ARIZONA SCIENCE TEST

Science Grade Band 6-8
Standards

Standard	Standard Description	SEP	CCC	Domain PLD Level 1	Domain PLD Level 2	Domain PLD Level 3	Domain PLD Level 4
6.P1U1.1	Analyze and interpret data to show that changes in states of matter are caused by different rates of movement of atoms in solids, liquids, and gases (Kinetic Theory).	DATA	PAT; SPQ; SYS; E/M	identify the different particle motion in states of matter	differentiate particle motion in different states of matter	demonstrate that changes in state of matter are due to different rates of particle motion	evaluate result of change in particle motion to state of matter
6.P1U1.2	Plan and carry out an investigation to demonstrate that variations in temperature and/or pressure affect changes in state of matter.	INV	PAT; SPQ; SYS; E/M	identify changes in temperature and/or pressure in matter	differentiate states of matter due to changes in temperature and/or pressure	demonstrate that variations in temperature and/or pressure affect states of matter	predict changes in states of matter due to changes in temperature and/or pressure
6.P1U1.3	Develop and use models to represent that matter is made up of smaller particles called atoms.	MOD	PAT; SPQ; SYS; E/M	identify atoms as basic units of matter	associate different properties to atomic makeup	demonstrate that matter is made up of particles called atoms	critique models demonstrating that matter is made up of atoms

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6.P2U1.4	Develop and use a model to predict how forces act on objects at a distance.	MOD	PAT; SPQ; SYS; E/M	identify forces that act at a distance	differentiate how forces at a distance affect objects	predict how forces acting at a distance affect objects	evaluate predictions of effects of force acting on objects at a distance
6.P4U2.5	Analyze how humans use technology to store (potential) and/or use (kinetic) energy.	DATA	PAT; SPQ; SYS; E/M	categorize methods of energy storage or use of potential and kinetic energy	differentiate storage of potential energy and uses of kinetic energy	demonstrate how humans use technology to store potential energy and use kinetic energy	evaluate methods of energy storage and uses of kinetic energy recommend solutions regarding technology solutions for energy storage or use of kinetic energy
6.E1U1.6	Investigate and construct an explanation demonstrating that radiation from the Sun provides energy and is absorbed to warm the Earth's surface and atmosphere.	INV; E/S	PAT; SPQ; SYS; E/M	identify radiation from the sun as the cause of the warming of Earth's surface and atmosphere	distinguish how radiation from the sun is absorbed by different layers of Earth's surface and atmosphere	show that external radiation from the sun is captured in Earth's surface and atmosphere, providing warmth	evaluate how Earth's layers and atmosphere capture thermal energy

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6.E2U1.7	Use ratios and proportions to analyze and interpret data related to scale, properties, and relationships among objects in our solar system.	DATA	PAT; SPQ; SYS; E/M	identify the spatial relationship between objects in the solar system	make observations about the scale, properties, or relationships of objects in the solar system	classify objects in the solar system based on scale, properties, or relationships	evaluate classification of objects in the solar system based on scale, properties, or relationships to demonstrate phenomena in the solar system
6.E2U1.8	Develop and use models to explain how constellations and other night sky patterns appear to move due to Earth's rotation and revolution.	MOD	PAT; SPQ; SYS; E/M	differentiate between rotation and revolution	distinguish different positions of night sky patterns due to Earth's position	demonstrate why night sky patterns have apparent motion	predict location of night sky patterns due to Earth's revolution
6.E2U1.9	Develop and use models to construct an explanation of how eclipses, moon phases, and tides occur within the Sun-Earth-Moon system.	MOD; E/S	PAT; SPQ; SYS; E/M	identify moon phases, eclipses, and tides	make observations about specific moon phases, eclipses, and tides	demonstrate how moon phases, eclipses, and tides occur	determine the probability of the occurrence of specific tides or eclipses during a specific phase of the moon

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6.E2U1.10	Use a model to show how the tilt of Earth's axis causes variations in the length of the day and gives rise to seasons.	MOD	PAT; SPQ; SYS; E/M	correlate the tilt of Earth's axis with the amount of sunlight it receives	distinguish seasons on Earth due to the tilt of Earth's axis	demonstrate that Earth's tilted axis causes changes in seasons and the amount of daylight	predict possible impacts of a change in Earth's tilted axis, rotation, or revolution
6.L2U3.11	Use evidence to construct an argument regarding the impact of human activities on the environment and how they positively and negatively affect the competition for energy and resources in ecosystems.	EARG	PAT; SPQ; SYS; E/M	identify human activities that impact the environment	distinguish human activities that impact the environment and affect competition for energy and resources	demonstrate how human activities impact the environment and affect competition for energy and resources	evaluate explanations of how human activities impact the environment and affect competition for energy and resources
6.L2U3.12	Engage in argument from evidence to support a claim about the factors that cause species to change and how humans can impact those factors.	ARG	PAT; SPQ; SYS; E/M	identify factors that cause change in species	describe factors that can cause a change in species	demonstrate how human activities impact the factors that cause species to change	predict how a change in human activities would impact the factors that cause a change in species

