

Connecticut Alternate Science Field Test

NGSS Standard Performance Expectations and Essence Statements

Earth Science Storyline 1: Earth Systems		
Grade	NGSS Standard Performance Expectations	Essence Statements
Grade 5	3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	CTAS-3-ESS2-1 Use and interpret data in tables and graphs to describe typical weather conditions expected during a particular season.
	3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.	CTAS-3-ESS2-2 Use information to describe climates in different regions of the United States.
	5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	CTAS-5-ESS2-1 Use a model to show how wind and water interact with land and living organisms.
Grade 8	MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	CTAS-MS-ESS2-2 Construct an explanation based on evidence for how the movements of water, ice, and wind can change the Earth's surface.
	MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	CTAS-MS-ESS2-4 Use a model to explain how the sun's energy and gravity cause water to cycle between the land and the atmosphere.
	MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.	CTAS-MS-ESS2-5 Use data to provide evidence of atmospheric conditions that result in precipitation.
Grade 11	HS-ESS2-4 Use a model to describe how variations in the flow of energy into and out of Earth's systems results in change in climate.	CTAS-HS-ESS2-4 Use a model to describe how the sun's energy and its distribution on Earth influence climate.
	HS-ESS2-5 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.	CTAS-HS-ESS2-5 Use the results of an investigation to show the effects of flowing water (erosion) and freezing water (mechanical weathering) on the Earth's surface.

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Earth Science Storyline 2: Natural Resources		
Grade	NGSS Standard Performance Expectations	Essence Statements
Grade 5	4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	CTAS-4-ESS3-1 Use information to describe renewable (wind, water, and solar) and non-renewable (coal, oil, and natural gas) sources of energy and how their uses affect the environment.
	5-ESS2-2 Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	CTAS-5-ESS2-2 Interpret data to compare the relative amounts of fresh and salt water on Earth, and use maps to show their locations in various reservoirs (lakes, rivers, and oceans).
	5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	CTAS-5-ESS3-1 Use information from multiple sources to describe ways people can protect our natural resources (water, air, land).
Grade 8	MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	CTAS-MS-ESS3-1 Use evidence to explain that natural resources (fresh water, soil, fossil fuels) used by humans are often limited and not easily replaced by natural processes.
	MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.*	CTAS-MS-ESS3-3 Evaluate a method for minimizing human impact (waste production) on the environment.*
	MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	CTAS-MS-ESS3-4 Analyze data to provide evidence of the amount of water used by humans for everyday purposes.
Grade 11	HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.	CTAS-HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources influences human activity.
	HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*	CTAS-HS-ESS3-4 Evaluate a technological solution (e.g., energy generated from water, wind, or the sun) that reduces impacts of human activities on the environment.*
	HS-ESS3-3 Create a computer simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.	CTAS-HS-ESS3-3 Analyze data to show the relationship between the management of a natural resource and the population of organisms living in an environment.

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Life Science		
Storyline 3: Living Organisms		
Grade	NGSS Standard Performance Expectations	Essence Statements
Grade 5	4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	CTAS-4-LS1-1 Make and support a claim that plants and animals have structures that function to support survival, growth, and behavior.
	3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	CTAS-3-LS1-1 Compare simple models to describe the similarities and differences in the life cycle stages (birth, growth, reproduction, and death) of common organisms.
Grade 8	MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	CTAS-MS-LS1-1 Use the results of an investigation as evidence that living things are made of different types of cells.
	MS-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	CTAS-MS-LS1-3 Make and support a claim based on evidence that the human body is made up of cells and tissues that form body systems.
	MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	CTAS-MS-LS1-4 Make and support a claim based on evidence for how animal behaviors and plant structures affect their ability to survive and reproduce.
Grade 11	HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	CTAS-HS-LS1-2 Use a model to show how the parts of a human organ system (e.g., nervous, muscular, circulatory, digestive, reproductive) and the organ system itself work together to perform functions.
	HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	CTAS-HS-LS1-3 Use the results of an investigation as evidence that living systems respond to external change in order to maintain balance and survive.
	HS-LS1-4 Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.	CTAS-HS-LS1-4 Use a model to show how cell changes (e.g., maintenance through division, differentiation, or multiplication) results in changes to the organism (e.g., growth, complexity).

