



Drexel-SDP GK-12 ACTIVITY

Science

Weather and Aeronautics

Bernoulli's Principle

Grade Level 5

Lesson # 1 of 1

Lesson Dependency

Time Required 1 Day

Summary

Bernoulli's Principle tells us about how something's speed and density affect its pressure. For flight purposes, it's the reason that an airplane can fly when air moves over it quickly. So how does it work? Let's try a few experiments and find out.

Keywords

Air Pressure, Weather, Aeronautics, Properties of Air, Bernoulli's Principle

Educational Standards: 3.5.7, 3.6.7

Engineering Connection

The aeronautics course is intended as a multi-disciplinary course in physics, math and history of aviation. Navigation, forces of flight, principles of flight, history of flight, and environmental factors (including weather and landforms) are specifically investigated. The core curricular items are emphasized, and aviation is considered an underlying theme. The intent is to provide grounding to the curriculum components learned in a typical K-12 school year. Aviation easily generates a lot of excitement among this age group, and as a result, measurable results are expected in these subjects.

Pre-Requisite Knowledge

Learning Objectives

- After this lesson, students will dispel preconceptions about properties of air as a fluid and the existence of forces. Specifically, students are to understand that objects will tend to move in

any fluid from an area of high pressure to an area of low pressure. When altering fluid speed to create areas of low pressure (per Bernoulli's Principle), students will demonstrate that an object's motion in space can be manipulated.

Introduction / Motivation

- Take a piece of paper and hold it up to your lower lip.
- What do you think will happen when you blow over the top of the paper? Why?
- Blow over the top of the paper. What happens?
- Now take the two ping pong balls, tape each one to a piece of string, and hang them from a desk or something else.
- What do you think will happen when you blow between the ping pong balls? Why?
- Blow between the ping pong balls. What happens?

Lesson Background & Concepts for Teachers

The paper actually blows upward when you blow across the top of it. This is not what you might expect. Not only that, but the ping pong balls move towards each other when you blow between them, only moving away if they actually bounce off of one another. So why did this happen?

Bernoulli's Principle says that when something like air or water flows over a surface, it exerts less pressure the faster it goes. You might say that it's going so fast, that it doesn't have time to stop and push on the surface.

References

SynergyLearning <http://cf.synergylearning.org/displayarticle.cfm?selectedarticle=225>

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Date

9/11/2007