New York Science

NY Grade 3 Science Learning Standards

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I **3-5. Engineering Design** 3-5.ETS1

A Performance Expectations 3-5.ETS1.ED

1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. 3-5.ETS1.1

2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. 3-5.ETS1.2

3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. 3-5.ETS1.3

B Science and Engineering Practices 3-5.ED.SEP

1 Asking Questions and Defining Problems 3-5.ED.SEP.1

a Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5- ETS1-1) 3-5.ED.SEP.1A

2 Planning and Carrying Out Investigations 3-5.ED.SEP.2

a Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-5-ETS1-3) 3-5.ED.SEP.2A

3 Constructing Explanations and Designing Solutions 3-5.ED.SEP.3

a Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1- 2) 3-5.ED.SEP.3A

Skip to main content

C Disciplinary Core Ideas 3-5.ED.DCI

1 ETS1.A: Defining and Delimiting Engineering Problems 3-5.ED.DCI.ETS1.A

a Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1) 3-5.ED.DCI.ETS1.A.1

2 ETS1.B: Developing Possible Solutions 3-5.ED.DCI.ETS1.B

a Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2) 3-5.ED.DCI.ETS1.B.1

b At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2) 3-5.ED.DCI.ETS1.B.2

c Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3) 3-5.ED.DCI.ETS1.B.3

3 ETS1.C: Optimizing the Design Solution 3-5.ED.DCI.ETS1.C

a Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3) 3-5.ED.DCI.ETS1.C.1

D Crosscutting Concepts 3-5.ED.CC

1 Influence of Science, Engineering, and Technology on Society and the Natural World 3-5.ED.CC.1

a People's needs and wants change over time, as do their demands for new and improved technologies. (3-5-ETS1-1) 3-5.ED.CC.1A

b Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS1-2) 3-5.ED.CC.1B

I **3. Forces and Interactions** 3.PS2

A Performance Expectations 3.PS2.1.FI

1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. 3.PS2.1

2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. 3.PS2.2

3 Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other 3.PS2.3

4 Define a simple design problem that can be solved by applying scientific ideas about magnets. 3.PS2.4

Skip to main content

B Science and Engineering Practices 3.FI.SEP

1 Asking Questions and Defining Problems 3.FI.SEP.1

a Ask questions that can be investigated based on patterns such as cause and effect relationships. (3- PS2-3) 3.FI.SEP.1A

b Define a simple problem that can be solved through the development of a new or improved object or tool. (3- PS2-4) 3.FI.SEP.1B

2 Planning and Carrying Out Investigations 3.FI.SEP.2

a Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-PS2-1) 3.FI.SEP.2A

b Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2) 3.FI.SEP.2B

3 Science Knowledge is Based on Empirical Evidence 3.FI.SEP.3

a Science findings are based on recognizing patterns. (3- PS2-2) 3.FI.SEP.3A

4 Scientific Investigations Use a Variety of Methods 3.FI.SEP.4

a Science investigations use a variety of methods, tools, and techniques. (3-PS2-1) 3.FI.SEP.4A

C Disciplinary Core Ideas 3.FI.DCI

1 PS2.A: Forces and Motion 3.FI.DCI.PS2.A

a Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3- PS2-1) 3.FI.DCI.PS2.A.1

b The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2) 3.FI.DCI.PS2.A.2

2 PS2.B: Types of Interactions 3.FI.DCI.PS2.B

a Objects in contact exert forces on each other. (3-PS2-1) 3.FI.DCI.PS2.B.1

b Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3),(3-PS2-4) 3.FI.DCI.PS2.B.2

