

7.2 Knows that the sun is a medium sized star, located at the edge of a disk-shaped galaxy, part of which can be seen on a clear night as a glowing band of light

7.3 Knows that the moon's orbit around the earth once in some 28 days changes how much of the moon is lighted by the sun and how much of that part can be seen from earth, resulting in the phases of the moon

7.4 Knows that the universe contains many billions of galaxies, each containing many billions of stars

7.5 Knows that light travels from the sun to the earth in a few minutes, from the next nearest star in four years, and from very distant stars in several billion years; the distance light travels in a few years would take the fastest rocket thousands of years to travel

7.6 Knows that we live on a fairly small planet, the third from the sun in one of the systems of planets definitely known to exist

7.7 Knows that the sun's gravitational pull keeps the earth and other planets in their orbits, just as the gravitational pull of planets keeps their moons in orbit around them

**Standard 15: The student understands energy types, sources and conversions, and their relationship to heat and temperature.**

15.1 Knows that the sun is a major source of energy for changes on the earth's surface; the sun's energy arrives as light with a range of wavelengths consisting mainly of visible light with significant amounts of infrared and ultraviolet radiation

15.2 Knows that heat energy moves in predictable ways, flowing from warmer objects to cooler ones until both objects are at the same temperature

15.3 Knows that energy comes in different forms, such as light, heat, chemical, nuclear, mechanical and electrical

15.4 Knows that electrical circuits provide a means of converting electrical energy into heat, light, sound, chemical or other forms of energy

15.5 Understands that energy cannot be created or destroyed but only changed

**Standard 17: The student knows the kinds of forces that exist between objects and within atoms.**

17.1 Knows that every object exerts gravitational force on every other object; this force depends on the mass of the objects and their distance from one another; gravitational force is hard to detect unless at least one of the objects has a lot of mass

17.2 Knows that just as electric current can produce magnetic forces, magnets can cause electric current

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