New York State Testing Program

P-12 Science Learning Standards

Performance Level Descriptions

Life Science: Biology

Fall 2023

THE STATE EDUCATION DEPARTMENT / THE UNIVERSITY OF THE STATE OF NEW YORK /
ALBANY, NY 12234

Life Science: Biology Performance Level Descriptions

Performance level descriptions (PLDs) help communicate to students, families, educators, and the public the specific knowledge and skills expected of students in order for them to demonstrate proficiency in each Learning Standard for Science. The PLDs serve several purposes in classroom instruction and assessment. They are the foundation of rich discussion around what students need to do to perform at higher levels, and they explain the progression of learning within a subject area. PLDs are also crucial in explaining student performance on the New York State (NYS) assessments since they make a connection between the scale score, the performance level (e.g., meets the expectation of the learning standards) and specific knowledge and skills typically demonstrated by students achieving at that level.

Policy Definitions of Performance Levels

For each subject area, students perform along a continuum of the knowledge and skills necessary to meet the demands of the Learning Standards for Science. There are students who meet the expectations of the standards with distinction, students who fully meet the expectations, students who minimally meet the expectations, students who partially meet the expectations, and students who do not demonstrate sufficient knowledge or skills required for any performance level. New York State assessments are designed to classify student performance into one of five levels based on the knowledge and skills the student has demonstrated. These performance levels for the Regents level science test are defined as:

NYS Level 5

Students performing at this level meet the expectations of the Science Learning Standards with distinction for Life Science: Biology.

NYS Level 4

Students performing at this level fully meet the expectations of the Science Learning Standards for Life Science: Biology. They are likely prepared to succeed in the next level of coursework.

NYS Level 3

Students performing at this level minimally meet the expectations of the Science Learning Standards for Life Science: Biology. They meet the content area requirements for a Regents diploma but may need additional support to succeed in the next level of coursework.

NYS Level 2

Students performing at this level partially meet the expectations of the Science Learning Standards for Life Science: Biology. Students with disabilities performing at this level meet the content area requirements for a local diploma but may need additional support to succeed in the next level of coursework.

NYS Level 1

Students performing at this level demonstrate knowledge, skills and practices embodied by the Science Learning Standards for Life Science: Biology below that of a Level 2.

How were the PLDs developed?

Following research-based best practice for the development of PLDs, the number of performance levels and their definitions were specified prior to the articulation of the full descriptions. The New York State Education Department (NYSED) convened a group of NYS science educators to develop the initial draft PLDs for Life Science: Biology. In developing PLDs, participants considered policy definitions of the performance levels and the knowledge and skill expectations for each grade level in the Science Learning Standards. Once they established the appropriate knowledge and skills from a particular standard for NYS Level 4 (fully meet), panelists worked together to parse the knowledge and skills across the other performance levels in such a way that the progression of the knowledge and skills was clearly seen moving from Level 1 to Level 5. This process was repeated for all of the standards within the course. The draft PLDs then went through additional rounds of review and edits from a number of NYS-certified educators, content specialists, and assessment experts under NYSED supervision.

How can the PLDs be used in Instruction?

The PLDS, which differentiate and stratify the overall continuum of knowledge and skills defined by the Learning Standards into five distinct levels of learning should be used as guidance by educators. NYSED encourages the use of the PLDs for a variety of purposes, including differentiating instruction to maximize individual student outcomes, creating formative classroom assessments and rubrics to help identify target performance levels for individuals or groups of students, and tracking student growth along the proficiency continuum as described by the PLDs. The knowledge and skills shown in the PLDs describe *typical* performance and progression. However, the order in which students will demonstrate the knowledge and skills within and between performance levels may be staggered (i.e., a student who predominantly demonstrates Level 3 knowledge and skills may simultaneously demonstrate certain knowledge and skills indicative of Level 4). Although the ranges of skills expected of students at each performance level are detailed in the PLDs, specific science concepts will be elaborated and expanded as those skills are applied in the science classroom. Because the Learning Standards for science encompass the Science and Engineering Practices (SEP), Disciplinary Core Ideas (DCI), and Crosscutting Concepts (CCC), each of them must be examined in depth. The integration of these three dimensions provides students with a context for the content of science, a sense of how science knowledge is acquired and understood, and a sense of how the sciences are connected through concepts that have universal meaning across the disciplines.

