

TEKs For Kimmel Lecture Tracking Tornadoes

Kindergarden

(K.4) **Scientific processes.** The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described, and measured. The student is expected to:

(A) identify and use senses as tools of observation.

(K.5) **Science concepts.** The student knows that organisms, objects, and events have properties and patterns. The student is expected to:

(B) observe and identify patterns including seasons, growth, and day and night and predict what happens next; and

(C) recognize and copy patterns seen in charts and graphs.

(K.6) **Science concepts.** The student knows that systems have parts and are composed of organisms and objects. The student is expected to:

(D) identify parts that, when separated from the whole, may result in the part or the whole not working, such as cars without wheels and plants without roots

(K.7) **Science concepts.** The student knows that many types of change occur. The student is expected to:

(A) observe, describe, and record changes in size, mass, color, position, quantity, time, temperature, sound, and movement;

(B) identify that heat causes change, such as ice melting or the Sun warming the air and compare objects according to temperature; and

(C) observe and record weather changes from day to day and over seasons.

First Grade

(1.4) **Scientific processes.** The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described, and measured. The student is expected to:

(B) record and compare collected information

(1.5) **Science concepts.** The student knows that organisms, objects, and events have properties and patterns. The student is expected to:

(A) sort objects and events based on properties and patterns; and

(B) identify, predict, and create patterns including those seen in charts, graphs, and numbers.

(1.7) **Science concepts.** The student knows that many types of change occur. The student is expected to:

(A) observe, measure, and record changes in size, mass, color, position, quantity, sound, and movement;

(B) identify and test ways that heat may cause change such as when ice melts; and

(C) observe and record changes in weather from day to day and over seasons.

Second Grade

(2.5) **Science concepts.** The student knows that organisms, objects, and events have properties and patterns. The student is expected to:

(B) identify, predict, replicate, and create patterns including those seen in charts, graphs, and numbers.

(2.7) **Science concepts.** The student knows that many types of change occur. The student is expected to:

(A) observe, measure, record, analyze, predict, and illustrate changes in size, mass, temperature, color, position, quantity, sound, and movement;

(B) identify, predict, and test uses of heat to cause change such as melting and evaporation; and

(D) observe, measure, and record changes in weather, the night sky, and seasons.

Third Grade

(3.4) **Scientific processes.** The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:

(B) demonstrate that repeated investigations may increase the reliability of results.

(3.5) **Science concepts.** The student knows that systems exist in the world. The student is expected to:

(A) observe and identify simple systems such as a sprouted seed and a wooden toy car; and

(B) observe a simple system and describe the role of various parts such as a yo-yo and string.

(3.6) **Science concepts.** The student knows that forces cause change. The student is expected to:

- (A) measure and record changes in the position and direction of the motion of an object to which a force such as a push or pull has been applied; and
 - (B) identify that the surface of the Earth can be changed by forces such as earthquakes and glaciers.
- (3.7) **Science concepts.** The student knows that matter has physical properties. The student is expected to:
- (B) identify matter as liquids, solids, and gases.

Fourth Grade

- (4.4) **Scientific processes.** The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
- (B) demonstrate that repeated investigations may increase the reliability of results.
- (4.5) **Science concepts.** The student knows that complex systems may not work if some parts are removed. The student is expected to:
- (B) predict and draw conclusions about what happens when part of a system is removed.
- (4.6) **Science concepts.** The student knows that change can create recognizable patterns. The student is expected to:
- (A) identify patterns of change such as in weather, metamorphosis, and objects in the sky;
 - (B) illustrate that certain characteristics of an object can remain constant even when the object is rotated like a spinning top, translated like a skater moving in a straight line, or reflected on a smooth surface; and
 - (C) use reflections to verify that a natural object has symmetry.
- (4.7) **Science concepts.** The student knows that matter has physical properties. The student is expected to:
- (A) observe and record changes in the states of matter caused by the addition or reduction of heat.

Fifth Grade

- (5.4) **Scientific processes.** The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
- (B) demonstrate that repeated investigations may increase the reliability of results.
- (5.5) **Science concepts.** The student knows that a system is a collection of cycles, structures, and processes that interact. The student is expected to:

(A) describe some cycles, structures, and processes that are found in a simple system; and

(B) describe some interactions that occur in a simple system.

(5.6) **Science concepts.** The student knows that some change occurs in cycles. The student is expected to:

(A) identify events and describe changes that occur on a regular basis such as in

daily, weekly, lunar, and seasonal cycles;

(5.7) **Science concepts.** The student knows that matter has physical properties. The student is expected to:

(A) classify matter based on its physical properties including magnetism, physical state, and the ability to conduct or insulate heat, electricity, and sound;

Sixth Grade

(6.4) **Scientific processes.** The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:

(B) identify patterns in collected information using percent, average, range, and frequency.

(6.5) **Scientific concepts.** The student knows that systems may combine with other systems to form a larger system. The student is expected to:

(A) identify and describe a system that results from the combination of two or more systems such as in the solar system; and

(B) describe how the properties of a system are different from the properties of its parts.

(6.6) **Science concepts.** The student knows that there is a relationship between force and motion. The student is expected to:

(A) identify and describe the changes in position, direction of motion, and speed of an object when acted upon by force; and

(B) demonstrate that changes in motion can be measured and graphically represented.

