

§112.2. Science, Kindergarten.

(a) Introduction.

(1) In Kindergarten, science introduces the use of simple classroom and field investigations to help students develop the skills of asking questions, gathering information, communicating findings, and making informed decisions. Using their own senses and common tools such as a hand lens, students make observations and collect information. Students also use computers and information technology tools to support their investigations.

(2) As students learn science skills, they identify components of the natural world including rocks, soil, and water. Students observe the seasons and growth as examples of change. In addition, Kindergarten science includes the identification of organisms and objects and their parts. Students learn how to group living organisms and nonliving objects and explore the basic needs of living organisms.

(3) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(4) A system is a collection of cycles, structures, and processes that interact. Students should understand a whole in terms of its components and how these components relate to each other and to the whole. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems and can be observed and measured as patterns. These patterns help to predict what will happen next and can change over time.

(5) Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(b) Knowledge and skills.

(1) Scientific processes. The student participates in classroom and field investigations following home and school safety procedures. The student is expected to:

(A) demonstrate safe practices during classroom and field investigations; and

(B) learn how to use and conserve resources and materials.

(2) Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom. The student is expected to:

(A) ask questions about organisms, objects, and events;

- (B) plan and conduct simple descriptive investigations;
- (C) gather information using simple equipment and tools to extend the senses;
- (D) construct reasonable explanations using information; and
- (E) communicate findings about simple investigations.

(3) Scientific processes. The student knows that information and critical thinking are used in making decisions. The student is expected to:

- (A) make decisions using information;
- (B) discuss and justify the merits of decisions; and
- (C) explain a problem in his/her own words and propose a solution.

(4) Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described, and measured. The student is expected to:

- (A) identify and use senses as tools of observation; and
- (B) make observations using tools including hand lenses, balances, cups, bowls, and computers.

(5) Science concepts. The student knows that organisms, objects, and events have properties and patterns. The student is expected to:

- (A) describe properties of objects and characteristics of organisms;
- (B) observe and identify patterns including seasons, growth, and day and night and predict what happens next; and
- (C) recognize and copy patterns seen in charts and graphs.

(6) Science concepts. The student knows that systems have parts and are composed of organisms and objects. The student is expected to:

- (A) sort organisms and objects into groups according to their parts and describe how the groups are formed;
- (B) record observations about parts of plants including leaves, roots, stems, and flowers;
- (C) record observations about parts of animals including wings, feet, heads, and tails;

(D) identify parts that, when separated from the whole, may result in the part or the whole not working, such as cars without wheels and plants without roots; and

(E) manipulate parts of objects such as toys, vehicles, or construction sets that, when put together, can do things they cannot do by themselves.

(7) Science concepts. The student knows that many types of change occur. The student is expected to:

(A) observe, describe, and record changes in size, mass, color, position, quantity, time, temperature, sound, and movement;

(B) identify that heat causes change, such as ice melting or the Sun warming the air and compare objects according to temperature;

(C) observe and record weather changes from day to day and over seasons; and

(D) observe and record stages in the life cycle of organisms in their natural environment.

(8) Science concepts. The student knows the difference between living organisms and nonliving objects. The student is expected to:

(A) identify a particular organism or object as living or nonliving; and

(B) group organisms and objects as living or nonliving.

(9) Science concepts. The student knows that living organisms have basic needs. The student is expected to:

(A) identify basic needs of living organisms;

(B) give examples of how living organisms depend on each other; and

(C) identify ways that the Earth can provide resources for life.

(10) Science concepts. The student knows that the natural world includes rocks, soil, and water. The student is expected to:

(A) observe and describe properties of rocks, soil, and water; and

(B) give examples of ways that rocks, soil, and water are useful.