How are the PLDs used in Assessment?

PLDs are essential in setting performance standards (i.e., “cut scores”) for New York State assessments. Standard setting panelists use PLDs to determine the expectations for students to demonstrate the knowledge and skills necessary to *just barely* attain a Level 2, Level 3, Level 4 or Level 5 on the assessment. This knowledge and these skills drive discussions that influence the panelists as they recommend the cut scores on the assessment. PLDs are also used in question development. Question writers are assigned to write questions that draw on the specific knowledge and skills from a PLD. This ensures that each test has questions that measure student performance all along the continuum. Questions on the Science Regents Examinations will emphasize skills from the PLDs that can be measured via written assessment. Teachers can use the PLDs in the same manner when developing both formative and summative classroom assessments. Tasks that require students to demonstrate knowledge and skills from the PLDs can be tied back to the performance level with which the PLD

is associated, providing the teacher with feedback about the students' progress as well as a wealth of other skills that the students are likely able to demonstrate (or can aspire to in the case of the next-highest PLD).

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Structure and Function **HS-LS1-1**	Construct and revise an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out essential functions.	Describe the evidence that supports an explanation that the structure of DNA determines the structure of proteins.	Identify the evidence that supports the claim/explanation that the structure of DNA determines the structure of proteins **or** identify the explanation/claim using given evidence that the structure of DNA determines the structure of proteins.
Structure and Function **HS-LS1-2**	Develop and revise a model based on evidence to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Complete a model to illustrate that the hierarchical organization of interacting systems provides specific functions within multicellular organisms.	Given a model, describe the organization of at least two systems and the interactions of those systems within an organism.	Given a model, identify components that show interactions of two systems within an organism.
Structure and Function **HS-LS1-3**	Plan, conduct, and evaluate an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Plan an investigation that could provide evidence that feedback mechanisms maintain homeostasis **or** given a plan and the results of an investigation, describe the evidence that feedback mechanisms maintain homeostasis.	Given an investigation with data, provide/identify the evidence that supports a claim that feedback mechanisms maintain homeostasis.	Given an investigation with data, identify an explanation for how a feedback mechanism maintains homeostasis.

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Matter and Energy in Organisms and Ecosystems **HS-LS1-5**	Develop a model to illustrate how photosynthesis transforms light energy into stored chemical energy.	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.	Use a model to identify the inputs and outputs of matter and energy in photosynthesis.	Use a model to identify the correct explanation that photosynthesis converts light energy into chemical energy.	Identify the correct model that shows how photosynthesis converts light energy into chemical energy.
Matter and Energy in Organisms and Ecosystems **HS-LS1-6**	Construct and revise an explanation based on evidence from a variety of sources for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements such as nitrogen, sulfur, and phosphorus to form amino acids and other carbon-based molecules.	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements such as nitrogen, sulfur, and phosphorus to form amino acids and other carbon-based molecules.	Construct or revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements such as nitrogen, sulfur, and phosphorus to form amino acids and/or other carbon-based molecule(s).	Support a given explanation, by providing/identify evidence, for how the elements from sugar molecules may combine with other elements to form amino acids and/or other carbon-based molecule(s).	Identify the explanation, from those provided, using given evidence, that supports the claim that the elements from sugar molecules may combine with other elements to form amino acids and/or other carbon-based molecule(s).
Matter and Energy in Organisms and Ecosystems **HS-LS1-7**	Develop a model to illustrate that aerobic cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.	Use a model to illustrate that aerobic cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.	Use a model to illustrate the inputs and outputs of cellular respiration by which the energy in the bonds of food molecules is converted and made available to the organism in a usable form.	Use a model to identify that cellular respiration is a chemical process by which the energy in food molecules is converted and is made available to the organism in a useable form **or** identify the inputs and outputs of cellular respiration.	Use a model to identify that cellular respiration is a chemical process by which the energy in food molecules is made available to the organism in a usable form **or** identify the correct model that represents cellular respiration.

