Pagthe follow concepts will be addressed in each strand.

A. Scientific and engineering practices. Scientific inquiry is the planned and deliberate investigation of the natural

2. Nature of science. Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not currently scientifically testable.

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 subject to change as new areas of science and new technologies are developed.

4. Science and social ethics. Scientific decision making is a way of answering questions about the natural world involving its

(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) explain how energy flows through systems

(vi) explain how matter cycles through systems

(vii) explain how energy [is] conserved through a variety of systems

(viii) explain how matter [is] conserved through a variety of systems

(F) analyze and explain the complementary relationship between structure and function of objects, organisms, and systems; and

(i) analyze the complementary relationship between structure and function of objects

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

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

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

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

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

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(i) describe aqueous solutions in terms of solute

(ii) describe aqueous solutions in terms of solvent

(iii) describe aqueous solutions in terms of concentration

(iv) describe aqueous solutions in terms of dilution

(E) investigate and model how temperature, surface area, and agitation affect the rate of dissolution of solid solutes in aqueous solutions.

(i) investigate how temperature affect[s] the rate of dissolution of solid solutes in aqueous solutions

(ii) investigate how surface area affect[s] the rate of dissolution of solid solutes in aqueous solutions

(iii) investigate how agitation affect[s] the rate of dissolution of solid solutes in aqueous solutions

(iv) model how teow2.94 modt//TTmnsli.,7t38 0 Td(M5 (g)-2.(m)2.)0.5 rts ds m soluns in aqueou479(us)3.8 (s)3.8 solu

(ii) investigate how the rate of heat energy transfer by a system, including conversion

(xx) describe the movements of the meteors

(xxi) describe the movements of the asteroids

(xxii) describe the movements of the comets

(xxiii)

(xxi) model the main functions of the systems of the human organism, including the immune system

(xxii) model the main functions of the systems of the human organism, including the endocrine systems

(B) describe the hie