# Eads Elementary School Science Standards
# 5thGrade

**SCIENCE STANDARD #1**

Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

| Ref. | Expectation | P | PP | NI | US |
|---|---|---|---|---|---|
| 5.1.a. | Tell what question they are going to answer or problem they are trying to solve by doing an investigation. | | | | |
| 5.1.b. | Predict what will happen and explain. | | | | |
| 5.1.c. | Explain the difference between a prediction and a guess. | | | | |
| 5.1.d. | Follow multiple-step written directions. | | | | |
| 5.1.e. | Use tools (eg: hand lens, thermometer, hot plate) typical of science to gather data. | | | | |
| 5.1.f. | Do multiple trials or observations when appropriate and explain the reason for doing so. | | | | |
| 5.1.g. | Find means (showing work). | | | | |
| 5.1.h. | Set up a bar or line graph labeling the axes with words and numbers with each axis identified. | | | | |
| 5.1.i. | Make drawings to illustrate key characteristics of an object or organism and label. | | | | |
| 5.1.j. | Answer questions and describe general trends using their graph. | | | | |
| 5.1.k. | Use evidence to generate explanations. | | | | |
| 5.1.l. | Compare results with prediction and answer the question they are investigating. | | | | |
| 5.1.m. | Identify things that could cause their results to differ from the rest of the class. | | | | |
| 5.1.n. | Share results and explanations with other students. | | | | |
| 5.1.o. | Estimate length using centimeters and meters. | | | | |
| 5.1.p. | Label units (cm, m, km) | | | | |
| 5.1.q. | Generate questions during and after an investigation based on their observations, data, or variables. | | | | |
| 5.1.r. | Suggest a simple investigation to answer one of the questions generated. | | | | |

**SCIENCE STANDARD #2**

PHYSICAL SCIENCE: Students know and understand common properties, forms, and changes in matter and energy.

2A. Heat and changes of State: In fifth grade, students learn that when substances change state, energy in the form of heat is either added or removed.

| Ref. | Expectation | P | PP | NI | US |
|---|---|---|---|---|---|
| 5.2A.a. | Describe water in each of its states. | | | | |
| 5.2A.b. | Describe what happens to volume when water changes from solid to liquid or vice versa. | | | | |
| 5.2A.c. | Use a particle model to explain the different forms (solid, liquid, gas) that **water** can take. | | | | |

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| 5.2A.d. | Provide evidence to show that water does not disappear when it evaporates. | | | | |
| 5.2A.e. | Collect and graph temperature data to identify freezing and melting points of a substance. | | | | |
| 5.2A.f. | Define the term “cooling” as being the removal of heat or loss of energy. | | | | |
| 5.2A.g. | Describe the changes in state represented on a graph that shows freezing or melting point. | | | | |
| 5.2A.h. | Compare what happens to a substance when it freezes to what happens when it melts. | | | | |
| 5.2A.i. | Describe variables that can affect the rate of evaporation. | | | | |
| 5.2A.j. | Realize that things that give off light often give off heat, too. | | | | |
| 5.2A.k. | Describe what happens when a substance changes state using the terms heat, boiling, freezing, and/or melting point. | | | | |
| 5.2A.l. | Explain that adding heat increases temperature and removing it decreases temperature. | | | | |
| 5.2A.m. | Explain the transfer of heat when liquids of different temperatures are mixed. | | | | |
| 5.2A.n. | Predict what will happen to the temperature as a substance melts. | | | | |

2.B. Force and Motion: In fifth grade, students learn that the motion of an object can be described and measured and that a force is needed to change the motion of an object.

| Ref. | Expectation | P | PP | NI | US |
|---|---|---|---|---|---|
| 5.2B.a. | Observe and describe how friction can change the motion of an object. | | | | |
| 5.2B.b. | Demonstrate how different surfaces affect the motion of an object (friction). | | | | |
| 5.2B.c. | Identify surfaces for which friction would be greater. | | | | |
| 5.2B.d. | Record the time it takes an object to move a set distance (and vice versa). | | | | |
| 5.2B.e. | Observe and describe how the mass of an object affects the time it takes the object to move a given distance. | | | | |
| 5.2B.f. | Name gravity, friction, pushes, and pulls as examples of forces. | | | | |
| 5.2B.g. | Apply a force to a moving object and describe how the object’s motion changes. | | | | |
| 5.2B.h. | Demonstrate that when the push equals the pull no movement occurs. | | | | |
| 5.2B.i. | Demonstrate how to change the position or motion of an object without physically touching the object (eg: air movement, magnets). | | | | |
| 5.2B.j. | Measure time and distance for objects that are moving in a straight line. | | | | |
| 5.2B.k. | Describe speed in words and numbers. | | | | |
| 5.2B.l. | Represent simple straight line motion on a graph. | | | | |
| 5.2B.m. | Figure the average speed of a moving object by dividing the distance traveled by the time it took to travel that distance. | | | | |
| 5.2B.n. | Use a speed to calculate either the distance the object can go in a set amount of time or the amount of time it would take to go a certain distance. | | | | |

**SCIENCE STANDARD #3:**

LIFE SCIENCE: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environments.