Skip to main content

D Crosscutting Concepts 3.FI.CC

1 Patterns 3.FI.CC.1

a Patterns of change can be used to make predictions. (3-PS2-2) 3.FI.CC.1A

2 Cause and Effect 3.FI.CC.2

a Cause and effect relationships are routinely identified. (3- PS2-1) 3.FI.CC.2A

b Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3) 3.FI.CC.2B

3 Interdependence of Science, Engineering, and Technology 3.FI.CC.3

a Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3- PS2-4) 3.FI.CC.3A

I **3. Interdependent Relationships in Ecosystems** 3.LS2

A Performance Expectations 3.LS2.IRE

1 Construct an argument that some animals form groups that help members survive. 3.LS2.1

2 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. 3.LS4.1

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. 3.LS4.3

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. 3.LS4.4

B Science and Engineering Practices 3.IRE.SEP

1 Analyzing and Interpreting Data 3.IRE.SEP.1

a Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1) 3.IRE.SEP.1A

2 Engaging in Argument from Evidence 3.IRE.SEP.2

a Construct an argument with evidence, data, and/or a model. (3-LS2-1) 3.IRE.SEP.2A

b Construct an argument with evidence. (3-LS4-3) 3.IRE.SEP.2B

c Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4) 3.IRE.SEP.2C

Skip to main content

C Disciplinary Core Ideas 3.IRE.DCI

1 LS2.C: Ecosystem Dynamics, Functioning, and Resilience 3.IRE.DCI.LS2.C

a When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4) 3.IRE.DCI.LS2.C.1

2 LS2.D: Social Interactions and Group Behavior 3.IRE.DCI.LS2.D

a (NYSED) Being part of a group helps some animals obtain food, defend themselves, and survive. Groups may serve different functions and vary dramatically in size. (Note: Moved from K–2) (3-LS2-1) 3.IRE.DCI.LS2.D.1

3 LS4.A: Evidence of Common Ancestry and Diversity 3.IRE.DCI.LS4.A

a Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note: Moved from K–2) (3-LS4-1) 3.IRE.DCI.LS4.A.1

b Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3- LS4-1) 3.IRE.DCI.LS4.A.2

4 LS4.C: Adaptation 3.IRE.DCI.LS4.C

a For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3 3.IRE.DCI.LS4.C.1

5 LS4.D: Biodiversity and Humans 3.IRE.DCI.LS4.D

a Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4) 3.IRE.DCI.LS4.D.1

D Crosscutting Concepts 3.IRE.CC

1 Cause and Effect 3.IRE.CC.1

a Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1),(3-LS4-3) 3.IRE.CC.1A

2 Scale, Proportion, and Quantity 3.IRE.CC.2

a Observable phenomena exist from very short to very long time periods. (3-LS4-1) 3.IRE.CC.2A

3 Systems and System Models 3.IRE.CC.3

a A system can be described in terms of its components and their interactions. (3-LS4-4) 3.IRE.CC.3A

4 Interdependence of Science, Engineering, and Technology 3.IRE.CC.4

a Knowledge of relevant scientific concepts and research findings is important in engineering. (3-LS4-4) 3.IRE.CC.4A

