



# MOUSETRAP VEHICLES

Read how teachers and students are finding success with Pitsco Education products in their classrooms

At Streamwood High School in Streamwood, Illinois, high school teacher Greg Reiva initiated a mousetrap-vehicle project in his Integrated Physical Science class for high school sophomores. According to Reiva, the class was studying physics, kinematics of speed, and velocity, so utilizing mousetrap vehicles was a good fit for a hands-on project that applied real-world understanding of net forces and their effects on acceleration.

## PROFILE »

**SCHOOL:** Streamwood High School

**LOCATION:** Streamwood, IL

**TEACHER:** Greg Reiva

**GOAL:** To construct and test a mousetrap vehicle and to maximize vehicle performance



## MR. REIVA WAS ASKED THE FOLLOWING QUESTIONS ABOUT THE PROJECT:

### HOW WAS THE PITSCO PRODUCT USED IN THE CLASSROOM?

In each of the three physical science classrooms there were five to six teams of students working on the construction of the Pitsco mousetrap vehicle. Each team was composed of two to three students performing scientific investigation as the project moved from the construction phase to testing and finally to modifying construction with new independent variables. The goal of the

project was to construct and test the mousetrap car and to maximize vehicle performance. The scientific investigation was intended for students to discover the most important factors that have the greatest influence upon the performance of the car as it is raced down the hallway. Students record data and observations on vehicle performance and apply their greater understanding to compose detailed reports on outcomes they achieved during the testing of the vehicles.

#### **WHAT WERE THE SUCCESSES/CHALLENGES DURING THE ACTIVITY?**

The initial challenge is to successfully construct the mousetrap car given the construction guidelines and performance testing procedures. Students working in groups of two to three people collaborated and cooperated to complete construction and to perform testing. Each student brings their unique skills and abilities to the group to help complete the project and obtain project outcomes.

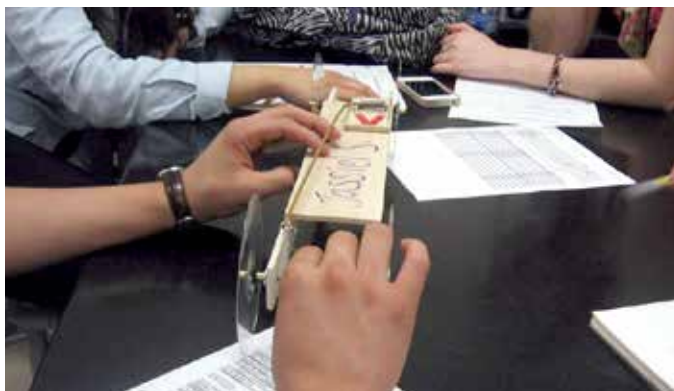
After the construction phase, students must set up an experimental apparatus that will facilitate testing and attaining data and observing time, distance, velocity, acceleration, and force.

The successful operation of the mousetrap car requires a number of important features such as the wheel's unwavering rotation, the steady release of the energy from the axle-wound string, and the steady release of the spring tension energy from the mousetrap.

#### **WHAT EDUCATIONAL VALUE DID THIS ACTIVITY AND PRODUCT BRING TO THE STUDENTS?**

The mousetrap car challenge provides a unique opportunity to create a project-based assessment tool for teachers where students can showcase their skills and abilities to solve problems based upon both science and engineering. The mousetrap car challenge helps initiate an effort by students to engage in science and to solve problems.

Students gain a sense of autonomy as they construct and then design experimental methodologies to test the vehicle for performance criteria. Students gain a sense of achievement as they work toward a goal of determining the proficiency of the car. This experience helps students to develop the abilities to work collaboratively and cooperatively, to commit to the attainment of goals, and to be open to the suggestions of others during both the construction phase and the testing process.



“ I LIKED THAT YOU HAD TO MAKE THE CAR YOURSELF AND EACH CAR WAS DIFFERENT IN THE CLASS. I LEARNED THAT NOT ALL CARS HAVE TO RUN ON FUEL. ”

– Darius, 10th-grade student

Overall the project helps to instill within students both perseverance and resilience that is expressed as innovative thinking and as inventive thought. These are the hallmark qualities needed to be developed by individuals to be successful in the 21st century.

#### **HOW DID THE STUDENTS INTERACT WITH/RESPOND TO THE PRODUCT AND ACTIVITY?**

From the beginning of the project, students working in groups of two to three people collaborated on the design and construction of the mousetrap car. Each student in the groups contributes their particular expertise to the construction process. It takes a unified effort by all members to create an acceptable prototype model.

The prototype model takes form as students access the material and construction resources to fashion the car together. Students work the problem as they put the parts together and create a working unit. Various conditions and requirements must be met as the car takes shape and performs. From this experience, the students become experts in the operation of the car as they perform tests. Different measures must be taken to ensure that the car operates at peak performance during testing.

The students take ownership of this inquiry process of investigation and scientific analysis. Students gather important experimental data that help to determine the level of performance and to compare and contrast their cars with other vehicles.

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