(6.7) **Science concepts.** The student knows that substances have physical and chemical properties. The student is expected to:

(A) demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substances; and

(B) classify substances by their physical and chemical properties.

(6.14) **Science concepts.** The student knows the structures and functions of Earth systems. The student is expected to:

- (C) describe components of the atmosphere, including oxygen, nitrogen, and water vapor, and identify the role of atmospheric movement in weather change.

Seventh Grade

(7.4) **Scientific processes.** The student knows how to use tools and methods to conduct science inquiry. The student is expected to:

- (A) collect and analyze information to recognize patterns such as rates of change.

(7.5) **Science concepts.** The student knows that an equilibrium of a system may change. The student is expected to:

- (A) describe how systems may reach an equilibrium such as when a volcano erupts; and
- (B) observe and describe the role of ecological succession in maintaining an equilibrium in an ecosystem.

(7.7) **Science concepts.** The student knows that substances have physical and chemical properties. The student is expected to:

- (A) identify and demonstrate everyday examples of chemical phenomena such as rusting and tarnishing of metals and burning of wood;

(7.14) **Science concepts.** The student knows that natural events and human activity can alter Earth systems. The student is expected to:

- (A) describe and predict the impact of different catastrophic events on the Earth;

Eight Grade

(8.4) **Scientific processes.** The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:

- (B) extrapolate from collected information to make predictions.

(8.5) **Scientific processes.** The student knows that relationships exist between science and technology. The student is expected to:

- (A) identify a design problem and propose a solution;
- (B) design and test a model to solve the problem; and
- (C) evaluate the model and make recommendations for improving the model.

(8.7) **Science concepts.** The student knows that there is a relationship between force and motion. The student is expected to:

(A) demonstrate how unbalanced forces cause changes in the speed or direction of an object's motion.

(8.9) **Science concepts.** The student knows that substances have chemical and physical properties. The student is expected to:

(A) demonstrate that substances may react chemically to form new substances.

(8.11) **Science concepts.** The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:

(A) identify that change in environmental conditions can affect the survival of individuals and of species.

Chemistry

(4) **Science concepts.** The student knows the characteristics of matter. The student is expected to:

(A) differentiate between physical and chemical properties of matter; and

(B) analyze examples of solids, liquids, and gases to determine their compressibility, structure, motion of particles, shape, and volume.

(5) **Science concepts.** The student knows that energy transformations occur during physical or chemical changes in matter. The student is expected to:

(A) identify changes in matter, determine the nature of the change, and examine the forms of energy involved;

(B) identify and measure energy transformations and exchanges involved in chemical reactions; and

(C) measure the effects of the gain or loss of heat energy on the properties of solids, liquids, and gases.

(7) **Science concepts.** The student knows the variables that influence the behavior of gases. The student is expected to:

(A) describe interrelationships among temperature, particle number, pressure, and volume of gases contained within a closed system; and

(B) illustrate the data obtained from investigations with gases in a closed system and determine if the data are consistent with the Universal Gas Law.

(15) **Science concepts.** The student knows factors involved in chemical reactions. The student is expected to:

- (A) verify the law of conservation of energy by evaluating the energy exchange that occurs as a consequence of a chemical reaction; and
- (B) relate the rate of a chemical reaction to temperature, concentration, surface area, and presence of a catalyst.

Environmental Science

(8) **Science concepts.** The student knows that environments change. The student is expected to:

- (A) analyze and describe the effects on environments of events such as fires, hurricanes, deforestation, mining, population growth, and municipal development;
- (B) explain how regional changes in the environment may have a global effect;
- (C) describe how communities have restored an ecosystem; and
- (D) examine and describe a habitat restoration or protection program.

Geology, Meteorology, and Oceanography

(12) **Science concepts.** The student knows the characteristics of the atmosphere. The student is expected to:

- (A) identify the atmosphere as a mixture of gases, water vapor, and particulate matter;
- (B) analyze the range of atmospheric conditions that organisms will tolerate including types of gases, temperature, particulate matter, and moisture; and
- (C) determine the impact on the atmosphere of natural events and human activity.

(13) **Science concepts.** The student knows the role of energy in governing weather and climate. The student is expected to:

- (A) describe the transfer of heat energy at the boundaries between the atmosphere, land masses, and oceans resulting in layers of different temperatures and densities in both the ocean and atmosphere;
- (B) identify, describe, and compare climatic zones; and
- (C) describe the effects of phenomena such as El Niño and the Jet Stream on local weather.

Physics

(5) **Science concepts.** The student knows that changes occur within a physical system and recognizes that energy and momentum are conserved. The student is expected to:

(A) interpret evidence for the work-energy theorem;

and

(B) observe and describe examples of kinetic and potential energy and their transformations.

Physics and Chemistry

(6) **Science concepts.** The student knows the impact of energy transformations in everyday life. The student is expected to:

(A) describe the law of conservation of energy; and

(H) analyze the effects of heating and cooling processes in systems such as weather, living, and mechanical.

(8) **Science concepts.** The student knows that changes in matter affect everyday life. The student is expected to:

(A) distinguish between physical and chemical changes in matter such as oxidation, digestion, changes in states, and stages in the rock cycle; and

(E) research and describe the environmental and economic impact of the end-products of chemical reactions.

Compiled by Lisa Hatzky