Ohio Standards Connections:

Grade 12 Physical Science

Benchmark D.

Apply principles of forces and motion to mathematically analyze, describe and predict the net effects on objects or systems.

Grades 12; Grade Level Indicator

5. Use and apply the laws of motion to analyze, describe and predict the effects of forces on the motions of objects mathematically.

Lesson Summary

The students will gain an understanding of Newton's Laws of Motion through variety of activities and lab experiments.

Duration:

160 minutes

Commentary

Part of a 12th grade physics unit.
Students can identify Newton's three laws of motion.
Students have familiarity of science probes to measure force and acceleration.
Students will have familiarized themselves with lab safety procedures and emergence equipment.

Pre-Assessment

Ask students to construct a graph plotting predicted impact of the force vs. acceleration of a paint ball after being shot at a target. Keep graphs as an entry in their science notebooks.

Scoring Guidelines

Check graphs for proper entry and understanding with class discussion.

Post-Assessment

Will be in the form of a written lab assessment that illustrates Newton's three laws of motion.

Scoring Guidelines

See attachment

Instructional Procedures

1. Pre-Assessment

2. Using the computer, find various web sites to demonstrate Newton's laws of motion as a class demonstration.

3. Leaving a foot gap, hang a sheet or towel from the wall. Have the students throw various objects, such as eggs, baseball, tennis ball, spongy ball and so forth at the towel. Discuss the differences in the impacts and how they could be displayed on a graph. Ask the students how we could measure the forces caused by such impacts.