Museum of Science®

EiE®

OUT-OF-SCHOOL SETTINGS | GRADES 3–5

Shake Things Up: Engineering Earthquake-Resistant Buildings

Unit Overview

In 2010, a powerful earthquake destroyed homes and devastated communities in Haiti. Now our fictional, world-traveling brother and sister duo, Jacob and India, are there learning how to support and protect buildings to better withstand the force of an earthquake. Jacob and India guide kids as they engage in hands-on activities developing their understanding of how to engineer earthquake-resistant, model buildings. Kids will also establish building codes to help others build earthquake-resistant structures.

Engineering Application/Unit Goals

Guided by the Engineering Design Process, kids will become earthquake engineers as they work together to engineer a solution to an earthquake engineering challenge. Earthquake engineers develop and use strategies that minimize the effects of earthquakes on structures. They use shake tables to model how their earthquake-resistant designs respond to vigorous shaking. In this unit, kids explore these strategies and use their own shake tables along with special earthquake magnitude meters to inform the design of model buildings in earthquake-prone areas.

Engineering Adventures®

Engineering Adventures engages learners in grades 3-5 in fun, creative problem solving. Eleven hands-on units are low-cost and flexible to meet the time and budget constraints of out-of-school settings, including afterschool and summer camp. Each unit centers on meaningful, open-ended problems with a global context. Learners find out more about the role engineering plays in their lives and the world around them as they're introduced to real engineering challenges and asked to design solutions with an engineering design process. Throughout each unit, kids learn to collaborate, communicate, solve problems, and share their solutions with their peers.

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Engineering Adventures®

Unit Map

Prep Adventure 1: What is Engineering?

Kids engineer a tower and are introduced to the Engineering Design Process as a problem-solving tool.

Prep Adventure 2: What is Technology?

Kids explore the idea that they, as engineers, can design and improve technology.

Adventure 1: A Shaky Situation

Kids are introduced to the problem: how can we stop buildings from being damaged during an earthquake?

Adventure 2: Building Skeletons

Kids explore how earthquakes impact buildings of different heights and shapes.

Adventure 3: Stop the Slide

Kids engineer ways to stop their buildings from sliding off of the shake table.

Adventure 4: Getting Braces

Kids engineer ways to stop their buildings from changing shape during a test on the shake table.

Adventure 5: Create an Earthquake-Resistant Building

Groups plan, create, and test their buildings on the shake table.

Adventure 6: Improve an Earthquake-Resistant Building

Groups improve their initial designs, test them, and finalize their building codes.

Adventure 7: Engineering Showcase

Groups present their final designs and share their knowledge of the Engineering Design Process.

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