Florida Science

Grade 8

Adopted 2008

The Practice of Science

1. **Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.** SC.8.N.1.1
2. **Design and conduct a study using repeated trials and replication.** SC.8.N.1.2
3. **Use phrases such as "results support" or "fail to support" in science, understanding that science does not offer conclusive 'proof' of a knowledge claim.** SC.8.N.1.3
4. **Explain how hypotheses are valuable if they lead to further investigations, even if they turn out not to be supported by the data.** SC.8.N.1.4
5. **Analyze the methods used to develop a scientific explanation as seen in different fields of science.** SC.8.N.1.5
6. **Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.** SC.8.N.1.6

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Identify a problem from the eighth grade curriculum, use reference materials to gather information, carry out an experiment, collect and record data, and report results. SC.8.N.1.IN.A

b. Identify a possible explanation (hypothesis) for a science problem. SC.8.N.1.IN.B

c. Identify methods used in different areas of science, such as life science, earth and space science, and physical science. SC.8.N.1.IN.C

d. Identify that the process used in scientific investigations involves asking a research question, forming a hypothesis, reviewing what is already known, collecting evidence through observations or experiments, determining results, and reaching conclusions. SC.8.N.1.IN.D

Supported

a. Recognize a problem from the eighth grade curriculum, use materials to gather information, conduct a simple experiment, and record and share results. SC.8.N.1.SU.A

b. Recognize a possible explanation (hypothesis) for a science problem. SC.8.N.1.SU.B

c. Recognize methods used in different areas of science, such as life science, earth and space science, and physical science. SC.8.N.1.SU.C

d. Recognize that the basic process used in scientific investigations involves questioning, observing, and recording and sharing results. SC.8.N.1.SU.D

Participatory

a. Recognize a problem related to the eighth grade curriculum, observe and explore objects and activities, and recognize a solution. SC.8.N.1.PA.A

b. Recognize science as a way to solve problems about the natural world. SC.8.N.1.PA.B

The Characteristics of Scientific Knowledge

1. **Distinguish between scientific and pseudoscientific ideas.** SC.8.N.2.1

2. **Discuss what characterizes science and its methods.** SC.8.N.2.2

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Identify that scientific knowledge must be supported by evidence. SC.8.N.2.IN.A

Supported

a. Recognize examples of evidence that supports scientific knowledge. SC.8.N.2.SU.A

Participatory

a. Recognize an example of observable evidence related to science. SC.8.N.2.PA.A

The Role of Theories, Laws, Hypotheses, and Models

1. **Select models useful in relating the results of their own investigations.** SC.8.N.3.1

2. **Explain why theories may be modified but are rarely discarded.** SC.8.N.3.2

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Identify models used in the context of one's own study of science. SC.8.N.3.IN.A

b. Identify that scientific theories can change. SC.8.N.3.IN.B

Supported

a. Recognize models used in the context of one's own study of science. SC.8.N.3.SU.A

Participatory

a. Associate a model with an activity used in the context of one's own study of science. SC.8.N.3.PA.A

b. Observe and recognize a cause-effect relationship related to a science topic. SC.8.N.3.PA.B

Science and Society

1. **Explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels.** SC.8.N.4.1

2. **Explain how political, social, and economic concerns can affect science, and vice versa.** SC.8.N.4.2

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Identify ways that science processes can be used to make informed decisions in the community, state, and nation. SC.8.N.4.IN.A

Supported

a. Recognize that science processes can be used to help people in the community and state make wise choices. SC.8.N.4.SU.A

Participatory

a. Recognize a way science is used in the community. SC.8.N.4.PA.A

Earth in Space and Time

1. **Recognize that there are enormous distances between objects in space and apply our knowledge of light and space travel to understand this distance.** SC.8.E.5.1
2. **Recognize that the universe contains many billions of galaxies and that each galaxy contains many billions of stars.** SC.8.E.5.2
3. **Distinguish the hierarchical relationships between planets and other astronomical bodies relative to solar system, galaxy, and universe, including distance, size, and composition.** SC.8.E.5.3
4. **Explore the Law of Universal Gravitation by explaining the role that gravity plays in the formation of planets, stars, and solar systems and in determining their motions.** SC.8.E.5.4
5. **Describe and classify specific physical properties of stars: apparent magnitude (brightness), temperature (color), size, and luminosity (absolute brightness).** SC.8.E.5.5
6. **Create models of solar properties including: rotation, structure of the Sun, convection, sunspots, solar flares, and prominences.** SC.8.E.5.6
7. **Compare and contrast the properties of objects in the Solar System including the Sun, planets, and moons to those of Earth, such as gravitational force, distance from the Sun, speed, movement, temperature, and atmospheric conditions.** SC.8.E.5.7
8. **Compare various historical models of the Solar System, including geocentric and heliocentric.** SC.8.E.5.8
9. **Explain the impact of objects in space on each other including: <ol type="1"> the Sun on the Earth including seasons and gravitational attraction the Moon on the Earth, including phases, tides, and eclipses, and the relative position of each body.
** SC.8.E.5.9