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Topic and PE	NYS Level 5	NYS Level 4	NYS Level 3	NYS Level 2	NYS Level 1
Matter and Energy in Organisms and Ecosystems **HS-LS2-3**	Construct and revise an explanation, based on evidence obtained from a variety of reliable sources, for the cycling of matter and flow of energy in ecosystems.	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in ecosystems.	Construct or revise an explanation based on evidence for the cycling of matter and/or flow of energy in ecosystems related to photosynthesis and/or cellular respiration.	Support a given explanation by providing/identifying evidence for the cycling of matter and/or flow of energy in ecosystems related to photosynthesis and/or cellular respiration.	Identify the explanation or evidence, from those provided, for the cycling of matter and/or flow of energy in ecosystems related to photosynthesis and/or cellular respiration.
Matter and Energy in Organisms and Ecosystems **HS-LS2-4**	Revise a mathematical representation to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.	Use a mathematical representation to make a qualitative or quantitative claim that matter cycles and/or energy flows among organisms in an ecosystem.	Use a mathematical representation to identify a qualitative or quantitative claim that matter cycles or energy flows among organisms in an ecosystem.	Use a mathematical representation to identify a qualitative or quantitative evidence, from those provided, that matter cycles or energy flows among organisms in an ecosystem.
Matter and Energy in Organisms and Ecosystems **HS-LS2-5**	Develop and revise a model to predict the impact of changing a particular characteristic of a system on the various processes in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.	Develop a model to illustrate the role of various processes in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.	Complete or use a model to provide evidence that supports the cycling of carbon between at least two spheres (biosphere, atmosphere, hydrosphere, and/or geosphere.)	Use a model to describe the role of one process involved in the cycling of carbon between two of Earths spheres.	Use a model to identify one process involved in the cycling of carbon between two of Earths spheres.

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Interdependent Relationships in Ecosystems **HS-LS2-1**	Develop, analyze, and/or apply mathematical and/or computational representations to support explanations of biotic and abiotic factors at different scales, proportions, and quantities affecting the carrying capacity of ecosystems.	Use mathematical and/or computational representations to support explanations of biotic and abiotic factors that affect carrying capacity of ecosystems at different scales.	Use a mathematical and/or computational representation to support an explanation of a biotic or an abiotic factor that affects the carrying capacity of an ecosystem at different spatial or temporal scales.	Use a mathematical and/or computational representation to describe how a biotic and/or abiotic factor affects the carrying capacity of a population.	Use a mathematical and/or computational representation to identify, from those provided, a factor that affects the carrying capacity of a population.
Interdependent Relationships in Ecosystems **HS-LS2-2**	Develop, analyze, and/or apply mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.	Use a mathematical representation to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.	Use a mathematical representation to revise an explanation based on evidence about factor(s) affecting biodiversity and/or population(s) in ecosystem(s) of different scales.	Use a mathematical representation to support a given explanation by identifying evidence about factor(s) affecting biodiversity and/or population(s) in ecosystem(s).	Use a mathematical representation to identify a factor, from those provided, that affects biodiversity or populations in an ecosystem.

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Interdependent Relationships in Ecosystems **HS-LS2-6**	Use claims, evidence, and reasoning, to argue the merits of explanations regarding complex interactions in ecosystems and their ability to maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new ecosystem.	Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new ecosystem.	Evaluate a claim using evidence that the complex interactions in an ecosystem maintain relatively consistent numbers and types of organisms in stable conditions or that changing conditions may result in a new ecosystem.	Identify an evidence-based claim that the complex interactions in an ecosystem maintain relatively consistent numbers and types of organisms in stable conditions or that changing conditions may result in a new ecosystem **or** given evidence, from those provided, identify the claim that describes the complex interactions.	Identify the evidence, from those provided, that supports the claim that complex interactions in an ecosystem maintain relatively consistent numbers and/or types of organisms in stable conditions.
Interdependent Relationships in Ecosystems **HS-LS2-7**	Design, evaluate, and refine solutions, including tradeoffs, for reducing the impacts of human activities on the environment and biodiversity.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	Refine a design solution for reducing the impact(s) of a human activity on the environment and/or biodiversity.	Evaluate a given design solution for how well it reduces the impact(s) of a human activity on the environment and/or biodiversity.	Identify, from those provided, the best design solution for reducing the impact(s) of human activity on the environment and biodiversity.
Interdependent Relationships in Ecosystems **HS-LS2-8**	Evaluate the evidence and develop an argument based on the cause-and-effect relationship of group behavior on individuals and species' chances to survive and reproduce.	Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.	Evaluate the evidence to make/support a claim regarding the role of group behavior on an individual's or species' chance to survive and/or reproduce.	Describe the evidence that supports the role of group behavior on an individual's and/or species chance to survive and/or reproduce.	Identify the evidence that supports the role of group behavior on an individual's and/or the species' chance to survive and/or reproduce.

