Science
STANDARD 1:

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

In everyday life, we find ourselves gathering and evaluating information (data), noting and wondering about patterns and regularities, devising and testing possible explanations for how things work, and discussing ideas with others. These characteristically human activities mirror in many ways how scientists think and work.

Scientific investigation (inquiry) often begins with a question or problem and usually ends with further questions to investigate. Such investigations may include long-term field studies and are not limited to direct experimentation in a lab setting. They involve the identification and control of variables. Inquiry in the science classroom helps students develop a useful base of scientific knowledge, communicated in increasingly mathematical and conceptual ways as they progress through school. In addition, scientific inquiry stimulates student interest, motivation, and creativity. Designing and conducting investigations encourages students to interpret, analyze, and evaluate what is known, how we know it, and how scientific questions are answered. Some scientific inquiries can only be investigated by the use of models since actual events are not repeatable.

The knowledge and skills related to scientific inquiry enable students to understand how science works, and are powerful ways for students to build their understanding of the scientific facts, principles, concepts, and applications that are described in the other science content standards, particularly standards two, three, and four. To comprehend the world around them, students need opportunities to pursue questions that are relevant to them and to learn how to conduct scientific investigations.

GRADES K-2

In grades K-2, students know and are able to:

1. use their senses to make and describe careful observations
2. ask questions and make predictions
3. conduct simple experiments using tools and technology (for example: computers, thermometers, magnifiers, rulers, balances)
4. record data, report on findings and explain with reasons

GRADES 3-5

In grades 3-5, students know and are able to:

1. design, plan and conduct a variety of simple investigations (for example: formulate a testable question, state a hypothesis, make systematic observations, develop and communicate logical conclusions based on evidence)
2. select and use appropriate tools and technology to gather and display (for example: graphs, charts, diagrams) quantitative and qualitative data related to an investigation (for example: length, volume, and mass measuring instruments, thermometers, watches, magnifiers, microscopes, calculators, and computers)

**GRADES 6-8**

In grades 6-8, students know and are able to:

1. ask questions and state hypotheses that lead to different types of scientific investigations (for example: experimentation, collecting specimens, constructing models, researching scientific literature)

2. use appropriate tools, technologies and metric measurements to gather and organize data and report results

3. interpret and evaluate data in order to formulate logical conclusions

4. demonstrate that scientific ideas are used to explain previous observations and to predict future events (for example: plate tectonics and future earthquake activity)

5. identify and evaluate alternative explanations and procedures

6. communicate results of their investigations in appropriate ways (for example: written reports, graphic displays, oral presentations)

**GRADES 9-12**

In grades 9-12, students know and are able to:

1. ask questions and state hypotheses using prior scientific knowledge to help design and guide their development and implementation of a scientific investigation

2. select and use appropriate technologies to gather, process, and analyze data and to report information related to an investigation

3. identify major sources of error or uncertainty within an investigation (for example: particular measuring devices and experimental procedures)

4. recognize and analyze alternative explanations and models

5. construct and revise scientific explanations and models, using evidence, logic, and experiments that include identifying and controlling variables

6. communicate and evaluate scientific thinking that leads to particular conclusions
STANDARD 2:

Physical Science: Students know and understand common properties, forms, and changes in matter and energy. *(Focus: Physics and Chemistry)*

RATIONALE

Everyone has experience with matter in a variety of forms. Such experiences help build students’ understanding of similarities and differences in the properties of matter. Their personal experiences help students understand common properties such as hardness, strength, color, shapes and states of matter (solid, liquid, gas and plasma). Knowledge of observable properties of matter and its microscopic/macroscopic structure and composition is helpful in considering matter’s varied uses, availability, and limitations in our world.

Energy is a central concept in science because all physical interactions involve changes in energy. Students need to understand that all physical events involve transferring energy, or changing one form of energy into another, such as when forces act on matter producing changes in motion. Knowledge of forms of energy, its transfer and transformation, is essential to interpreting, explaining, predicting, and influencing change in our world.

Interactions between matter and energy account for changes observed in everyday events that are sometimes misunderstood. Understanding how matter and energy interact and are conserved extends students’ knowledge of the physical world, and allows them to monitor and explain a wide variety of changes and to predict future physical and chemical changes.