10. **Assess how technology is essential to science for such purposes as access to outer space and other remote locations, sample collection, measurement, data collection and storage, computation, and communication of information.** SC.8.E.5.10

11. **Identify and compare characteristics of the electromagnetic spectrum such as wavelength, frequency, use, and hazards and recognize its application to an understanding of planetary images and satellite photographs.** SC.8.E.5.11

12. **Summarize the effects of space exploration on the economy and culture of Florida.** SC.8.E.5.12

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Compare the distances of the Moon, the Sun, and other stars from the Earth. SC.8.E.5.IN.A

j. Recognize that the Moon's revolution around the Earth takes about thirty days. SC.8.E.5.IN.J

k. Identify technology used by scientists to locate, view, and study objects in space. SC.8.E.5.IN.K

l. Recognize that technology allows special cameras and satellites to take pictures of objects in space. SC.8.E.5.IN.L

m. Identify effects of space research and exploration on Florida's economy. SC.8.E.5.IN.M

b. Identify that the Earth and Sun are a part of the Milky Way galaxy. SC.8.E.5.IN.B

c. Identify Earth's position in the Solar System, and its size relative to the Moon and Sun. SC.8.E.5.IN.C

d. Identify gravity as the force that holds orbiting planets in place in the Solar System. SC.8.E.5.IN.D

e. Identify differences in physical properties of stars, such as brightness, color, and size. SC.8.E.5.IN.E

f. Describe the Sun as a mass of hot, burning gases that produces very high temperatures. SC.8.E.5.IN.F

g. Compare conditions on other planets in the Solar System to those on Earth, such as gravity, temperature, and atmosphere. SC.8.E.5.IN.G

h. Identify that long ago people thought the Sun traveled around Earth (geocentric model) until scientists proved otherwise. SC.8.E.5.IN.H

i. Recognize that the four seasons are related to Earth's position as it travels (revolves) around the Sun. SC.8.E.5.IN.I

Supported

a. Identify the relative positions of the Sun and the Moon from Earth. SC.8.E.5.SU.A

b. Recognize that the Solar System is part of a galaxy. SC.8.E.5.SU.B

c. Identify that there are planets and moons in the Solar System. SC.8.E.5.SU.C

d. Recognize that the Sun is the closest star to Earth and appears large and bright. SC.8.E.5.SU.D

e. Recognize that the Sun is made of gases that are on fire. SC.8.E.5.SU.E

f. Recognize that conditions on other planets in the Solar System are different than those on Earth. SC.8.E.5.SU.F

g. Recognize that Earth revolves around the Sun creating the four seasons. SC.8.E.5.SU.G

h. Recognize that scientists use special tools to examine objects in space. SC.8.E.5.SU.H

i. Identify an effect space exploration has had on Florida's economy. SC.8.E.5.SU.I

Participatory

a. Recognize that the Moon is closer to Earth than the Sun. SC.8.E.5.PA.A

b. Recognize the Sun and stars as objects in space. SC.8.E.5.PA.B

c. Recognize the four seasons. SC.8.E.5.PA.C

d. Recognize a technology tool created for space exploration and adapted for personal use, such as computers, telescopes, or satellites. SC.8.E.5.PA.D

Properties of Matter

1. **Explore the scientific theory of atoms (also known as atomic theory) by using models to explain the motion of particles in solids, liquids, and gases.** SC.8.P.8.1

2. **Differentiate between weight and mass recognizing that weight is the amount of gravitational pull on an object and is distinct from, though proportional to, mass.** SC.8.P.8.2

3. **Explore and describe the densities of various materials through measurement of their masses and volumes.** SC.8.P.8.3

4. **Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured; for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.** SC.8.P.8.4

5. **Recognize that there are a finite number of elements and that their atoms combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.** SC.8.P.8.5

6. **Recognize that elements are grouped in the periodic table according to similarities of their properties.** SC.8.P.8.6

7. **Explore the scientific theory of atoms (also known as atomic theory) by recognizing that atoms are the smallest unit of an element and are composed of sub-atomic particles (electrons surrounding a nucleus containing protons and neutrons).** SC.8.P.8.7

8. **Identify basic examples of and compare and classify the properties of compounds, including acids, bases, and salts.** SC.8.P.8.8

9. **Distinguish among mixtures (including solutions) and pure substances.** SC.8.P.8.9

