Educator Guide

Twelve lesson plans for grades K–12

The *Dream Big* Educator Guide integrates engineering into the classroom curriculum. Inspired by the *Dream Big* film, each lesson plan focuses on two or more of the Next Generation Science Standards and the Engineering Design Process. Students learn to define a problem, gather information, plan, engineer a solution, test, refine, and evaluate. They will also explore crosscutting principles. Each activity will reference the NGSS standards, making it easy for teachers to match their curriculum needs.

Lesson 1: Kindergarten
Reach for the Skies
Investigate the force of gravity on buildings in natural disasters.
Topics: Natural hazards, forces and motion, weather, climate

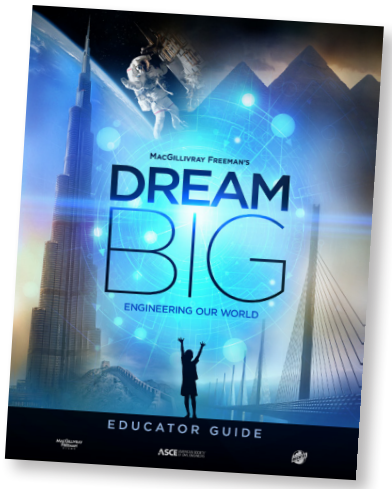
Lesson 2: 1st Grade
Daylight in a Bottle
Harness solar energy to light a room.
Topics: Electromagnetic radiation, refraction, use recycled materials

Lesson 3: 2nd Grade
Surviving Storm Surge
Build a paper-based house to withstand a storm-surge.
Topics: History of earth, earth's materials and system, tides, weather

Lesson 4: 3rd Grade
Maglev Train
Design a magnetic train.
Topics: transportation, convert energy from one form to another, magnetic objects

Lesson 5: 4th Grade
Wind-powered LED
Design a wind turbine to power on an LED.
Topics: energy transferr, alternative energy sources

Lesson 6: 5th Grade
Take Out the Trash: Cleaning Our Rivers
Design a way to eliminate trash that threatens a river.
Topics: Relationships in an ecosystem, water filtration



Lesson 7: 6th Grade
Desert Island Desalination
Turn saltwater into fresh water through desalination.
Topics: Electromagnetic radiation, structures and properties of matter, develop a model

Lesson 8: 7th Grade
Building the Pyramids
Determine how Egyptians moved giant stones.
Topics: Team work, Forces and motion, ancient cultures and mythologies

Lesson 9: 8th Grade
Water Purification Device
Design a portable water purification device.
Topics: natural hazards, and natural resources, water filtration, the water cycle

Lesson 10: High School Chemistry
Making an Impact on Habitat
Create a safe way to neutralize the byproduct of a factory.
Topics: Engineering in the real world, runoff from pollution, runoff from mining, reduce impact of human civilization

Lesson 11: High School Life Sciences
Endangered Species
Engineer a method to support a local species and its future sustainability.
Topics: ecosystem dynamics, functioning, and resilience, biodiversity and humans, environmental niche and adaptive biology

Lesson 12: High School Physical Sciences
LED Holiday Card
Design a greeting card that illuminates two LED lights.
Topics: Convert mechanical energy to radiant energy with aesthetics, design, electromagnetic field, circuits, electricity