GRADES K-2

In grades K-2, students know and can demonstrate understanding that:

**Properties of Materials**

1. solids and liquids (matter) can be identified, compared, sorted/classified by their physical properties *(for example: size, shape, texture, flexibility, temperature, color and patterns)*

2. mixtures can be created and separated based on physical properties *(for example: salt and sand, iron filings and soil, oil and water)*

**Position and Motion of Objects**

3. the only way to change the motion of an object is by pushing or pulling on it *(force)*

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GRADES 3-5

In grades 3-5, students know and can demonstrate understanding that:

**Physical Properties**

1. objects have physical properties that can be measured (*for example*: length, mass, volume and temperature)

2. measurable physical properties can be compared before and after effecting a change to verify a change has occurred and used to predict its outcome in similar circumstances

3. matter is made up of parts that are too small to be seen

4. matter exists in physical states (solid, liquid, gas) and can change from one state to another

**Transfer of Energy**

5. there are different types and sources of energy (*for example*: light, heat, motion)

6. electricity in circuits can produce light, heat, sound and magnetic effects

**Forces and Motion**

7. there are different types of forces (*for example*: gravity and magnetism)

8. changes in speed or direction of motion are caused by forces

GRADES 6-8

In grades 6-8, students know and can demonstrate understanding that:

**Properties of Substances**

1. physical properties of solids, liquids, gases and the plasma state and their changes can be explained using the particulate nature of matter model

2. mixtures of substances can be separated based on their properties (*for example*: solubilities, boiling points, magnetic properties, densities and specific heat)

3. mass is conserved in a chemical or physical change

4. mass and weight can be distinguished
Atomic and Molecular Structure

5. all matter is made up of atoms that are comprised of protons, neutrons and electrons and when a substance is made up of only one type of atom it is an element

6. when two or more elements are combined a compound is formed which is made up of molecules

Forces and Motion

7. quantities (for example: time, distance, mass, force) that characterize moving objects and their interactions within a system (for example, force, speed, velocity, potential energy, kinetic energy) can be described, measured and calculated

Forms and Transfer of Energy

8. that there are different forms of energy and those forms of energy can be transferred and stored (for example: kinetic, potential) but total energy is conserved

9. electric circuits provide a means of transferring electrical energy when heat, light, sound, magnetic effects and chemical changes are produced

10. white light is made up of different colors that correspond to different wavelengths

GRADES 9-12

In grades 9-12, students know and can demonstrate understanding that:

Structure and Properties of Matter

1. elements can be organized by their physical and chemical properties (Periodic Table)

2. the spatial configuration of atoms and the structure of the atoms in a molecule determine the chemical properties of the substance

3. there are observable and measurable physical and chemical properties that allow you to compare, contrast, and separate substances (for example: pH, melting point, conductivity, magnetic attraction)

4. word and chemical equations are used to relate observed changes in matter to its composition and structure (for example: conservation of matter)
**Forms and Transfer of Energy**

5. quantitative relationships involved with thermal energy can be identified, measured, calculated and analyzed (*for example: heat transfer in a system involving mass, specific heat, and change in temperature of matter*)

6. energy can be transferred through a variety of mechanisms and in any change some energy is lost as heat (*for example: conduction, convection, radiation, motion, electricity, chemical bonding changes*)

7. light and sound waves have distinct properties; frequency, wavelengths and amplitude

8. quantities that demonstrate conservation of mass and conservation of energy in physical interactions can be measured and calculated

**Forces and Motion**

9. Newton’s Three Laws of Motion explain the relationship between the forces acting on an object, the object’s mass, and changes in its motion
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 environment. *(Focus: Biology--Anatomy, Physiology, Botany, Zoology, Ecology)*

RATIONALE

As a result of their study of a variety of organisms and where they live, students gain a better understanding of their world. Students have a natural curiosity about life and the great diversity of organisms. Their curiosity leads to the study of organisms and how the organisms interact with the world. Through the study of similarities and differences of organisms, students learn the importance of structure and function in the growth and development of organisms. In their future as citizens, students will need to think about and make decisions about the diversity and extinction of organisms in their communities and the world.

