

READINESS STANDARDS - Grade 8 Science

(8.5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to

(A) describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud	Protons, Neutrons, Electrons, Electron cloud, Nucleus
(B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity	Protons, Valence electrons, Chemical properties, Reactivity
(C) interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements	Periodic Table, Groups, Families, Periods, Metals, Nonmetals, Metalloids, Transition metals
(D) recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts	Chemical formulas, Substances, Subscripts
(E) investigate how evidence of chemical reactions indicate that new substances with different properties are formed	Chemical reaction, Precipitant

(8.6) Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to

(A) demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion	Unbalanced forces, Speed, Velocity, Newtons
(C) investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches	Inertia, Acceleration, Velocity, Newton's laws, Law of inertia, Law of force and acceleration, Law of action-reaction

(8.7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to

(A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons	Rotation, Revolution, Orbit, Tilt, Axis, Hemisphere
(B) demonstrate and predict the sequence of events in the lunar cycle	Lunar cycle, Orbits, Solar eclipse, Lunar eclipse, Waxing Crescent, Waxing Gibbous, Waning Gibbous, Waning Crescent, Quarter, Hemisphere, Solar eclipse, Lunar eclipse

(8.8) Earth and space. The student knows characteristics of the universe. The student is expected

(A) describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification	Stars, Life cycle, Nebulae, Galaxy, Elliptical, Spiral, Irregular, Hertzsprung-Russell diagram
--	--

READINESS STANDARDS - Grade 8 Science

(8.9) **Earth and space.** The student knows that natural events can impact Earth systems. The student is expected to

(B) relate plate tectonics to the formation of crustal features

Plate tectonics, Lithosphere, Asthenosphere, Continental drift, Oceanic trench, Convergent, Divergent, Subduction, Pangea

(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering

Topographic maps, Canyons, Deltas, Mountains, Weathering

(8.11) **Organisms and environments.** The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. The student is expected to

(A) describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems

Producer, Consumer, Predator, Prey, Parasite, Host, Food webs, Ecosystem

(B) investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water, range of temperatures, or soil composition

Populations, Biotic, Abiotic, Ecosystem, Competition

(C) explore how short-and long-term environmental changes affect organisms and traits in subsequent populations

Natural selection, Adaptations, Biodiversity, Ecological succession

SUPPORTING STANDARDS - Grade 8 Science

(8.5) **Matter and energy.** The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to

(F) recognize whether a chemical equation containing coefficients is balanced or not and how that relates to the law of conservation of mass

Chemical equation, Balanced equation, Coefficients, Law of conservation of mass

(8.6) **Force, motion, and energy.** The student knows that there is a relationship between force, motion, and energy. The student is expected to

(B) differentiate between speed, velocity, and acceleration

Speed, Velocity, Acceleration

(6.8) **Force, motion, and energy.** The student knows that there is a relationship between force, motion, and energy. The student is expected to

(C) calculate average speed using distance and time measurements

Average speed, Speed, Velocity

(D) measure and graph changes in motion

Speed, Time, Distance, Acceleration

(8.7) **Earth and space.** The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to

(C) relate the position of the Moon and Sun to their effect on ocean tides

Ocean tides, Lunar cycle, High tide, Low tide, Gravity

SUPPORTING STANDARDS - Grade 8 Science

(8.8) **Earth and space.** The student knows characteristics of the universe. The student is expected to

(B) recognize that the Sun is a medium-sized star near the edge of a disc-shaped galaxy of stars and that the Sun is many thousands of times closer to Earth than any other star

Sun, Star, Galaxy

(C) explore how different wavelengths of the electromagnetic spectrum such as light and radio waves are used to gain information about distances and properties of components in the universe

Wavelengths, Frequency, Light waves, Radio waves, Electromagnetic spectrum

(D) model and describe how light years are used to measure distances and sizes in the universe

Light years, Speed of light

(8.9) **Earth and space.** The student knows that natural events can impact Earth systems. The student is expected to

(A) describe the historical development of evidence that supports plate tectonic theory

