Science
Eighth Grade

1.0 Understands and applies the skills of scientific inquiry.
1.1 Uses scientific inquiry to design, conduct, and analyze scientific investigations.
1.2 Identifies questions and concepts that guide scientific investigations.
1.3 Understands that different kinds of questions suggest different kinds of investigations.
1.4 Uses appropriate models when necessary.
1.5 Develops hypothesis.
1.6 Identifies controls and variables.
1.7 Designs and executes scientific investigations.
1.8 Selects and uses appropriate tools, technology and techniques to gather data.
1.9 Makes appropriate qualitative and quantitative observations.
1.10 Recognizes the importance of multiple trials with reproducible results.
1.11 Organizes data and observations efficiently, including creating appropriate tables and graphs.
1.12 Analyzes and evaluate the data and observations.
1.13 Integrates data and observations to draw appropriate conclusions.
1.14 Accounts for errors in investigations.
1.15 Uses various methods to communicate experimental methods, observations, results, and interpretations.
1.16 Students use appropriate safety procedures when conducting investigations.
1.17 Recognizes that safety concerns change with different procedures.

2.0 Understands and applies scientific concepts, principles, and theories pertaining to Earth and the Universe.
2.1 Understands and applies knowledge of energy in the Earth system including internal and external sources of energy, plate tectonics, and energy transfer in the atmosphere and the ocean.
2.2 Identifies that the sun is the principle energy source for living things.
2.3 Understand and apply knowledge of geochemical cycles including the elements and atoms within and moving between Earth's hydrosphere, lithosphere, and atmosphere.
2.4 Describes the composition and layers of the Earth's atmosphere.

2.5 Understands and applies knowledge of the origin and evolution of the Earth system including formation of the solar system, geologic time, interactions among hydrosphere, lithosphere, and atmosphere and origins and evolution of life.
2.6 Identifies ways in which clouds affect weather and climate.
2.7 Recalls how the tilt of the Earth's axis and the Earth's rotation around the sun determines season.
2.8 Recognizes that weather and climate involve the transfer of energy in and out of the atmosphere.

3.0 Understands and applies concepts, principles and theories pertaining to life and its interactions.

3.1 Understand and applies knowledge of the cell and its processes.

Lists cell structures and their function.
Describes the differences between prokaryotic and Eukaryotic cells.
Recognizes cell transport processes.
Describes how environmental conditions can affect cell processes.
Relates the importance of cell specialization to the development of organisms.
Restates the processes of cell growth and division.
Describes how cell respiration breaks down glucose molecules to provide energy.
Describes the relationship between photosynthesis and cellular respiration.

3.2 Understands and applies knowledge of the molecular basis of heredity.

Identifies the structure of DNA.
Recognizes the process of base pairing.
Explains how the structure of DNA allows it to preserve genetic information.
Recalls the multiple scientists and their role in the discovery of DNA.
Describes the role of DNA and messenger RNA in protein synthesis.
Recalls that the sequence of DNA determine the genetic information found in genes.
Names the types of genetic mutations.
Recognizes that genes control protein synthesis.
Recognizes that proteins determine the phenotype of organisms.
Compares and contrasts body and sex cells.
Describes the stages and importance of meiosis.
Completes Punnett Squares to demonstrate genetic probability.
Recalls that sexual reproduction and mutations provide the variation seen in a population.

3.3 Understand and applies knowledge of biological evolution.
3.4 Recognizes Darwin's Theory of evolution by natural selection.
3.5 Knows the factors that cause species to change over time.
3.6 Understand the identification, organization, and structure of living organisms.

- Lists the characteristics that all living things share in common.
- Recognizes how dichotomous key is used to identify organisms.
- States the importance of using scientific names.
- Lists the levels of classification of organisms.

4.0 Understands and applies concepts and theories pertaining to matter, its composition and the forces that govern it.

4.1 Understands and applies knowledge of interactions of energy and matter.
4.2 Identifies properties and behaviors of waves.
4.3 Identifies properties of electromagnetic waves.
4.4 Recalls the range of the electromagnetic spectrum.
4.5 Describes the properties of sound waves.
4.6 States the law of reflection of light.

5.0 Understands the Nature of Science.

5.1 Understands how science develops and changes over time.
5.2 States that all scientific ideas are tentative and subject to change and improvement with data to support this.
5.3 Knows that most core scientific theories have large quantities of experimental and observational evidence.
5.4 Realizes that scientific innovations have had difficulty breaking through the accepted ideas of their time to reach new conclusions that are now considered to be common knowledge.
5.5 Knows that people continue inventing new ways of doing things, solving problems, and getting work done.
5.6 Understands the dynamic relationship between science and society.
5.7 Identifies ways human behavior can affect Earth.