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Life Science		
Storyline 4: Healthy Ecosystems		
Grade	NGSS Standard Performance Expectations	Essence Statements
Grade 5	5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	CTAS-5-LS2-1 Use a simple model to describe the movement of matter among plants and animals in the environment.
	3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*	CTAS-3-LS4-4 Given evidence, compare possible solutions to a problem that causes changes in an environment affecting the plants and animals that live there.*
	3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	CTAS-3-LS4-3 Make and support a claim that in a given habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
Grade 8	MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	CTAS-MS-LS2-1 Interpret data to provide evidence for the effects of resource availability on populations of organisms in an ecosystem.
	MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*	CTAS-MS-LS2-5 Evaluate a solution to maintaining a healthy ecosystem, including the physical environment and the plants and animals that live there.
	MS-LS4-6 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	CTAS-MS-LS4-6 Use data to support an explanation for a change in the traits of animals and plants in a population over time.

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Life Science		
Storyline 4: Healthy Ecosystems		
Grade	NGSS Standard Performance Expectations	Essence Statements
Grade 11	HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.	CTAS-HS-LS2-1 Use data to explain the factors that affect the limits on plant and animal populations in an ecosystem.
	HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*	CTAS-HS-LS2-7 Evaluate a possible solution for reducing the impact of human activities on the environment, including plants and animals.*
	HS-LS2-8 Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.	CTAS-HS-LS2-8 Use evidence to show how group behaviors help animals survive and reproduce.
	HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.	CTAS-HS-LS4-4/5 Use evidence to explain how natural selection leads to adaptation, growth, and/or possible extinction of populations of organisms and/or species.
	HS-LS4-5 Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.	

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Physical Science Storyline 5: Forces and Motion		
Grade	NGSS Standard Performance Expectations	Essence Statements
Grade 5	3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	CTAS-3-PS2-1 Use the results of an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
	3-PS2-2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	CTAS-3-PS2-2 Make observations and/or measurements to show the pattern of an object's motion and to make predictions.
Grade 8	MS-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	CTAS-MS-PS2-2 Use and evaluate the results of an investigation to provide evidence that the change in an object's motion depends on the forces acting on the object and the mass of the object. <i>Note: Students are not expected to understand the difference between mass and weight.</i>
Grade 11	HS-PS2-1 Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	CTAS-HS-PS2-1 Use observations and/or data to support a claim that the net force on an object is equal to its mass multiplied by its acceleration. <i>Note: Students are not expected to understand the difference between mass and weight.</i>
	HS-PS2-3 Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.*	CTAS-HS-PS2-3 Test a device that minimizes the force on a common object during a collision.*

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Physical Science		
Storyline 6: Using Energy Every Day		
Grade	NGSS Standard Performance Expectations	Essence Statements
Grade 5	4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	CTAS-4-PS3-2 Make observations that light and heat are forms of energy that can be transferred from place to place.
	5-PS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	CTAS-5-PS3-1 Use a simple model to describe that light energy comes from the sun, and is used by plants to grow and produce food that is eaten by animals and/or humans that they use for various purposes.
Grade 8	MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*	CTAS-MS-PS3-3 Test a device that either minimizes or maximizes heat energy transfer.*
	MS-PS3-5: Construct, use and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from an object.	CTAS-MS-PS3-5 Make and support a claim about the transfer of energy (kinetic energy) between two objects.
Grade 11	HS-PS3-3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.*	CTAS-HS-PS3-3 Test a device that converts one form of energy into another form of energy.*
	HS-PS3-4 Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	CTAS-HS-PS3-4 Use the results of an investigation as evidence that when objects at different temperatures are brought together in a system, they will eventually reach equilibrium (the same temperature).

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