Subject: Science
Grade: 08
Expectations: 49
Breakouts: 181

(a) Introduction.

1. In Grades 6 through 8 Science, content is organized into recurring strands. The concepts within each grade level build on prior knowledge, prepare students for the next grade level, and establish a foundation for high school courses. In Grade 8, the following concepts will be addressed in each strand.

A. Scientific and engineering practices. Scientific inquiry is the planned and deliberate investigation of the natural world using scientific and engineering practices. Scientific methods of investigation are descriptive, correlative, comparative, or experimental. The method chosen should be appropriate to the grade level and ques1.69.4 (e)3 (s)3.8 ((e)-6

d their populations respond to environmental changes, including those

nal Academy of Sciences, is the "use of evidence to construct testable
a, as well as the knowledge generated through this process." This vast
ribed by physical, mathematical, and conceptual models. Students
ealm of science because they deal with phenomena that are not

3. Scientific observations, inferences, hypotheses, and theories. Students are expected to know that:

    A. observations are active acquisition of either qualitative or quantitative information from a primary source through the senses;

    B. inferences are conclusions reached on the basis of observations or reasoning supported by relevant evidence;

    C. hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power that have been tested over a wide variety of conditions are incorporated into theories; and

    D. scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well established and highly reliable explanations, but they may be sub

(C) use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards;

(i) use appropriate safety equipment during laboratory investigations as outlined in Texas Education Agency-approved safety standards

(ii) identify limitations of models

(B) analyze data by identifying any significant descriptive statistical features, patterns, sources of error, or limitations;

(i) analyze data by identifying any significant descriptive statistical features, patterns, sources of error, or limitations

(C) use mathematical calculations to assess quantitative relationships in data; and

(i) use mathematical calculations to assess quantitative relationships in data

(D) evaluate experimental and engineering designs.

(i) evaluate experimental designs

(ii) evaluate engineering designs

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(A) develop explanations4t(l-1.9 (n)- d1.6 (o o)-2 (p)-1 (n)-[2 (l) 0.002 T(u)-33T(f)1.6 (.5 e)-1 (1 (c)-4.1 (u)-4 (la-j/TT0 1 7)0.5 (m4 (t)-2

(C) engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.

(i) engage respectfully in scientific argumentation using applied scientific explanations

(ii) engage respectfully in scientific argumentation using empirical evidence

(4)

(C) research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

(i) research STEM careers

(ii) explore resources to investigate STEM careers

(5) Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. The student is expected to:

(A) identify and apply patterns to understand and connect scientific phenomena or to design solutions;

(i) identify patterns to understand scientific phenomena or to design solutions

(ii) identify patterns to connect scientific phenomena or to design solutions

(iii) apply patterns to understand scientific phenomena or to design solutions

(iv) apply patterns to connect scientific phenomena or to design solutions

(B) identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;

(i) identify cause-and-effect relationships to explain scientific phenomena or analyze problems

(ii) investigate cause-and-effect relationships to explain scientific phenomena or analyze problems

(C) analyze how differences in scale, proportion, or quantity affect a system's structure or performance;

(i) analyze how differences in scale, proportion, or quantity affect a system's structure or performance

(D) examine and model the parts of a system and their interdependence in the function of the system;

(i) examine the parts of a system

(ii) model the parts of a system

(iii) examine [the parts of a system's] interdependence in the function of the system

(iv) model [the parts of a system's] interdependence in the function of the system

(E) analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems;

(i) analyze how energy flows through systems

(ii) analyze how matter cycles through systems

(iii) analyze how energy [is] conserved through a variety of systems

(iv) analyze how matter [is] conserved through a variety of systems

(v)

(ii) analyze the complementary relationship between the structure and function of organisms

(iii) analyze the complementary relationship between the structure and function of systems

(iv) explain the complementary relationship between the structure and function of objects

(v) explain the complementary relationship between the structure and function of organisms

(vi) explain the complementary relationship between the structure and function of systems

(G) analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

(i) analyze how factors or conditions impact stability in objects

(ii) analyze how factors or conditions impact stability in organisms

(iii) analyze how factors or conditions impact stability in systems

(iv) explain how factors or conditions impact stability in objects

(v) explain how factors or conditions impact stability in organisms

(vi) explain how factors or conditions impact stability in systems

(vii) analyze how factors or conditions impact change in objects

(viii) analyze how factors or conditions impact change in organisms

(ix) analyze how factors or conditions impact change in systems

(x) explain how factors or conditions impact change in objects

(xi) explain how factors or conditions impact change in organisms

(xii) explain how factors or conditions impact change in systems

(6) Matter and energy. The student understands that matter can be classified according to its properties and matter is conserved in chemical changes that occur within closed systems. The student is expected to:

