

Stomp Rockets

Class Lesson: Projectile Motion

Objective: At the end of the activity, students should grasp the concept of projectile motion and understand the kinematic equations. Specifically, students should understand that the vertical and horizontal coordinates are independent of each other. Students should also be able to confirm/predict the results of the activity using the kinematic equations.

Variables to Determine: Initial Velocity, Horizontal Distance, Initial Angle

Equipment to be used: stomp rocket set, 3 different sets of weights, two photo-gates, photo-gate stands, photo-gate controller, 100-ft or longer tape measure, tool for measuring angles, a yard stick,

Activity Instructions:

1. Setup the rocket to the specified angle.
2. Setup the photo-gate. Position the photo-gate so that the light signal is in front of, but not blocked by the nose. Optional: Setup a second photo-gate for the purpose of redundancy.
3. Connect the photo-gate to the controller.
4. Drop the weight on the diaphragm to launch the rocket.
5. Measure the horizontal distance traveled using the tape measure.
6. Determine the initial velocity by dividing the length of the rocket, by the "blocked" time indicated on the photo-gate controller.
7. Using the data collected, calculate the "theoretical" values for the following: horizontal distance, initial velocity, initial velocity on the x-axis, initial velocity on the y-axis.
8. Complete the answer sheet.