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6.L2U1.13	Develop and use models to demonstrate the interdependence of organisms and their environment including biotic and abiotic factors.	MOD	PAT; SPQ; SYS; E/M	identify biotic and abiotic factors in the environment	demonstrate how organisms depend on the environment, including biotic and abiotic factors	demonstrate the interdependence of organisms and their environment, including biotic and abiotic factors	predict how a change in a biotic and abiotic factor would affect organisms and their environment
6.L2U1.14	Construct a model that shows the cycling of matter and flow of energy in ecosystems.	MOD	PAT; SPQ; SYS; E/M	identify the matter and energy that cycles in an ecosystem	use a model to distinguish how matter is cycled and energy flows in an ecosystem	demonstrate the cycling of matter and the flow of energy in an ecosystem	evaluate effects of changes in cycling of matter and flow of energy in ecosystems
7.P2U1.1	Collect and analyze data demonstrating how electromagnetic forces can be attractive or repulsive and can vary in strength.	DATA	PAT; C/E; S/F	identify effects of electromagnetic forces	differentiate repulsive from attractive magnetic forces	demonstrate magnetic forces can repel or attract and can vary in strength	evaluate nature of magnetic force and how strength varies at a distance
7.P2U1.2	Develop and use a model to predict how forces act on objects at a distance.	MOD	PAT; C/E; S/F	identify forces that act at a distance	differentiate how forces at a distance affect objects	predict how forces acting a distance affect objects	evaluate predictions of effects of force acting on objects at a distance

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7.P3U1.3	Plan and carry out an investigation that can support an evidence-based explanation of how objects on Earth are affected by gravitational force.	INV; E/S	PAT; C/E; S/F	identify the components of gravitational force	identify that there is a relationship between mass, gravity, and distance	demonstrate how objects on Earth are affected by gravitational force	predict how objects on Earth are affected by gravity evaluate how changes in mass and distance affect gravitational forces on objects
7.P3U1.4	Use non-algebraic mathematics and computational thinking to explain Newton's laws of motion.	MCT	PAT; SPQ; SYS; E/M	identify concepts of Newton's laws of motion	demonstrate concepts of Newton's laws of motion	apply concepts of Newton's laws of motion	evaluate concepts of Newton's laws of motion
7.E1U1.5	Construct a model that shows the cycling of matter and flow of energy in the atmosphere, hydrosphere, and geosphere.	MOD	PAT; C/E; S/F	identify the components of Earth's atmosphere, hydrosphere, and geosphere that cycle matter	differentiate components of Earth's atmosphere, hydrosphere, and geosphere where energy flows and matter is cycled	demonstrate how matter cycles and energy flows within Earth's atmosphere, hydrosphere, and geosphere	evaluate how energy flows and matter is cycled in Earth's atmosphere, hydrosphere, and geosphere

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7.E1U1.6	Construct a model to explain how the distribution of fossils and rocks, continental shapes, and seafloor structures provides evidence of the past plate motions.	MOD	PAT; C/E; S/F	identify structures to provide evidence of plate motions	select evidence that can be used to show past plate motions	demonstrate how past plate motions can be determined with available evidence	evaluate evidence used to determine past motion of plates
7.E1U2.7	Analyze and interpret data to construct an explanation for how advances in technology has improved weather prediction.	DATA; E/S	PAT; C/E; S/F	identify different types of technology used in weather prediction	examine types of technology used in weather prediction	demonstrate how advances in technology have improved weather prediction	design a solution to improve technology in weather prediction

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7.L1U1.8	Obtain, evaluate, and communicate information to provide evidence that all living things are made of cells, cells come from existing cells, and cells are the basic structural and functional unit of all living things.	INFO	PAT; C/E; S/F	identify cells as the basis of all living things	distinguish components of cell theory	synthesize evidence to support the explanation of cell theory	evaluate evidence of cell theory
7.L1U1.9	Construct an explanation to demonstrate the relationship between major cell structures and cell functions (plant and animal).	E/S	PAT; C/E; S/F	identify plant and animal cells	differentiate between components of plant and animal cells and their functions	demonstrate the relationship between structure and function in cells of plants and animals	predict how a change in structure affects function of plant or animal cells to reestablish internal stability (based on changes in external factors)
7.L1U1.10	Develop and use a model to explain how cells, tissues, and organ systems maintain life (animals).	MOD	PAT; C/E; S/F	identify animal cells, tissues, and organs	differentiate between animal cells, tissues, and organs and their functions	demonstrate how animal cells, tissues, and organ systems are organized and interact to maintain life	predict how animal cells, tissues, and organs will maintain life

