

## Mechanical Engineering

### Day 3

#### Lesson Overview

In this lesson, students will be introduced to the field of Mechanical Engineering, focusing on the basic principles of kinetic and potential energy and their applications. They will also explore key steps in the engineering design process, such as brainstorming, prototyping, testing, and improving designs. The hands-on activity challenges students to build a mousetrap car.

#### Lesson Objectives

**By the end of this lesson, students will be able to:**

- Understand and explain what mechanical engineers do.
- Identify and describe kinetic and potential energy with examples.
- Apply steps from the engineering design process (brainstorming, prototyping, testing, and iterating) to a hands-on project.

#### Vocabulary

1. **Force:** A push or pull upon an object resulting from its interaction with another object.
2. **Friction:** The resistance encountered when one surface or object moves over another, affecting motion.
3. **Motion:** The action or process of changing position or moving from one place to another.
4. **Wheel Diameter:** The distance across the wheel, which affects how fast and far the wheel travels in one rotation.

#### Lesson Plan


##### MECHANICAL ENGINEERING PRESENTATION



**Learn | 10 min**

**Objective:** Provide an overview of Mechanical Engineering, its applications, and introduce key concepts like kinetic and potential energy.

**Materials:** PowerPoint Presentation ("Day 3 - Mechanical Engineering.pptx")

	<p><b>Topics covered:</b> Mechanical Engineering profession, kinetic and potential energy, engineering design process.</p>
<p>MOUSE TRAP CAR</p> <div>  <p><b>Apply   35 min</b></p> </div>	<p><b>Objective:</b> Students will work in teams to build a mousetrap car using provided materials and apply the engineering concepts they learned.</p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• Cardboard</li> <li>• Dowels/Skewers</li> <li>• Mouse trap</li> <li>• String</li> <li>• Laser-cut wood wheels or CDs</li> <li>• Hot glue guns and glue sticks</li> </ul> <p><b>Instructions:</b></p> <ul style="list-style-type: none"> <li>• Divide students into groups of 3-4.</li> <li>• Each team receives materials for building a mousetrap car.</li> <li>• Provide an example build to give students a starting point.</li> <li>• Encourage students to think about factors that could affect the car's performance, such as wheel diameter, friction, and string length.</li> <li>• Guide the teams without directly helping them build, allowing them to problem-solve and experiment</li> </ul>

## MOUSETRAP CAR COMPETITION



**Compete | 10 min**

**Competition:** Set a target point ~3m away from a start line. The team whose car stops closest to the point wins.

### **Instructions:**

- Ensure students understand factors that determine how far the car goes (wheel diameter, string length, friction, etc)
- Hold the competition, evaluating each car's performance based on how close it gets to the designated target.

### [Additional Resources](#)

- Mouse trap car adobe illustrator wheel cutouts if needed