

Home for a Penguin

Unit Overview



DESIGN CHALLENGE:

How can we design, test and improve our prototype of a penguin habitat?

ANCHORING PHENOMENON:

A penguin can live in the St. Louis Zoo, which can be very hot in the summer.

STORYLINE

In this unit, students learn how scientists and engineers work together to solve problems as they engage in the Science and Engineering Practices. The project for this unit is to design a new zoo habitat for emperor penguins that will meet the needs of the penguins and the zoo visitors. The activities in the unit also emphasize the Crosscutting Concepts of Patterns, Cause and Effect, and Energy and Matter.

First, students learn about the needs of penguins by reading a book and watching habitat webcams. Then, they learn about the work of scientists and engineers as they prepare to take on the role of scientist and engineer to design their penguin habitat.

Next, students take on the role of scientist as they study material properties and determine the best uses for materials based on those properties. They perform several investigations to discover how heat can change materials and determine which materials make the best insulation. Students consider how matter changes and figure out how insulation is made from sand and recycled glass.

Finally, students take on the role of engineer as they use the scientific knowledge gained in the previous lessons to select materials and create a design for their habitats. They work in teams to build and test a prototype of the habitat and use the results of testing to inform their redesign. Once they are finished with the project, they disassemble their habitat and use the materials to make something new.

OVERVIEW

Section 1 <i>What do we need to know to design a zoo habitat?</i>	Section 2 <i>How do we discover the best materials for our habitat?</i>	Section 3 <i>How can we design, test and improve our prototype of a penguin habitat?</i>
Total Time: 5 days LESSON 1 What animal will live in our habitat and what do these animals need? LESSON 2 How do scientists and engineers work together to solve problems?	Total Time: 10 days LESSON 3 How do we describe material properties and use properties to make decisions? LESSON 4 What makes matter change? LESSON 5 How can we make sure that solid ice doesn't melt in our habitat?	Total Time: 10 days LESSON 6 How do we combine our knowledge about penguins' needs and the materials we have to design and build the best habitat? LESSON 7 How do we test our habitat and use the results of testing to improve our design? LESSON 8 How can we use old materials to make something different?

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