Plate tectonics, Pangaea, Fault lines, Continental drift

(8.10) **Earth and space.** The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to

(A) recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds and ocean currents

Convection currents, Ocean currents, Jet stream, Gyres, Gulf stream

(B) identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts

High and low pressure, Fronts, Jet stream

(C) identify the role of the oceans in the formation of weather systems such as hurricanes

Weather patterns – La Niña, El Niño, Hurricanes. Tsunami, Air mass, Ocean currents

(8.11) **Organisms and environments.** The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. The student is expected to

(D) recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems

Runoff, Artificial reefs, Dependence, Resources

(6.5) **Matter and energy.** The student knows the differences between elements and compounds. The student is expected to

(C) differentiate between elements and compounds on the most basic level

Elements, Compounds

(6.6) **Matter and energy.** The student knows matter has physical properties that can be used for classification. The student is expected to

(A) compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability

Metals, Nonmetals, Metalloids, Luster, Conductivity, Malleability

(B) calculate density to identify an unknown substance

Density, Substance, Mass, Volume, Water displacement

SUPPORTING STANDARDS - Grade 8 Science

(6.8) **Force, motion, and energy.** The student knows force and motion are related to potential and kinetic energy. The student is expected to

(A) compare and contrast potential and kinetic energy

Potential energy, Kinetic energy

(6.9) **Force, motion, and energy.** The student knows that the Law of Conservation of Energy states that energy can neither be created nor destroyed, it just changes form. The student is expected to

(C) demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy

Energy transformation, Chemical energy, Electrical energy, Mechanical energy

(6.11) **Earth and space.** The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to

(B) understand that gravity is the force that governs the motion of our solar system

Gravity, Force, Solar system

(6.12) **Organisms and environments.** The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to

(D) identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms

Prokaryotic, Eukaryotic, Unicellular, Multicellular, Autotrophic, Heterotrophic

(7.5) **Matter and energy.** The student knows that interactions occur between matter and energy. The student is expected to

(C) diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids

Food webs, Food chains, Energy Pyramids

(7.6) **Matter and energy.** The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. The student is expected to

(A) identify that organic compounds contain carbon and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur

Organic compounds, Elements, Carbon

(B) distinguish between physical and chemical changes in matter in the digestive system

Physical changes, Chemical changes, Digestive system

(7.7) **Force, motion, and energy.** The student knows that there is a relationship among force, motion, and energy. The student is expected to

(A) contrast situations where work is done with different amounts of force to situations where no work is done such as moving a box with a ramp and without a ramp, or standing still

Work

(7.8) **Earth and space.** The student knows that natural events and human activity can impact Earth systems. The student is expected to

(C) model the effects of human activity on groundwater and surface water in a watershed

Ground water, Surface water, Watershed

SUPPORTING STANDARDS - Grade 8 Science

(7.10) **Organisms and environments.** The student knows that there is a relationship between organisms and the environment. The student is expected to

(B) describe how biodiversity contributes to the sustainability of an ecosystem

Biodiversity, Sustainability

(C) observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds

Ecological succession, Primary succession, Secondary succession, Climax communities

(7.11) **Organisms and environments.** The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. The student is expected to

(A) examine organisms or their structures such as insects or leaves and use dichotomous keys for identification

Dichotomous key

(C) identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals

Traits, Natural selection, Selective breeding

(7.12) **Organisms and environments.** The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. The student is expected to

(B) identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems

Circulatory, Respiratory, Skeletal, Muscular, Digestive, Excretory, Reproductive, Integumentary, Nervous, Endocrine systems

(D) differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole

Cell organelles, Cell membrane, Cell wall, Nucleus, Cytoplasm, Mitochondrion, Chloroplast, Vacuole

(F) recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life

Cell theory

(7.14) **Organisms and environments.** The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. The student is expected to

(B) compare the results of uniform or diverse off spring from sexual reproduction or asexual reproduction

Sexual reproduction, Asexual reproduction

(C) recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus

Genes, Chromosomes, Nucleus, Traits