SCIENCE CONTENT STANDARDS
GRADE 3

In grade 3, students learn about energy and matter, a beginning for building a foundation of understanding the structure of matter and forces of interaction in later grades. The energy in sunlight, an ocean wave, and a flashlight battery are similar in that all are capable of being used to do useful work. Matter is anything that has mass and occupies volume, and all matter is made out of over 100 different types of atoms of which 90 occur in nature. Students also study the properties of light.

Students extend their knowledge of ecology in grade 3, learning about different environments such as oceans, deserts, tundra, forests, grasslands, and wetlands, and the types of organisms adapted to live in each. Organisms change the environment in which they live, and this can have both positive and negative consequences for other forms of life. For organisms unable to either adapt or move, significant changes in the environment can lead to extinction.

The apparent movements of the Sun, Moon, and stars in the sky are studied in grade 3, and this serves as a foundation for a more detailed discussion in later grades. The pattern of the moon's phases can be observed and predicted. The explanation for the different phases of the Moon during the lunar cycle can be taught to students to show the underlying explanation for the observed patterns. Students can be introduced to images of more distant objects obtained from telescopes.

Grade 3 students are capable of making sophisticated observations and understanding the importance of repeating observations to improve accuracy and certainty. They can tell the difference between evidence and opinion, and remain skeptical about claims that are not backed by reproducible data. Students collect and analyze data to develop a logical conclusion. They can use and analyze numerical data from investigations, and compare their predictions with experimental results. Confirming the accuracy of the data demonstrates that scientific processes lead to sound conclusions.

Physical Sciences

- Energy and matter have multiple forms and can be changed from one form to another. As a basis for understanding this concept, students know:
  - **energy comes from the sun to the Earth in the form of light.**
  - sources of stored energy take many forms, such as food, fuel, and batteries.
  - machines and living things convert stored energy to motion and heat.
  - energy can be carried from one place to another by waves, such as water waves and sound, by electric current, and by moving objects.
  - matter has three forms: solid, liquid, and gas.
  - evaporation and melting are changes that occur when objects are heated.
  - **that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.**
  - **all matter is made of small particles called atoms, too small to see with the naked eye.**
  - science experiments show that there are more than 100 different types of atoms, which are presented on the periodic table of elements.

- Light has a source and travels in a direction. As a basis for understanding this concept, students know:
  - sunlight can be blocked to create shadows.
  - light is reflected from mirrors and other surfaces.
  - the color of light striking an object affects how our eyes see it.
  - we see objects when light traveling from an object enters our eye.

Life Sciences

- Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept, students know:
  - **plants and animals have structures that serve different functions in growth, survival, and reproduction.**
  - **examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.**
  - living things cause changes in the environment where they live; some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.
  - when the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.
  - some kinds of organisms that once lived on Earth have completely disappeared; some of these resembled others that are alive today.
  - living things can be classified according to their structure.

Earth Sciences

- Objects in the sky move in regular and predictable patterns. As a basis for understanding this concept, students know:
  - the patterns of stars stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.
  - **how the moon's appearance changes during the four-week lunar cycle.**
  - telescopes magnify the appearance of some distant objects in the sky, including the moon and the planets. The number of stars that can be seen through telescopes is dramatically greater than can be seen by the unaided eye.
  - **the Earth is one of several planets that orbit the sun, and the moon orbits the Earth.**
  - **the position of the sun in the sky changes during the course of the day and from season to season.**
  - the sun, an average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.
  - the solar system includes the Earth, moon, sun, eight other planets, and their satellites, and smaller objects such as asteroids and comets.

Science Process Skills (Investigation and Experimentation)

- Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations. Students will:
  - **repeat observations to improve accuracy, and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.**

- differentiate evidence from opinion, and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.
- use numerical data in describing and comparing objects, events and measurements.
- predict the outcome of a simple investigation, and compare the result to the prediction.
- collect data in an investigation and analyze them to develop a logical conclusion.