Eighth Grade Nature of Science

(Comprehension) 8.N.1.1. Students are able to differentiate among facts, predictions, theory, and law/principles in scientific investigations.

I can tell the differences (differentiate) among facts, predictions, theories, and law/principles in scientific experiments (scientific investigations).

(Synthesis) 8.N.2.1. Students are able to design a replicable scientific investigation.

I can create (design) a repeatable (replicable) scientific experiment (scientific investigation)
- using equipment correctly
- making a hypothesis
- identifying a control
- identifying a variable
- making predictions
- making observations
- drawing conclusions.

Eighth Grade Nature of Science Performance Descriptors

Eighth grade students performing at the advanced level:
• justify facts, predictions, theory, and law/principles in scientific investigations;
• design and conduct a replicable scientific investigation.

Eighth grade students performing at the proficient level:
• differentiate among facts, predictions, theory, and law/principles in scientific investigations;
• design a replicable scientific investigation.

Eighth grade students performing at the basic level:
• define fact, prediction, and theory;
• follow instructions to conduct a systematic scientific investigation.

Eighth Grade Physical Science

After careful consideration of current research and input from educators throughout the state, the Committee revised former standards to facilitate effective instruction and student mastery. Grade eight standards emphasize Earth/Space Science.

(Analysis) 8.P.1.1. Students are able to classify matter as elements, compounds, or mixtures.

I can group (classify) matter as:
- being made up of only one kind of atom (elements)
- a chemical combination of two or more different elements (compounds)
- two or more substances that are not chemically combined and can be separated by physical means (mixtures).

(Application) 8.P.1.2. Students are able to use the Periodic Table to compare and contrast families of elements and to classify elements as metals, metalloids, or non-metals.

I can use the periodic table to tell how families or elements are alike and different (compare and contrast).
I can use the periodic table to categorize (classify) elements
- that are good conductors, malleable and ductile (metals)
- that have both metal and nonmetal properties (metalloids)
- that lack the physical and chemical properties of metals (nonmetals).

(Comprehension) 8.P.1.3. Students are able to compare properties of matter resulting from physical and chemical changes.

I can tell similarities and differences (compare) properties of matter before and after the change in the form of a substance but not in its chemical composition (physical changes).
I can tell similarities and differences (compare) properties of matter before and after a reaction where substances with different properties are formed (chemical changes).

Eighth Grade Physical Science Performance Descriptors
Eighth grade students performing at the advanced level:
• create models of elements, compounds, or mixtures;
• explain the predictive nature of the Periodic Table;
• predict properties of matter resulting from physical and chemical changes.
Eighth grade students performing at the proficient level:
• classify matter as elements, compounds, or mixtures;
• use the Periodic Table to compare and contrast families of elements and classify elements as metals, metalloids, nonmetals;
• compare properties of matter resulting from physical and chemical changes.
Eighth grade students performing at the basic level:
• define elements, compounds, and mixtures;
• use the Periodic Table to identify elements as metals, metalloids, non-metals;
• identify physical and chemical changes.

Eighth Grade Life Science
After careful consideration of current research and input from educators throughout the state, the Committee revised former standards to facilitate effective instruction and student mastery. Grade eight standards emphasize Earth/Space Science.

Eighth Grade Earth/Space Science

(Application) 8.E.1.1. Students are able to identify and classify minerals and rocks.

I can select from given information (identify) and assign to categories (classify):
- naturally occurring, solid chemical compounds, that have a crystalline structure and properties that include luster, streak, fracture, cleavage, hardness, color, magnetism and

reactivity to acid (minerals).
- naturally occurring materials composed of a mineral mixture formed by sedimentary, igneous or metamorphic processes (rocks).

(Analysis) 8.E.1.2. Students are able to explain the role of plate tectonics in shaping Earth.

I can give reasons why (explain) the theory that sections of the Earth's crust are in motion due to convection currents in the mantle (plate tectonics), has a role in formation of
- plate boundaries
- volcanoes
- earthquakes
- mountains
(shaping Earth).

(Analysis) 8.E.1.3. Students are able to explain the factors that create weather and the instruments and technologies that assess it.