(A) explain by modeling how matter is classified as elements, compounds, homogeneous mixtures, or heterogeneous mixtures;

(i) explain by modeling how matter is classified as elements, compounds, homogeneous mixtures, or heterogeneous mixtures

(B) use the periodic table to identify the atoms involved in chemical reactions;

(i) use the periodic table to identify the atoms involved in chemical reactions

(C) describe the properties of cohesion, adhesion, and surface tension in water and relate to observable phenomena such as the formation of droplets, transport in plants, and insects walking on water;

(i) describe the properties of cohesion in water

(ii) describe the properties of adhesion in water

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(D)

(iii) categorize galaxies as irregular

(iv) locate Earth's solar system within the Milky Way galaxy

(C) research and analyze scientific data used as evidence to develop scientific theories that describe the origin of the universe.

(i) research scientific data used as evidence to develop scientific theories that describe the origin of the universe

(ii) analyze scientific data used as evidence to develop scientific theories that describe the origin of the universe

(10) Earth and space. The student knows that interactions between Earth, ocean, and weather systems impact climate. The student is expected to:

(A) describe how energy from the Sun, hydrosphere, and atmosphere interact and influence weather and climate;

(i) describe how energy from the Sun influence[s] weather

(ii) describe how energy from the Sun influence[s] climate

(iii) describe how energy from the hydrosphere influence[s] weather

(iv) describe how energy from the hydrosphere influence[s] climate

(v) describe how energy from the atmosphere influence[s] weather

(vi) describe how energy from the atmosphere influence[s] climate

(vii) describe how energy from the Sun interacts[s with] weather

(viii) describe how energy from the Sun interact[s with] climate

(ix) describe how energy from the hydrosphere interacts[s with] weather

(x) describe how energy from the hydrosphere interact[s with] climate

(xi) describe how energy from the atmosphere interact[s with] weather

(xii) describe how energy from the atmosphere interact[s with] climate

(B) identify global patterns of atmospheric movement and how they influence local weather; and

(i) identify global patterns of atmospheric movement

(ii) identify how [global patterns of atmospheric movement] influence local weather

(C)

(11) Earth and space. The student knows that natural events and human activity can impact global climate. The student is expected to:

(A) use scientific evidence to describe how natural events, including volcanic eruptions, meteor impacts, abrupt changes in ocean currents, and the release and absorption of greenhouse gases influence climate;

(i) use scientific evidence to describe how natural events, including volcanic eruptions influence climate

(ii) use scientific evidence to describe how natural events, including meteor impacts influence climate

(iii) use scientific evidence to describe how natural events, including abrupt changes in ocean currents influence climate

(iv) use scientific evidence to describe how natural events, including the release and absorption of greenhouse gases influence climate

(B) use scientific evidence to describe how human activities, including the release of greenhouse gases, deforestation, and urbanization, can influence climate; and

(i) use scientific evidence to describe how human activities, including the release of greenhouse gases, can influence climate

(ii) use scientific evidence to describe how human activities, including deforestation, can influence climate

(iii) use scientific evidence to describe how human activities, including urbanization, can influence climate

(C) describe the carbon cycle.

(i) describe the carbon cycle

(12) Organisms and environments. The student understands stability and change in populations and ecosystems. The student is expected to:

(A) explain how disruptions such as population changes, natural disasters, and human intervention impact the transfer of energy in food webs in ecosystems;

(i) explain how disruptions impact the transfer of energy in food webs in ecosystems

(B) describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity; and

(i) describe how primary ecological succession affect[s] populations after ecosystems are disrupted by natural events or human activity

(ii)

(13) Organisms and environments. The student knows how cell functions support the health of an organism and how adaptation and variation relate to survival. The student is expected to:

(A) identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells;

(i) identify the function of the cell membrane in plant or animal cells

(ii) identify the function of the cell wall in plant or animal cells

(iii) identify the function of the nucleus in plant or animal cells

(iv) identify the function of the ribosomes in plant or animal cells

(v) identify the function of the cytoplasm in plant or animal cells

(vi) identify the function of the mitochondria in plant or animal cells

(vii) identify the function of the chloroplasts in plant or animal cells

(viii) identify the function of the vacuoles in plant or animal cells

(B) describe the function of gene 1h 7 1.7 ( )0.5wc6 ( )0.5 (3.6 ( )0.5 (n)6 ( )m)1186 0 Td i3 susi9Tc 0464fiii 3 ii7.0.5 (o)2 (f)1.6 (7.