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Inheritance and Variation of Traits HS-LS1-4	Revise a model based on evidence to illustrate cellular division (mitosis) and differentiation.	Use a model to illustrate cellular division (mitosis) and differentiation.	Use a model to describe the process of cellular division (mitosis) or differentiation.	Use a model to identify one result of cellular division (mitosis) and differentiation.	Use a model to identify one result of cellular division (mitosis) or differentiation.
Inheritance and Variation of Traits HS-LS3-1	Ask questions to clarify relationships about the role of non-coding and coding regions of DNA, and chromosomes that pass the instructions for characteristic traits from parents to offspring.	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.	Ask a question to clarify the role of DNA and/or chromosomes in coding the instructions for characteristic traits passed from parents to offspring.	Identify a question, from those provided, about the role of DNA and/or chromosomes in coding the instructions for characteristic traits passed from parents to offspring.	Identify a question, from those provided, about the role of DNA and/or chromosomes in the passing of traits from parents to offspring.
Inheritance and Variation of Traits HS-LS3-2	Make and defend a claim based on evidence regarding the causes of inheritable genetic variations, which may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, (3) mutations caused by environmental factors and/or (4) genetic engineering, and the variation's effect.	Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, (3) mutations caused by environmental factors and/or (4) genetic engineering.	Make or defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis and/or (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors and/or (4) genetic engineering.	Identify a claim based on evidence for a cause of inheritable genetic variation.	Identify a claim, from those provided, based on evidence that inheritable genetic variation occurs.

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Topic and PE	NYS Level 5	NYS Level 4	NYS Level 3	NYS Level 2	NYS Level 1
Inheritance and Variation of Traits **HS-LS3-3**	Apply concepts of statistics and probability to explain that changing a variable can affect the variation and distribution of expressed traits in a population.	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.	Apply concepts of statistics and probability to explain the variation or distribution of expressed trait(s) in a population.	Analyze and interpret data to describe the variability or distribution of an expressed trait in a population.	Use data to identify the distribution or variability of an expressed trait in a population.
Inheritance and Variation of Traits **HS-LS1-8 NYSED**	Revise a model to illustrate a disruption/change and its impact on human reproduction and development.	Use models to illustrate how human reproduction and development maintains the continuity of life.	Use model(s) to describe or explain how human reproduction and/or development maintains the continuity of life.	Use a model to describe a structure and/or a function involved in human reproduction and development.	Use a model to identify a structure and/or a function involved in human reproduction or development.

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Natural Selection and Evolution **HS-LS4-1**	Compare and evaluate sources of information illustrating patterns showing that common ancestry and biological evolution are supported by multiple lines of empirical evidence and communicate findings.	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.	Describe the scientific information that is supported by empirical evidence for common ancestry and/or evolution.	Identify scientific information that is supported by empirical evidence for common ancestry and/or evolution.	Use information to identify the empirical evidence, from those provided, for common ancestry.
Natural Selection and Evolution **HS-LS4-2**	Construct an explanation based on evidence obtained from a variety of reliable sources that natural selection is a process leading to biological evolution of a species, primarily caused by four factors: (1) the potential of species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.	Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential of species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.	Construct an explanation based on evidence that the process of evolution can involve: (1) the potential of species to increase in number, and/or (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, and/or (3) competition for limited resources, and/or (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.	Identify the explanation based on evidence that evolution is the result of genetic and/or environmental factor(s) **or** justify why the given explanation is correct or incorrect.	Identify the evidence, from those provided, that supports the explanation that evolution is the result of a genetic and/or an environmental factor.

