

# RUBBER BAND CAR

CAT# 80-50-W250



The rubber band car is an exciting STEM project that explores resistance, potential energy, and energy conversion. The rubber band car is a simple but effective model designed to demonstrate the conversion of potential energy stored in a stretched rubber band into kinetic energy, which propels the car forward. When the rubber band is twisted and then released, it unwinds, transferring its stored energy to the wheels of the car, causing it to move.

## PRIMARY DIVISION: GRADES 1-3

### Overall Expectation: STEM, Structures and Mechanisms Focus

Explore structures and mechanisms, including the roles of materials in supporting structures and making devices work.

### Specific Expectation

Identify and describe the purpose of simple machines such as levers and pulleys.

### Activity

Students use the Rubber Band Car to understand how potential energy is stored in the twisted rubber band. They can explore different sizes, amounts and elasticity of

rubber bands to see how it affects the amount of potential energy stored.

## JUNIOR DIVISION: GRADES 4-6

### Overall Expectation: STEM, Structures and Mechanisms Focus

Investigate the principles of forces, energy, and control in simple machines and structures.

### Specific Expectation

Explore the relationships between the components of simple machines and the forces acting on them.

### Activity

With the Rubber Band Car, students investigate the concept of potential energy and how it converts into kinetic energy. They experiment with different weights of the car and rubber band tension to observe changes in potential and kinetic energy.

## INTERMEDIATE DIVISION: GRADES 7-8

### Overall Expectation: STEM, Structures and Mechanisms Focus

Investigate how technological problem-solving meets human needs and leads to innovation.

### Specific Expectation

Analyze the impact of friction and lubrication on the efficiency of mechanisms.

### Activity

Students use the Rubber Band Car to explore factors affecting its performance, such as friction. They experiment with different materials for wheels and axles to reduce friction and increase the efficiency of energy transfer from the rubber band to motion.

## SECONDARY DIVISION: GRADES 9-12

### Overall Expectation: Physics Focus

Apply principles of physics to understand the operation and efficiency of mechanical systems.

### Specific Expectation

Analyze mechanical advantage and efficiency in simple and compound machines.

### Activity

Using the Rubber Band Car, students delve into concepts of potential and kinetic energy, as well as mechanical advantage. They calculate the potential energy stored in the twisted rubber band and discuss how efficiently it is converted into kinetic energy to propel the car forward.

## CROSS-CURRICULAR CONNECTIONS

### Mathematics

Students can calculate potential energy using mathematical formulas based on the size and elasticity of the rubber band.

### Technology

They explore different designs and materials for optimizing the rubber band car's performance.

### Language Arts

Students can write reports or presentations on energy conversion principles and their applications in various engineering fields.

### Summary

By experimenting with the Rubber Band Car, students engage in hands-on learning experiences that deepen their understanding of mechanical principles while meeting curriculum expectations. It encourages critical thinking and fosters curiosity in STEM disciplines.