Disciplinary Core Idea

K.ETS1.A: Defining and Delimiting Engineering Problems

A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (K-2-ETS1-1)

Disciplinary Core Idea

K.ETS1.A: Defining and Delimiting Engineering Problems

Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

Disciplinary Core Idea

K.ETS1.A: Defining and Delimiting Engineering Problems

Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)

Disciplinary Core Idea

K.ETS1.B: Developing Possible Solutions

Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2)

Disciplinary Core Idea

K.ETS1.C: Optimizing the Design Solution

Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

Disciplinary Core Idea

K.PS2.A: Forces and Motion

Pushes and pulls can have different strengths and directions. (K-PS2-2)

Disciplinary Core Idea

K.PS2.A: Forces and Motion

Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-2)

Disciplinary Core Idea

K.ETS1.A: Defining and Delimiting Engineering Problems

A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (K-PS2-2)

Disciplinary Core Idea

K.ESS3.B: Natural Hazards

Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2)

Disciplinary Core Idea

K.ETS1.A: Defining and Delimiting Engineering Problems

Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-ESS3-2)

Disciplinary Core Idea

K.ESS2.A: Earth Materials and Systems

Wind and water can change the shape of the land. (2-ESS2-1)

Disciplinary Core Idea

K.ETS1.C: Optimizing the Design Solution

Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (2-ESS2-1)

Disciplinary Core Idea

K.ESS3.C: Human Impacts on Earth Systems

Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)

Disciplinary Core Idea

K.ETS1.B: Developing Possible Solutions

Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-ESS3-3)

Disciplinary Core Idea

K.PS4.C: Information Technologies and Instrumentation

People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)

Disciplinary Core Idea

K.LS2.A: Interdependent Relationships in Ecosystems

Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

Disciplinary Core Idea

K.ETS1.B: Developing Possible Solutions

Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (2-LS2-2)

Performance Expectation

K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Clarification Statement: none
Assessment Boundary: none

Performance Expectation

K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Clarification Statement: none
Assessment Boundary: none

Performance Expectation

K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Clarification Statement: none
Assessment Boundary: none

Performance Expectation

K-PS2-2: Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.
Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.

Performance Expectation

K-ESS3-2: Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

Clarification Statement: Emphasis is on local forms of severe weather.
Assessment Boundary: none

Performance Expectation

2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.
Assessment Boundary: none

Performance Expectation

K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.
Assessment Boundary: none

Performance Expectation

1-PS4-4: Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string "telephones," and a pattern of drum beats.
Assessment Boundary: Assessment does not include technological details for how communication devices work.

Performance Expectation

2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Clarification Statement: none
Assessment Boundary: none

Science and Engineering Practice

Asking Questions and Defining Problems

Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.

Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)

Science and Engineering Practice

Asking Questions and Defining Problems

Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.

Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)

Science and Engineering Practice

Developing and Using Models

Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

Science and Engineering Practice

Analyzing and Interpreting Data

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

Science and Engineering Practice

Analyzing and Interpreting Data

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2)

Science and Engineering Practice

Asking Questions and Defining Problems

Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.

Ask questions based on observations to find more information about the designed world. (K-ESS3-2)

Science and Engineering Practice

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.

Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2)

Science and Engineering Practice

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions.

Compare multiple solutions to a problem. (2-ESS2-1)

Science and Engineering Practice

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.

Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3)

Science and Engineering Practice

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions.

Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4)

Science and Engineering Practice

Developing and Using Models

Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)

Crosscutting Concept

Structure and Function

The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

Crosscutting Concept

Cause and Effect

Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-2)

Crosscutting Concept

Cause and Effect

Events have causes that generate observable patterns. (K-ESS3-2)

Crosscutting Concept

Stability and Change

Things may change slowly or rapidly. (2-ESS2-1)

Crosscutting Concept

Cause and Effect

Events have causes that generate observable patterns. (K-ESS3-3)

Crosscutting Concept

Structure and Function

The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2)

Connection to Engineering, Technology, and Applications of Science

Science Addresses Questions About the Natural and Material World

Scientists study the natural and material world. (2-ESS2-1)

Connection to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology on Society and the Natural World

People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)

Connection to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

People encounter questions about the natural world every day. (K-ESS3-2)

Connection to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology on Society and the Natural World

Developing and using technology has impacts on the natural world. (2-ESS2-1)

Connection to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology on Society and the Natural World

People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.2.1 - Key Ideas and Details

Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1)

Common Core State Standards for ELA/Literacy

Speaking & Listening

SL.2.5 - Presentation of Knowledge and Ideas

Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)

Common Core State Standards for ELA/Literacy

Card Type name

W.2.6 - Production and Distribution of Writing

With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1), (K-2-ETS1-3)

Common Core State Standards for ELA/Literacy

Card Type name

W.2.8 - Research to Build and Present Knowledge

Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1), (K-2-ETS1-3)

Common Core State Standards for Mathematics

Measurement & Data

2.MD.D.10 - Represent and interpret data.

Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1), (K-2-ETS1-3)

Common Core State Standards for Mathematics

Mathematical Practices

MP.2 - Reason abstractly and quantitatively

Reason abstractly and quantitatively. (K-2-ETS1-1), (K-2-ETS1-3)

Common Core State Standards for Mathematics

Mathematical Practices

MP.4 - Model with mathematics

Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3)

Common Core State Standards for Mathematics

Mathematical Practices

MP.5 - Use appropriate tools strategically

Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3)