

Totally Trebuchet

Academic Representative



Technology Education Concepts
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Description

The trebuchet was the main weapon used during sieges in the Middle Ages; these weapons were capable of hurling huge boulders over castle walls and into fortresses. In this curriculum, students will learn about the properties that affect the operation of a trebuchet. They will learn how energy is transferred from the counterweight to the projectile, and how the release angle and velocity affect the range of the projectile. Then, students will construct a trebuchet and learn how the design parameters and the size of the trebuchet and counterweight affect trebuchet performance. At the end of this curriculum, students organize and participate in a trebuchet game and learn how to accurately target a trebuchet, and they also construct a trebuchet capable of hurling an object a minimum of 20 ft.

SOLIDWORKS Education Edition or SOLIDWORKS Premium Edition are required and sold separately.

Skills

- Construct a trebuchet capable of hurling a projectile a minimum of 20 ft.
- Explain engineering design formulas.
- Explain how mass, weight, and density are measured.
- Build a trebuchet.

Knowledge

- Accurately and precisely target a trebuchet.
- Use formulas to determine the performance of trebuchet models.
- Explain how stress and strain affect the trebuchet axle.
- Explain how energy is transferred from the counterweight to the projectile.
- Calculate the slope of a line from a given pair of coordinates.

Activities

- Activity 1 - Introduction
- Activity 2 - Mass, Gravity, Weight, and Density
- Activity 3 - Work, Potential Energy, and Kinetic Energy
- Activity 4 - Trebuchet Construction
- Activity 5 - Engineering Models
- Activity 6 - Trebuchet Mechanics
- Activity 7 - Engineering Design
- Activity 8 - Analyzing the Trebuchet I
- Activity 9 - Analyzing the Trebuchet II
- Activity 10 - Post-Test and Wrap-Up
- Activity 11 - Bonus Activities
- Activity 12 - Challenge
- Activity 13 - Open-Ended Challenge
- Activity 14 - Careers
- Activity 15 - Internet

Standards

Math, Reading, Science

Module Includes:

Student Workbook, Instructor's Manual, Installation CD, Construction Manual, Trebuchet Kit, Toolbox, SOLIDWORKS® Education Edition Software, Hardware Kit, Safety Glasses

Additional kits available in quantities of five and ten (picture shows ten kits).

Requirements

SOLIDWORKS Education Edition or SOLIDWORKS Premium Edition are required and sold separately.

Computer required and sold separately.