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7.L1U1.11	Construct an explanation for how organisms maintain internal stability and evaluate the effect of the external factors on organisms' internal stability.	E/S	PAT; C/E; S/F	identify external factors affecting an organism's internal stability	differentiate an organism that is in a state of internal stability from an organism that is not	demonstrate how equilibrium is maintained and evaluate the effect of external factors on internal stability	predict how an external factor will affect the ability of an organism to maintain homeostasis
7.L2U1.12	Construct an explanation for how some plant cells convert light energy into food energy.	E/S	PAT; C/E; S/F	identify which plant cells can convert light energy to food energy	identify the products and reactants in the process of converting light energy to food energy (photosynthesis) in some plant cells	demonstrate how some plant cells convert light energy into food energy (photosynthesis)	demonstrate how the process to convert light energy into food energy (photosynthesis) can be impacted by a change in biotic or abiotic factors

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8.P1U1.1	Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved.	MOD	C/E; E/M; S/C	determine whether a chemical reaction has occurred based on the rearrangement of particles	show rearrangement of particles in chemical reactions	demonstrate that matter is conserved in chemical reactions	predict the outcome of the rearrangement of particles in chemical reactions with regard to conservation of matter
8.P1U1.2	Obtain and evaluate information regarding how scientists identify substances based on unique physical and chemical properties.	INFO	C/E; E/M; S/C	identify unique physical and chemical properties of substances	differentiate chemical from physical properties of substances	identify substances based on unique chemical and physical properties	predict types of properties used to distinguish different substances
8.P4U1.3	Construct an explanation on how energy can be transferred from one energy store to another.	E/S	C/E; E/M; S/C	identify energy transfers	distinguish types of energy transfers	demonstrate how energy is transferred	evaluate or revise explanations of energy transfer methods

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8.P4U1.4	Develop and use mathematical models to explain wave characteristics and interactions.	MOD; MCT	C/E; E/M; S/C	identify when waves occur	identify wave characteristics and interactions	describe wave characteristics and interactions	use, revise, or evaluate explanations of wave characteristics or interactions predict the impact of wave characteristics when the amount of energy in the system is changed
8.P4U2.5	Develop a solution to increase efficiency when transferring energy from one source to another.	E/S	C/E; E/M; S/C	identify efficiency in energy transfers	differentiate between the levels of efficiency in energy transfer	describe a solution that leads to increases in efficiency of energy transfer	evaluate solutions leading to increases in efficiency of energy transfer
8.E1U1.6	Analyze and interpret data about the Earth's geological column to communicate relative ages of rock layers and fossils.	DATA; INFO	C/E; E/M; S/C	identify methods to determine relative age of rock layers	examine how rock layers and fossils can be useful in determining relative age	demonstrate how data from Earth's geological column can be used to communicate the relative ages of rock layers and fossils	evaluate methods of determining relative age

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8.E1U3.7	Obtain, evaluate, and communicate information about data and historical patterns to predict natural hazards and other geological events.	INFO	C/E; E/M; S/C	identify how data is collected for natural hazards and geologic events	recognize that there are patterns in data that can be used to predict future natural hazards and geologic events	synthesize information about data and historical patterns to predict natural hazards and other geological events	predict the likelihood of natural hazards and other geological events based on data and historical patterns
8.E1U3.8	Construct and support an argument about how human consumption of limited resources impacts the biosphere.	ARG	C/E; E/M; S/C	identify types of human consumption that impact the biosphere	differentiate between the consumption of limited and unlimited resources	demonstrate how human consumption of limited resources affects the biosphere	predict effects on the biosphere due to human consumption of limited resources
8.L3U1.9	Construct an explanation of how genetic variations occur in offspring through the inheritance of traits or through mutations.	E/S	C/E; E/M; S/C	identify traits that can vary from parent to offspring	distinguish genetic variations that occur through inheritance versus from mutation	demonstrate how genetic variations occur in offspring through inheritance or through mutation	predict genetic variations that may result from inheritance or mutation

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8.L4U1.11	Develop and use a model to explain how natural selection may lead to increases and decreases of specific traits in populations over time.	MOD	C/E; E/M; S/C	identify the frequency of traits that exist in a population	distinguish traits that increase or decrease in a population over time due to natural selection	demonstrate how natural selection can alter the frequency of traits in a population over time	evaluate explanations of how natural selection affects trait frequency over time
8.L4U1.12	Gather and communicate evidence on how the process of natural selection provides an explanation of how new species can evolve.	INFO; ARG	C/E; E/M; S/C	identify external pressures that can affect the process of natural selection	describe how external pressures affect the process of natural selection	show how natural selection provides an explanation of how new species can evolve	evaluate explanations of how natural selection promotes the emergence of new species