5 Scientific Knowledge Assumes an Order and Consistency in Natural Systems 3.IRE.CC.5

a Science assumes consistent patterns in natural systems. (3- LS4-1) 3.IRE.CC.5A

Skip to main content

I **3. Inheritance and Variation of Traits: Life Cycles and Traits** 3.LS1

A Performance Expectations 3.LS1.IVT

1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. 3.LS1.1

2 Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. 3.LS3.1

3 Use evidence to support the explanation that traits can be influenced by the environment. 3.LS3.2

4 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. 3.LS4.2

B Science and Engineering Practices 3.IVT.SEP

1 Developing and Using Models 3.IVT.SEP.1

a Develop models to describe phenomena. (3-LS1-1) 3.IVT.SEP.1A

2 Analyzing and Interpreting Data 3.IVT.SEP.2

a Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1) 3.IVT.SEP.2A

3 Constructing Explanations and Designing Solutions 3.IVT.SEP.3

a Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2) 3.IVT.SEP.3A

b Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2) 3.IVT.SEP.3B

4 Scientific Knowledge is Based on Empirical Evidence 3.IVT.SEP.4

a Science findings are based on recognizing patterns. (3-LS1-1) 3.IVT.SEP.4A

Skip to main content

C Disciplinary Core Ideas 3.IVT.DCI

1 LS1.B: Growth and Development of Organisms 3.IVT.DCI.LS1.B

a Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1) 3.IVT.DCI.LS1.B.1

2 LS3.A: Inheritance of Traits 3.IVT.DCI.LS3.A

a Many characteristics of organisms are inherited from their parents. (3-LS3-1) 3.IVT.DCI.LS3.A.1

b Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. (3-LS3-2) 3.IVT.DCI.LS3.A.2

c (NYSED) Some characteristics result from the interactions of both inheritance and the effect of the environment. (3-LS3-2)

3 LS3.B: Variation of Traits 3.IVT.DCI.LS3.B

a Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) 3.IVT.DCI.LS3.B.1

b The environment also affects the traits that an organism develops. (3-LS3-2) 3.IVT.DCI.LS3.B.2

4 LS4.B: Natural Selection 3.IVT.DCI.LS4.B

a Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2) 3.IVT.DCI.LS4.B.1

D Crosscutting Concepts 3.IVT.CC

1 Patterns 3.IVT.CC.1

a Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1) 3.IVT.CC.1A

b Patterns of change can be used to make predictions. (3- LS1-1) 3.IVT.CC.1B

2 Cause and Effect 3.IVT.CC.2

a Cause and effect relationships are routinely identified and used to explain change. (3-LS3- 2),(3-LS4-2) 3.IVT.CC.2A

I **3. Weather and Climate** 3.ESS2

Skip to main content

A Performance Expectations 3.ESS2.WC

1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. 3.ESS2.1

2 Obtain and combine information to describe climates in different regions of the world. 3.ESS2.2

3 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. 3.ESS3.1

4 Plan and conduct an investigation to determine the connections between weather and water processes in Earth systems. 3.ESS2.3

B Science and Engineering Practices 3.WC.SEP

1 Planning and Carrying Out Investigations 3.WC.SEP.1

a Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-ESS2-3) 3.WC.SEP.1A

b Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-ESS2-3) 3.WC.SEP.1B

2 Analyzing and Interpreting Data 3.WC.SEP.2

a Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) 3.WC.SEP.2A

3 Engaging in Argument from Evidence 3.WC.SEP.3

a Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1) 3.WC.SEP.3A

4 Obtaining, Evaluating, and Communicating Information 3.WC.SEP.4

a Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2) 3.WC.SEP.4A

Skip to main content

C Disciplinary Core Ideas 3.WC.DCI

1 ESS2.D: Weather and Climate 3.WC.DCI.ESS2.D

a Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) 3.WC.DCI.ESS2.D.1

b Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2) 3.WC.DCI.ESS2.D.2

c (NYSED) Earth's processes continuously cycle water, contributing to weather and climate. (3-ESS2-3) 3.WC.DCI.ESS2.D.3

2 ESS3.B: Natural Hazards 3.WC.DCI.ESS3.B

c A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2) 3.WC.DCI.ESS3.B.1

D Crosscutting Concepts 3.WC.CC

1 Patterns 3.WC.CC.1

a Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2) 3.WC.CC.1A

2 Cause and Effect 3.WC.CC.2

a Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS2-3),(3-ESS3-1) 3.WC.CC.2A

3 Influence of Engineering, Technology, and Science on Society and the Natural World 3.WC.CC.3

a (NYSED) Engineers improve existing technologies or develop new ones to increase their benefits (e.g., improved Doppler radar), decrease known risks (e.g., severe weather alerts), and meet societal demands (e.g., cell phone applications). (3-ESS3-1) 3.WC.CC.3A

4 Science is a Human Endeavor 3.WC.CC.4

a Science affects everyday life. (3-ESS3-1) 3.WC.CC.4A