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# Engineering Design Examples

# K Building a Tall Tower - an Engineering Design Challenge

This Engineering Design Challenge is intended to help students apply the concept of gravity in an engineering design challenge.

[Building a Tall Tower - an Engineering Design Challenge This Engineering Design Challenge is intende ... (cpalms.org)](https://www.cpalms.org/PreviewResourceLesson/Preview/37741)

# 1 Properties of the Sun

These two lesson plans provide projects that allow students to 1) design, create, and test shade structures using given materials (connecting to the engineering design process) and 2) explore harmful and beneficial properties of the Sun through observing the effects of exposure or non-exposure of certain materials to sunlight and heat.

[Properties of the Sun These two lesson plans provide projects that allow students to 1) design, crea ... (cpalms.org)](https://www.cpalms.org/PreviewResourceUpload/Preview/13347)

# 2 The Perils of a Plant: Watering Can - An Engineering Design Challenge

This Engineering Design Challenge is intended to help students apply the concepts of life cycles from SC.2.L.16.1 (Observe and describe major stages in the life cycles of plants and animals, including beans and butterflies), the understanding that all living things have basic needs from SC.2.L.17.1 (Compare and contrast the basic needs that all living things, including humans, have for survival), a knowledge of habitats from SC.2.L.17.2 (Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs) and practice working with money (MAFS.2.MD.3.8 solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately) as they build and experiment with containers to meet the water needs of bean plants in all stages of their life cycle. It is not intended as an initial introduction to these concepts.

[The Perils of a Plant: Watering Can - An Engineering Design Challenge This Engineering Design Challe ... (cpalms.org)](https://www.cpalms.org/PreviewResourceLesson/Preview/37027)

# 2 Animal Sanctuary Engineering Design Challenge

This Engineering Design Challenge is a hands-on investigation in both math and science. Students will be able to use prior knowledge and problem solving skills to solve non-routine problems and real-world situations, using mathematical and scientific models. It is a great way to introduce your students to real-world problem solving. Students will be engaged in hands-on learning by designing and creating an enclosure for zoo animals. Both math and science standards have been incorporated for an integrated lesson.

[Animal Sanctuary Engineering Design Challenge This Engineering Design Challenge is a hands-on invest ... (cpalms.org)](https://www.cpalms.org/PreviewResourceLesson/Preview/44936)

# 3 Watch Me Sprout...Watch Me Grow, Grow!

During this engineering design challenge, students will create a container to help a local nursery grow sunflowers efficiently. Students will use their knowledge of plant growth to develop a strategy and choose which materials would be best for their sunflower's growth.

[Watch Me Sprout...Watch Me Grow, Grow! During this engineering design challenge, students will creat ... (cpalms.org)](https://www.cpalms.org/PreviewResourceUpload/Preview/153078)

# 4 Honey Bee Human--an Engineering Design Challenge

This Engineering Design Challenge is intended to help students apply the concepts of pollination from SC.4.L.16.1 as they design an apparatus that will pollinate a field. It is not intended as an initial introduction to this benchmark.

In this Engineering Design Challenge, students will make a 2-dimensional model (a graphic illustration) rather than build a prototype.

[Honey Bee Human--an Engineering Design Challenge This Engineering Design Challenge is intended to he ... (cpalms.org)](https://www.cpalms.org/PreviewResourceLesson/Preview/35585)

# 4 Save Our Sand--An Engineer/Design Challenge

This Engineering Design Challenge is intended to help students apply the concepts of weathering and erosion from SC.4.E.6.4 as they build devices to stop beach erosion. It is not intended as an initial introduction to this benchmark.

[Save Our Sand--An Engineer/Design Challenge This Engineering Design Challenge is intended to help st ... (cpalms.org)](https://www.cpalms.org/PreviewResourceLesson/Preview/30463)

# 5 Natural Builders - STEM Engineering Design Challenge

In this lesson, students will investigate and explain balanced and unbalanced forces as they design a building for Miami Beach that is inspired by Florida's natural environment. In this challenge/lesson, students must design a building model that is at least thirty centimeters tall, features two elements that move in the wind, and can also withstand the wind.

[Natural Builders - STEM Engineering Design Challenge In this lesson, students will investigate and e ... (cpalms.org)](https://www.cpalms.org/PreviewResourceUpload/Preview/154102)

# 6-8 Inland Flood Protection Using Levees-An Engineering Design Challenge

This Engineering Design Challenge is intended to help students apply the concepts of protecting human life from hazardous weather from SC.6.E.7.8 as they build levees to prevent flooding. It is not intended as an initial introduction to this benchmark.

[Inland Flood Protection Using Levees-An Engineering Design Challenge This Engineering Design Challen ... (cpalms.org)](https://www.cpalms.org/PreviewResourceLesson/Preview/30761)

# 6-8 Thirst of a Nation

In this inquiry activity students will be engineers that are tasked to design, build, test and evaluate a prototype to filter water.

[Thirst of a Nation In this inquiry activity students will be engineers that are tasked to design, bu ... (cpalms.org)](https://www.cpalms.org/PreviewResourceLesson/Preview/26836)

# 6-8 Wind Farm Design Challenge

This  lesson is a problem-based learning activity aligned to Florida's math and science standards. In this middle-school engineering design challenge, students are asked to create the most efficient wind turbine while balancing cost constraints. Students will apply their knowledge of surface area and graphing while testing 3D-printed wind farm blades. In the end, students are challenged to design and test their own wind farm blades, using Tinkercad to model a 3D-printable blade.

[Wind Farm Design Challenge This lesson is a problem-based learning activity aligned to Florida's mat ... (cpalms.org)](https://www.cpalms.org/PreviewResourceUpload/Preview/174789)

Gr 9-10 Adaptations in Everglades Ecosystems, Lesson 2: Design A Perfect Beast

Students will be able to identify abiotic and biotic factors of an assigned Everglades ecosystem, discuss how these factors influence adaptations, and identify structural and behavioral adaptations that help organisms survive in their ecosystem.

[Gr 9-10 Adaptations in Everglades Ecosystems, Lesson 2: Design A Perfect Beast Students will be able ... (cpalms.org)](https://www.cpalms.org/PreviewResourceUpload/Preview/164850)

# 9-12 Bottled Up Energy

This experimental design project deals with real life understanding of being assigned a group task, creating a budget, and providing evidence about the completion of the assigned task. The task in this case is that students are being asked to create a model of a car out of supplied materials and to test these designs. After each trial the students will analyze the data collected and make any improvements that are necessary. The teams will test all modifications and after analyzing the results of their trials, they will create a presentation to the class on how their design performed.

[Bottled Up Energy This experimental design project deals with real life understanding of being assig ... (cpalms.org)](https://www.cpalms.org/PreviewResourceUpload/Preview/152511)