From experience, students know that they must eat food to live. As a result of their study of energy transfer and transformation in living organisms, students understand that the Sun is the primary and ultimate source of energy for living organisms. They learn why a constant input of matter and energy is critical for life. Photosynthetic organisms are critical to all organisms and need to be maintained. If one or more components are altered in an ecosystem, all other components are affected. Through studying the interrelationships of organisms, students learn that they can have a critical impact on other organisms.

Students are interested in learning about their bodies and how they relate biologically to other forms of life. The study of structure and function, body organization, growth and development, and maintenance of other organisms enhances students' understanding of human development, health, and disease. Knowledge of these areas can assist students in making informed choices regarding nutrition, exercise and other factors that influence their body functions.

Students study the scientific concept of biological evolution—the changes in populations of organisms through time—in order to understand diversity and relatedness within the living world. Inquiries into evolution explain the ways in which natural processes produce life’s diversity. These studies help students understand that evolution is the major unifying concept in the biological sciences and that it explains a wide variety of observations that can be made about the living world. In particular, students see that the study of evolution initiates questions about biodiversity, adaptation, genetics, mutations, the geological record, and the observed unity at molecular and whole-organism levels. This content standard does not define any student expectations related to the origin of life.

GRADES K-2

In grades K-2, students know and can demonstrate understanding that:

**Characteristics of Organisms**

1. an organism (plant, animal) is a living thing that has physical characteristics that help it to survive
2. offspring have characteristics that are similar to but not exactly like their parents

3. fossil evidence helps identify organisms that once lived on Earth but have completely disappeared (for example: dinosaurs, dodo bird, woolly mammoth and saber tooth tiger)

**Life Cycles of Organisms**

4. there are similarities and differences in growth and development of organisms (for example: insect, plant, mammal)

**Organisms and Environments**

5. organisms interact with each other and with nonliving parts of their habitat to meet their basic needs (for example: food, water, air, shelter, space)

**GRADES 3-5**

In grades 3-5, students know and can demonstrate understanding that:

**Structure and Function in Living Systems**

1. each plant or animal has different structures and behaviors that serve different functions in growth, survival, and reproduction

2. green plants need energy from sunlight and various raw materials to live, and animals consume plants and other organisms to live

3. human body systems have basic structures, functions and needs (for example: digestive, respiratory, circulatory, skeletal, muscular)

**Life Cycles of Organisms**

4. there is interaction and interdependence between and among nonliving and living components of ecosystems (for example: food webs, symbiotic and parasitic relationships, dependence on rainfall, pollination)

5. life cycles vary from organism to organism (for example: frog, chicken, butterfly, radish, bean plant)

**Diversity and Adaptations of Organisms**

6. fossils can be compared to one another and to living organisms according to their similarities and differences

7. there are similarities and differences in appearance among individuals of the same population (for example: size, color, shape)
8. there are similarities and differences between organisms (for example: plants vs. animals, vertebrate vs. invertebrate)

GRADES 6-8

In grades 6-8, students know and can demonstrate understanding that:

Structure and Function in Living Systems

1. classification schemes can be used to understand the structure of organisms

2. human body systems have specific functions and interaction (for example: circulatory and respiratory, muscular and skeletal)

3. there is a differentiation among levels of organization (cells, tissues, and organs) and their roles within the whole organism

4. multicellular organisms have a variety of ways to get food and other matter to their cells (for example: digestion, transport of nutrients by circulatory system)

5. photosynthesis and cellular respiration are basic processes of life (for example, set up a terrarium or aquarium and make changes such as blocking out light)

6. different types of cells have basic structures, components and functions (for example: cell membrane, nucleus, cytoplasm, chloroplast, single-celled organisms in pond water, Elodea, onion cell, human cheek cell)

7. there are noncommunicable conditions and communicable diseases (for example: heart disease and chicken pox)

Populations and Ecosystems

8. there is a flow of energy and matter in an ecosystem (for example: as modeled in a food chain, web, pyramid, decomposition)

Reproduction and Heredity

9. asexual and sexual cell reproduction/division can be differentiated

10. chromosomes and genes play a role in heredity (for example, genes control traits, while chromosomes are made up of many genes)

Biological Evolution

11. changes in environmental conditions can affect the survival of individual organisms, populations, and entire species
12. changes or constancy in groups of organisms over geologic time can be revealed through evidence

13. individual organisms with certain traits are more likely than others to survive and have offspring.