I can give reasons why (explain) air masses, fronts, pressure systems, wind systems, temperature, humidity and the Coriolis effect (factors) create conditions of the atmosphere (weather) and are measured (assessed) by thermometers, barometers, psychrometers and anemometers (instruments and technologies).

(Application) 8.E.1.4. Students are able to examine the chemical and physical properties of the ocean to determine causes and effects of currents and waves.

I can tell what happens to (examine) the temperature and salinity (chemical and physical properties) of the ocean to find appropriate information (determine) about the causes and effects of streams of moving water flowing through the ocean (currents).
I can tell what happens to (examine) the temperature and salinity (chemical and physical properties) of the ocean to find appropriate information (determine) about the causes and effects of the movement of energy that creates a ridge or swell moving along the surface of a body of water (waves).

(Analysis) 8.E.1.5. Students are able to explain the impact of weathering and erosion on the Earth.

I can give reasons why (explain) soil formation, deposition, land transformations or glaciation (impact) are caused by physical and chemical breakdown of material due to exposure (weathering) and wearing away of the land by the action of water, ice, or wind (erosion) on the Earth.

(Analysis) 8.E.2.1. Students are able to compare celestial bodies within the solar system using composition, size, and orbital motion.

I can tell similarities and differences among (compare) objects the Sun, planets, asteroids

and comets (celestial bodies) within our solar system using what something is made of (composition), size, and orbital motion.

(Analysis) 8.E.2.2. Students are able to differentiate the influences of the relative positions of the Earth, Moon, and Sun.

I can state the differences (differentiate) in the positions of the Earth, Moon and Sun during lunar and solar eclipses, moon phases, tides and seasons (influences of the relative positions).

Eighth Grade Earth/Space Science Performance Descriptors

Eighth grade students performing at the advanced level:

• use classification methods, identify, and classify unknown minerals and rocks;
• give evidence that supports the theory of plate tectonics;
• analyze weather maps and make basic predictions;
• predict the climate of a coastal region based on ocean currents;
• given a scenario, predict the consequences of weathering and/or erosion;
• construct a scale model of the solar system;
• predict the effects on the Earth's environment if tilt, distance, or atmosphere were changed.

Eighth grade students performing at the proficient level:

• identify and classify minerals and rocks;
• explain the role of plate tectonics in shaping Earth;
• explain the factors that create weather and the instruments that assess it;
• examine the chemical and physical properties of the ocean to determine causes and effects of currents and waves;
• explain the impact of weathering and erosion on the earth;
• compare celestial bodies within the solar system using composition, size, and orbital motion;
• differentiate the influences of the relative positions of the Earth, Moon, and Sun.

Eighth grade students performing at the basic level:

• identify rocks as sedimentary, igneous, or metamorphic;
• describe activity that occurs along plate boundaries;
• define basic weather vocabulary;
• list a physical and chemical property of the oceans;
• describe the difference between weathering and erosion;
• identify the basic objects of the solar system;
• describe how the tilt of the Earth is a cause of the seasons.

Eighth Grade Science, Technology, Environment, and Society

(Comprehension) 8.S.1.1. Students are able to describe how science and technology have been influenced by social needs, attitudes, and values.

I can tell in words or numbers (describe) how science and the practical application of scientific principles (technology) have been influenced by social needs, attitudes, and

values.

(Synthesis) 8.S.2.1. Students are able, given a scenario, to offer solutions to problems created by human activity on the local, regional, or global environment.

I can, given a story (scenario), provide (offer) solutions to global warming and deforestation (problems created by human activity) on biotic and abiotic factors (environment) in the local, regional, or global area.

<u>Eighth Grade Science, Technology, Environment, and Society Performance Descriptors</u>

Eighth grade students performing at the advanced level:

• defend a proposed solution or offer alternative solutions to a problem.

Eighth grade students performing at the proficient level:

• describe how science and technology have been influenced by social needs, attitudes, and values;

• given a scenario, offer solutions to problems created by human activity on the local, regional, or global environment.

Eighth grade students performing at the basic level:

• predict a possible consequence of a solution to a problem.