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Topic and PE	NYS Level 5	NYS Level 4	NYS Level 3	NYS Level 2	NYS Level 1
Natural Selection and Evolution **HS-LS4-3**	Apply concepts of statistics and probability to support explanations and predict patterns that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.	Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.	Apply mathematical concepts to support an explanation and/or identify a pattern to describe a trend in a trait in a population over time (based on environmental factors).	Use a given mathematical representation to describe a pattern and/or describe a trend in a trait in a population over time.	Use a given mathematical representation, from those provided, to identify a pattern in a trait in a population over time.
Natural Selection and Evolution **HS-LS4-4**	Construct an explanation based on evidence obtained from a variety of reliable sources that identifies cause and effect relationships for how natural selection leads to adaptation of populations and predicts changes relating to gene or trait frequencies.	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.	Construct and/or identify an explanation based on evidence that natural selection leads to adaptation of populations.	Identify an evidence-based explanation that an environmental factor could affect a population (due to a change in gene frequency).	Identify the evidence that an environmental factor can cause a change in a population (gene frequency).
Natural Selection and Evolution **HS-LS4-5**	Evaluate the evidence and generate an argument defending/refuting a claim that changes in environmental conditions may cause situations which 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.	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.	Explain how the provided evidence supports a claim that environmental conditions may cause a change in species such as (1) increases in the number of individuals, and/or (2) the emergence of new species over time, and/or (3) the extinction of species.	Identify a claim supported by evidence that a change in an environmental condition may cause changes in a species or justify if the provided evidence supports or does not support a claim that conditions may cause changes in species.	Identify the evidence that supports that a change in an environmental condition may cause changes in species.

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Earth's Systems **HS-ESS2-6**	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere and predict the effects of a change in carbon dioxide concentrations due to human activity affecting climate.	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.	Use/complete a quantitative model to describe the cycling of carbon between two Earth spheres (hydrosphere, atmosphere, geosphere, and biosphere).	Use a qualitative or quantitative model to identify the cycling of carbon between two Earth spheres (hydrosphere, atmosphere, geosphere, and biosphere).	Given a qualitative or quantitative model, identify a process that returns carbon to the hydrosphere, or atmosphere, or geosphere, or biosphere.
Earth's Systems **HS-ESS2-7**	Construct, compare, and critique arguments supported by evidence about the coevolution of Earth's systems and life on Earth.	Construct an argument based on evidence about the coevolution of Earth's systems and life on Earth.	Describe the evidence that supports a given argument about the coevolution of feedbacks between Earth's systems and life on Earth.	Identify the evidence that supports an argument about the coevolution of feedbacks between Earth's systems and life on Earth.	Identify an argument, from those provided, that supports the coevolution of Earth's systems and life on Earth.

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Topic and PE	NYS Level 5	NYS Level 4	NYS Level 3	NYS Level 2	NYS Level 1
Engineering Design HS-ETS1-1	Evaluate two or more major global challenges to specify qualitative and quantitative criteria and constraints for solutions, which could include new technologies, that account for societal needs and wants.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	Analyze a major global challenge to specify qualitative or quantitative criteria and constraints for solutions that account for societal needs and wants.	Given a major global challenge, describe the qualitative or quantitative criteria or constraint for the given solution that best accounts for societal needs or wants.	Given a major global challenge, identify the criteria or constraint for the given solution that best accounts for societal needs or wants.
Engineering Design HS-ETS1-2	For a complex real-world problem, design multiple solutions to sub-problems based on student generated data and/or scientific information from other sources. Describe the rationale, criteria, and constraints of each sub-problem.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	Given a complex real-world problem, identify one smaller more manageable problem and describe a solution to that problem that can be solved through engineering.	Given a complex real-world problem that has been broken down into smaller, more manageable problems, identify a solution to one smaller problem that can be solved through engineering.	Identify the solution, from those provided, that addresses a smaller, more manageable real-world problem.

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Engineering Design **HS-ETS1-3**	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts. Explain how these solutions affect society and the environment.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.	Identify a solution to a complex real-world problem based on prioritized criteria and/or trade-offs (positives and negatives) for a range of constraints, such as cost, safety, reliability, and aesthetics, as well as possible social, cultural or environmental impacts.	Describe a solution to a complex real-world problem based on given criteria and constraints.	Identify a solution, from those provided, to a complex real-world problem based on given criteria and/or constraints.
Engineering Design **HS-ETS1-4**	Use a computer simulation to model the impact of proposed solutions to related complex real-world problems with numerous criteria and constraints on interactions within and between systems relevant to the problem.	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.	Given data (from a computer simulation) describe the impact of proposed solutions to a complex real-world problem with limited criteria and constraints on interactions within and/or between systems relevant to the problem.	Given data (from a computer simulation) identify the impact of a proposed solution to a complex real-world problem, or the impact on an interaction within or between two systems relevant to the problem.	Identify the impact of a given solution to a complex real-world problem.