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Compare properties of solids, liquids, and gases. SC.8.P.8.IN.A

b. Recognize that the weight of an object is related to the pull of gravity. SC.8.P.8.IN.B

c. Observe and compare the density of various materials. SC.8.P.8.IN.C

d. Observe and compare substances based on their physical properties, such as thermal and electrical conductivity, solubility, or magnetic properties. SC.8.P.8.IN.D

e. Recognize that common elements combine in different ways to make up all living and nonliving things. SC.8.P.8.IN.E

f. Identify common elements, such as oxygen, iron, and carbon. SC.8.P.8.IN.F

g. Identify that matter is made of small particles called atoms. SC.8.P.8.IN.G

h. Identify common acids, such as lemon juice and vinegar, and bases, such as baking soda and ammonia, and their hazardous properties. SC.8.P.8.IN.H

i. Identify common materials as pure substances or mixtures. SC.8.P.8.IN.I

Supported

a. Recognize three states of matter, including solids, liquids, and gases. SC.8.P.8.SU.A

b. Compare the weight of different sized objects. SC.8.P.8.SU.B

c. Recognize that smaller objects can weigh more than bigger objects because of density. SC.8.P.8.SU.C

d. Observe and compare substances by physical properties, such as weight, size, boiling and melting points, and magnetic properties. SC.8.P.8.SU.D

e. Recognize that parts of matter can be separated in tiny particles. SC.8.P.8.SU.E

f. Recognize examples of common elements, such as carbon or iron. SC.8.P.8.SU.F

g. Recognize common acids, such as vinegar, and bases, such as ammonia, and their hazardous properties. SC.8.P.8.SU.G

h. Recognize examples of pure substances and mixtures. SC.8.P.8.SU.H

Participatory

a. Recognize examples of the gaseous state of matter, such as steam or smoke. SC.8.P.8.PA.A

b. Recognize the heavier of two objects. SC.8.P.8.PA.B

c. Recognize substances by physical properties, such as weight (heavy and light), size (big and small), and temperature (hot and cold). SC.8.P.8.PA.C

d. Recognize common acids as safe or harmful. SC.8.P.8.PA.D

e. Separate a mixture into its parts. SC.8.P.8.PA.E

Changes in Matter

1. **Explore the Law of Conservation of Mass by demonstrating and concluding that mass is conserved when substances undergo physical and chemical changes.** SC.8.P.9.1

2. **Differentiate between physical changes and chemical changes.** SC.8.P.9.2

3. **Investigate and describe how temperature influences chemical changes.** SC.8.P.9.3

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Observe and classify changes in matter as physical (reversible) or chemical (irreversible). SC.8.P.9.IN.A

b. Observe and identify how temperature influences chemical changes. SC.8.P.9.IN.B

Supported

a. Observe and recognize physical changes in matter as able to change back (reversible), such as water to ice, and chemical changes of matter as unable to change back (irreversible), such as cake to cake batter. SC.8.P.9.SU.A

b. Observe and recognize changes caused by heat on substances. SC.8.P.9.SU.B

Participatory

a. Recognize an example of a physical change, such as ice changing to water. SC.8.P.9.PA.A

b. Recognize that heat influences changes (chemical) in matter, such as cooking. SC.8.P.9.PA.B

Matter and Energy Transformations

1. **Describe and investigate the process of photosynthesis, such as the roles of light, carbon dioxide, water and chlorophyll; production of food; release of oxygen.** SC.8.L.18.1

2. **Describe and investigate how cellular respiration breaks down food to provide energy and releases carbon dioxide.** SC.8.L.18.2

3. **Construct a scientific model of the carbon cycle to show how matter and energy are continuously transferred within and between organisms and their physical environment.** SC.8.L.18.3

4. **Cite evidence that living systems follow the Laws of Conservation of Mass and Energy.** SC.8.L.18.4

Access Point for Students with Significant Cognitive Disabilities

Independent

a. Identify structures in plants that enable them to use the energy from the Sun to make their own food through a process called photosynthesis. SC.8.L.18.IN.A

b. Recognize that cells break down food to release energy. SC.8.L.18.IN.B

c. Illustrate a model that shows how carbon is cycled between plants and animals. SC.8.L.18.IN.C

d. Identify the flow of energy from the Sun as it is transferred along a food chain. SC.8.L.18.IN.D

Supported

a. Recognize that plants make their own food through a process called photosynthesis. SC.8.L.18.SU.A

b. Recognize that plants and animals get energy from food. SC.8.L.18.SU.B

c. Recognize that plants use the carbon dioxide that animals breathe out. SC.8.L.18.SU.C

d. Recognize that plants get energy from the Sun and that energy is transferred to the animals that eat the plants. SC.8.L.18.SU.D

Participatory

a. Recognize that plants need water and light to grow. SC.8.L.18.PA.A

b. Recognize that food provides energy. SC.8.L.18.PA.B