GRADES 9-12

In grades 9-12, students know and can demonstrate understanding that:

**Matter and Energy and Organization in Living Systems**

1. the pattern/process of reproduction and development is specific to different organisms

2. there is a relationship between the processes of photosynthesis and cellular respiration (for example: in terms of energy and products)

3. there is a purpose of synthesis and breakdown of macromolecules in an organism (for example: carbohydrates, lipids, amino acids serve as building blocks of proteins; carbon dioxide and water are the basic materials for building sugars through photosynthesis)

4. energy is used in the maintenance, repair, growth, and production of tissues

5. the human body functions in terms of interacting organ systems composed of specialized structures that maintain or restore health (for example: mechanisms involved in homeostasis [balance], such as feedback in the endocrine system)

**Populations and Ecosystems**

6. changes in an ecosystem can affect biodiversity and biodiversity contributes to an ecosystem's dynamic equilibirum

7. there is a cycling of matter (for example: carbon, nitrogen) and the movement and change of energy through the ecosystem (for example: some energy dissipates as heat as it is transferred through a food web)

8. certain properties of water sustain life (for example: polarity, cohesion, solubility)

**The Cell**

9. cellular organelles have specific functions (for example: the relationship of ribosomes to protein, and the relationship of mitochondria to energy transformation)
10. cell reproduction/division has various processes and purposes (mitosis, meiosis, binary fission)

**Basis of Heredity**

11. DNA has a general structure and function and a role in heredity and protein synthesis (for example: replication of DNA and the role of RNA in protein synthesis)

12. genes serve as the vehicle for genetic continuity and the source of genetic diversity upon which natural selection can act

13. some traits can be inherited while others are due to the interaction of genes and the environment (for example: skin cancer triggered by over-exposure to sunlight or contact with chemical carcinogens)

**Biological Evolution**

14. organisms are classified into a hierarchy of groups and subgroups based on similarities which reflect their evolutionary relationships

15. mutation, natural selection, and reproductive isolation can lead to new species and affect biodiversity

16. an organism’s adaptations (for example, structure, behavior) determine its niche (role) in the environment

17. variation within a population improves the chances that the species will survive under new environmental conditions

18. organisms change over time in terms of biological evolution and genetics
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. (Focus: Geology, Meteorology, Astronomy, Oceanography)

RATIONALE

By studying Earth, its composition, history, and the processes that shape it, students gain a better understanding of the planet on which they live. Life throughout geologic time has been, and continues to be, affected by changes that occur at a varying rate on Earth’s surface. Knowledge of the structure and composition of the Earth provides a basis for understanding the distribution of its resources. Understanding geologic events, such as earthquakes and volcanic eruptions, allows students to evaluate the consequences and predict the impact of future occurrences.

Our Earth's atmosphere is vital to life. The Sun and atmosphere affect every aspect of our lives, including food supply, energy use, transportation, recreation, environmental quality, and human health and safety. Weather-related choices we make range from selecting appropriate clothing to preparing for and responding to hazardous weather. Preparedness and response to weather conditions require knowledge of how energy transfer influences atmospheric changes. The more we know about weather, the greater the chances that we will make informed decisions concerning its impact.

The world’s water is vital to life. Both minor and major changes in Earth’s water can have profound effects on human existence. In order to preserve both the quality and quantity of water for daily living, wise management of water resources is crucial. Knowledge of Earth's oceans is important for an understanding of how they affect weather, climate, and life. Knowing the properties and circulation of water, their influence on weather and climate, and the availability to ecosystems is necessary for understanding its importance to life.

Observing the sky has always fascinated human cultures and civilizations. These observations resulted in the development of ways to measure time and predict natural phenomena, such as eclipses and changing of the seasons. All bodies in space, including Earth, are influenced by forces acting throughout the solar system and the universe. Studying the solar system enhances our understanding of Earth's origins, its place in the universe, and its future. Much of what we know about robotics, telecommunications, satellites, and miniaturized components used in computers and other electronic devices can be attributed to exploration of Earth’s atmosphere and our solar system.

