

Subject: Science

Grade: Eleventh - Physics

Standard: #9 Common Themes

Key Concept: Understanding how things work and designing solutions to problems of almost any kind can be facilitated by systems analysis

Generalization: Principles of physics can help us understand everyday phenomenon.

Background:

Students have studied mechanics and properties of matter. As a comprehensive check for understanding about these principles, students will be placed in groups according to readiness. Their task is to analyze the given phenomenon, demonstrate it, and identify and explain all the physics principles involved. The results must be shared with the class. The presentation style is left to the group but must include both demonstration and explanation.

Many books and materials will give directions for these phenomena. One that is quite comprehensive in both the directions for the demonstration and the explanation of why it works is How Things Work: The Physics of Everyday Life, by Louis Bloomfield (ISBN: 0-471-59473-3).

This lesson is tiered in *content* according to *readiness*.

Tier I: *Basic*

Pulling a Tablecloth from a Table Set with Dishes (Laws of Motion)

Tier II: *Grade Level*

Swinging Water Overhead in a Bucket without Spilling the Water
(Acceleration, Circular motion)

Tier III: *Advanced*

The Cartesian Diver (Density, Pressure)

Assessment:

Teacher observation and student interviews during the investigation will serve as formative assessments. Summative assessment includes accuracy of explanation and successful demonstration of the phenomenon. Students' presentation skills may be assessed with a rubric. If possible, you might wish to consider sharing the demonstrations with younger students.