Respiratory System, Growing and Changing: In fifth grade, students learn that people, like all animals, need a constant supply of air. People go through predictable changes as they grow.

| Ref. | Expectations | P | PP | NI | US |
|---|---|---|---|---|---|
| 5.3.a. | Recall the basic needs of animals (food, water, air, and shelter) | | | | |
| 5.3.b. | Know that oxygen is the substance in air that is necessary for the survival of humans (and most other animals.) | | | | |
| 5.3.c. | Explain that some of the parts inside our body work together to move air in and out of our bodies. | | | | |
| 5.3.d. | Name the four main parts of the respiratory system (nose, trachea, bronchial tubes, lungs). | | | | |
| 5.3.e. | Describe the main function of each part of the respiratory system. | | | | |
| 5.3.f. | Sketch the respiratory system. | | | | |
| 5.3.g. | Know that exhaled air contains more carbon dioxide than inhaled air. | | | | |
| 5.3.h. | Describe what happens to the lungs when a person smokes cigarettes. | | | | |
| 5.3.i. | Name the main parts of the female reproductive system (ovaries, fallopian tubes, uterus, vagina) and of the male reproductive system (testes, epididymis, vas deferens, penis). | | | | |
| 5.3.j. | Know that eggs are made in the ovaries and sperm in the testes. | | | | |
| 5.3.k. | Trace the path of an egg and sperm when it leaves the body. | | | | |
| 5.3.l. | Explain that the reproductive system is important for the survival of the species, not for the survival of an individual. | | | | |
| 5.3.m. | List several examples of changes that take place during puberty. | | | | |
| 5.3.n. | Explain that during puberty the reproductive system begins to mature. | | | | |
| 5.3.o. | Sequence drawings that show several life stages of a human, beginning with a sperm and egg. | | | | |
| 5.3.p. | Explain the term life cycle (a fertilized egg grows into a baby that eventually becomes an adult who can have a baby.) | | | | |
| 5.3.q. | Recall the stages in the life cycle of an insect. (Grade 3) | | | | |
| 5.3.r. | Describe the stages in the life cycle of a bird. | | | | |
| 5.3.s. | Know how a bird meets its need for food, water, and air when it is in the egg. | | | | |
| 5.3.t. | Compare the stages in the life cycle of a human with that of an insect or a bird. | | | | |

**SCIENCE STANDARD #4:**

EARTH AND SPACE SCIENCE: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. Weather: In fifth grade, students learn how heat energy from the Sun and other factors affect weather and the cycling of water.

| Ref. | Expectation | P | PP | NI | US |
|---|---|---|---|---|---|
| 5.4.a. | List the components of air (gases, water, dust particles). | | | | |
| 5.4.b. | Provide evidence that air takes up space and has mass. | | | | |
| 5.4.c. | Describe weather conditions based on data collected using weather tools (eg: thermometer, anemometer, rain gauge). | | | | |
| 5.4.d. | Plot weather data on a bar or line graph and use it to describe weather | | | | |

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| | changes over time. | | | | |
| 5.4.e. | Use data to describe how air temperatures change from lower to higher elevations. | | | | |
| 5.4.f. | Use a model to show how water and land surfaces heat differently thus producing wind. | | | | |
| 5.4.g. | Describe the general pattern of how temperature changes over 24 hours. | | | | |
| 5.4.h. | Explain (using words or drawings) why the polar regions receive less solar energy than the equator. | | | | |
| 5.4.i. | Know that the Sun is the source of energy that heats air masses which result sin the movement of these masses. | | | | |
| 5.4.j. | Use several pieces of evidence (cloud observations, weather maps) to show that weather conditions generally move from west to east in the United States. | | | | |
| 5.4.k. | Explain how oceans, latitude, and elevation affect local weather conditions. | | | | |
| 5.4.l. | Investigate and compare the properties and behavior of water in its solid, liquid, and gaseous states (See “Heat and Changes of State,” Standard 2). | | | | |
| 5.4.m. | Describe conditions that affect rates of evaporation and condensation. | | | | |
| 5.4.n. | Explain the connection between clouds and the water cycle. | | | | |
| 5.4.o. | Make and label an illustration or model of a water cycle. | | | | |

**SCIENCE STANDARD #5:**

Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.

| Ref. | Expectations | P | PP | NI | US |
|---|---|---|---|---|---|
| 5.5.a. | Identify a stopwatch as being a device that allows us to time an event with a great deal of accuracy. | | | | |
| 5.5.b. | Explain that meteorologists use a variety of tools to collect data about the weather which they can then use to look for patterns. | | | | |

**SCIENCE STANDARD #6:**

Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.

| Ref. | Expectations | P | PP | NI | US |
|---|---|---|---|---|---|
| 5.6.a. | Identify factors that can affect how long it takes water to change from a liquid to a gas. | | | | |
| 5.6.b. | Explain why the word “cycle” is included in the term “water cycle.” | | | | |
| 5.6.c. | Sketch a water cycle. | | | | |
| 5.6.d. | Explain the evaporation of water in terms of the movement of very tiny water ‘particles.” | | | | |