GRADES K-2

In grades K-2, students know and can demonstrate understanding that:

Properties of the Earth’s Materials

1. there are different types of Earth’s materials that come in different shapes and sizes (for example: rocks and soil)
2. there are major features of Earth's surface (for example: mountains, rivers, plains, hills, oceans, plateaus)

3. the Earth’s materials (rocks, soil, water) provide many of the resources that humans use and reuse

Earth’s Weather

4. our activities are affected by the daily weather and changing seasons (for example: types of clothing, travel plans, recreational activity)

Objects in the Sky

5. the Sun is the source of Earth's heat and light

6. objects can be readily observed in the daytime and nighttime sky (for example: the Sun, Moon, stars)

GRADES 3-5

In grades 3-5, students know and can demonstrate understanding that:

Earth’s Composition, Processes and History

1. fossils are evidence of past life

2. natural processes change Earth's surface (for example: weathering, erosion, mountain building, volcanic activity, earthquakes and floods)

3. many of the Earth’s resources can be conserved, recycled and depleted

Weather and Water

4. weather is different from climate

5. most of the Earth’s surface is covered by water, that most of the water is salt water in the oceans, and that fresh water is found in rivers, lakes, underground sources and glaciers

6. water exists on Earth in different states (solid, liquid, gas) and changes from one state to another (for example: evaporation, condensation and precipitation)

Solar System

7. there are basic components of the solar system (for example: Sun, planets, moons)
8. the Earth and Sun provide a diversity of resources (for example: soils, fuels, minerals, medicines and food)

9. the rotation of the Earth on its axis, in relation to the Sun, produces the day-and-night cycle and the orbit of the Earth around the Sun completes one year

**GRADES 6-8**

In grades 6-8, students know and can demonstrate understanding that:

**Earth’s Composition, Processes and History**

1. inter-relationships exist between minerals, rocks, and soils

2. humans use renewable and nonrenewable resources (for example: forests and fossil fuels)

3. natural processes shape the Earth’s surface (for example: landslides, weathering, erosion, mountain building, volcanic activity)

4. major geological events such as earthquakes, volcanic eruptions, and mountain building are associated with plate boundaries and attributed to plate motions

5. fossils are formed and used as evidence to indicate that life has changed through time

6. successive layers of sedimentary rock and the fossils contained within them can be used to confirm age, geologic time, history, and changing life forms of the Earth; this evidence is affected by the folding, breaking and uplifting of layers

**Atmosphere and Weather**

7. the atmosphere has basic composition, properties, and structure (for example: the range and distribution of temperature and pressure in the troposphere and stratosphere)

8. atmospheric circulation is driven by solar heating (for example: the transfer of energy by radiation, convection, conduction)

9. there are quantitative changes in weather conditions over time and space (for example: humidity, temperature, air pressure, cloud cover, wind, precipitation)

10. there are large-scale and local weather systems (for example: fronts, air masses, storms)
Earth’s Water

11. the world’s water is distributed and circulated through oceans, glaciers, rivers, groundwater, and atmosphere

12. the ocean has a certain composition and physical characteristics (for example: currents, waves, features of the ocean floor, salinity, and tides)

Solar System and the Universe

13. there are characteristics (components, composition, size) and scientific theories of origin of the solar system

14. relative motion, axes tilt and positions of the Sun, Earth, and Moon have observable effects (for example: seasons, eclipses, moon phases)

15. the universe consists of many billions of galaxies (each containing many billions of stars) and that vast distances separate these galaxies and stars from one another and from the Earth

16. technology is needed to explore space (for example: telescopes, spectrosopes, spacecraft, life support systems)

GRADES 9-12

In grades 9-12, students know and can demonstrate understanding that:

Earth’s Composition, Processes and History

1. the Earth’s interior has a composition and structure

2. the theory of plate tectonics helps to explain relationships among earthquakes, volcanoes, mid-ocean ridges, and deep-sea trenches

3. the feasibility of predicting and controlling natural events can be evaluated (for example: earthquakes, floods, landslides)

4. there are costs, benefits, and consequences of natural resource exploration, development, and consumption (for example: geosphere, biosphere, hydrosphere, atmosphere and greenhouse gas)

5. there are consequences for the use of renewable and nonrenewable resources

6. evidence is used (for example: fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time (for example: Mount St. Helen’s’ eruption Pangaea, and geologic time)
Atmosphere and Weather

