**DESIGN CHALLENGE:**

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

---

**STORYLINE**

In this unit, students will 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 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 will learn about the needs of penguins by reading a book and watching habitat webcams. Then, they will learn about how we will need the work of scientists and engineers by comparing and contrasting the two professions.

Next, students will learn to study material properties and how to determine the best uses for materials based on those properties. They will perform several experiments to discover how heat can change material properties and determine which materials make the best insulation.

Finally, students will use the scientific knowledge gained in the previous lessons to select materials and create a design for their habitats. They will 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 will disassemble their habitat and use the materials to make something new.