7. the atmosphere has a current structure and composition and has evolved over geologic time (for example: effects of volcanic activity and the change of life forms)

8. energy transferred within the atmosphere influences weather (for example: the role of conduction, radiation, convection, and heat of condensation in clouds, precipitation, winds, storms)

9. weather is caused by differential heating, the spin of the Earth and changes in humidity (air pressure, wind patterns, coriolis effect)

10. there are interrelationships between the circulation of oceans and weather and climate

11. there are factors that may influence weather patterns and climate and their effects within ecosystems (for example: elevation, proximity to oceans, prevailing winds, fossil fuel burning, volcanic eruptions)

Earth’s Water

12. water and other Earth systems interact (for example: the biosphere, lithosphere, and atmosphere)

13. continental water resources are replenished and purified through the hydrologic cycle

Solar System and the Universe

14. gravity governs the motions observed in the solar system and beyond

15. there is electromagnetic radiation produced by the Sun and other stars (for example: X-ray, ultraviolet, visible light, infrared, radio)

16. stars differ from each other in mass, color, temperature and age

17. the scales of size and separation of components of the solar system are complex
STANDARD 5:

Students understand that the nature of science involves a particular way of building knowledge and making meaning of the natural world.

RATIONALE

Human societies have long asked questions about, observed and collected data on, and offered explanations for natural phenomena. Scientific evidence and knowledge are distinguished from other ways of knowing and other bodies of knowledge in terms of the criteria that must be met. These criteria include the use of empirical standards and rules of evidence, a logical structure, rational thought, questioning, and openness to criticism. Scientific disciplines differ from one another in what is studied, techniques and technologies used, and outcomes sought. They share a common purpose -- to explain and predict events and phenomena -- and offer strategies to solve defined problems.

Scientific knowledge is dynamic. Although some scientific theories have withstood the test of time and are still used, other knowledge claims have been altered by new scientific evidence. Change, continuity, and stability are characteristic features of science. Although acquiring scientific knowledge of laws, concepts, and theories is central to learning science, it does not necessarily lead to an understanding of how science itself works. Students need to understand that science works by weaving different aspects of science together so that they reinforce one another. Unifying concepts and processes such as change, systems, models, evolution, equilibrium and form and function bring coherence to seemingly diverse sets of ideas or facts involving natural phenomena. These concepts can encompass and connect large quantities of basic data and evidence in science and can be used to integrate science with other disciplines.

GRADES K-2

In grades K-2, students know and can demonstrate understanding that:

1. basic observable patterns and changes in the world can help to predict future events based on those patterns (for example: seasonal weather patterns, day/night)

GRADES 3-5

1. when a science experiment is repeated with the same conditions, the experiment generally works the same way

2. models are used to represent events and objects (for example: comparing a map of the school to the actual school; a model of the Earth to the Earth itself)

GRADES 6-8

In grades 6-8, students know and can demonstrate understanding that:

1. a controlled experiment must have comparable results when repeated
2. scientific knowledge changes as new knowledge is acquired and previous ideas are modified (for example: through space exploration)

3. contributions to the advancement of science have been made by people in different cultures and at different times in history

4. models can be used to predict change (for example: computer simulation, video sequence, stream table)

5. there are interrelationships among science, technology and human activity that affect the world

**GRADES 9-12**

In grades 9-12, students know and can demonstrate understanding that:

1. print and visual media can be evaluated for scientific evidence, bias, or opinion

2. the scientific way of knowing uses a critique and consensus process (for example: peer review, openness to criticism, logical arguments, skepticism)

3. graphs, equations or other models are used to analyze systems involving change and constancy (for example: comparing the geologic time scale to shorter time frame, exponential growth, a mathematical expression for gas behavior; constructing a closed ecosystem such as an aquarium)

4. there are cause-effect relationships within systems (for example: the effect of temperature on gas volume, effect of carbon dioxide level on the greenhouse effect, effects of changing nutrients at the base of a food pyramid)

5. scientific knowledge changes and accumulates over time; usually the changes that take place are small modifications of prior knowledge but major shifts in the scientific view of how the world works do occur

6. interrelationships among science, technology and human activity lead to further discoveries that impact the world in positive and negative ways

7. there is a difference between a scientific theory and a scientific hypothesis