

SUGGESTED REFERENCES

■ Perpetual Motion: The History of an Obsession

W.J.G. Ord-Hume
June 1998

■ Jim's Free Energy Page

<http://www.geocities.com/CapeCanaveral/Lab/1287/>

■ Perpetual Motion

Kevin T. Kilty
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NATIONAL SCIENCE EDUCATION STANDARDS

Grades K - 4 and 5 - 8

Unifying Concepts and Processes

Evidence, models, and explanation
Form and function

Science as Inquiry

Understanding about scientific inquiry

Physical Science

Position and motion of objects

Science and Technology

Abilities of technological design
Understanding about science and technology

*Source: *National Science Education Standards, 1996, National Academy Press*

Grades 5 - 8

Physical Science

Transfer of energy

History and Nature of Science

History of science

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SCIENCE SCREEN REPORT FOR KIDS

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PURSUING ENERGY ALTERNATIVES



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Junior Engineering
Technical Society
www.jets.org

SYNOPSIS

What would you think of powering a car using a water fuel cell, a home furnace powered by permanent magnets or a self driven electromagnetic engine with enough power to put a spacecraft into orbit? This is all energy that we wouldn't have to pay for and energy that wouldn't pollute the earth. Not only would free energy change our world but it would end our dependence on having to use so much of earth's fossil fuels.

In this edition of Science Screen Report for Kids, we will take a look at the highly debated topic of free energy. The quest to produce a free energy machine, like the perpetual motion machine, has motivated scientists, inventors, and artists. There are theories that these machines can be powered from antigravity and self driven electromagnetic engines.

CURRICULUM UNITS

- ENGINEERING
- PHYSICAL SCIENCE
- PHYSICS

RUNNING TIME

12:28

BACKGROUND

What if all of our energy needs were totally free? The people behind the quest for perpetual motion machines tend to think that our society would be restructured. Power bills would be nonexistent. Our dependency on fossil fuels would fade. Pollution could see a drastic change as coal, oil, gas, and nuclear power dissolve. Poor countries could rid themselves of famine, and prosper for a change.

However, over time, thousands of promising perpetual motion designs have proven to be failures. A perpetual motion machine is an isolated mechanical device or other closed system without a sustaining energy source. Sometimes, if the premise is to produce excess energy that can be used to power another source, it is referred to as a free energy machine. These inventors still feel that somewhere there is a hidden trick, or way around some laws of physics. Conventional scientists claim that a perpetual motion machine is impossible because of the current laws of physics. Even as their obsession with the subject grows, the skeptics are equally as obsessed with disproving their claims.

This program features several inventors and their free energy machines. Aldo Costa invented a perpetual motion machine which is a wheel. Skeptics say that his one wheel is not enough to generate much power. But if the system were to actually work and if hundreds of wheels in a series could be constructed then it would generate enough power for the world. Still there are skeptics that say it isn't a perpetual motion machine at all.

Another inventor is Jo Newman. He claims that his machine uses no more power than is used to light a bedside lamp. He also claims it can recharge its own batteries. David Hamel created an antigravity machine using spinning discs. So is David Hamel pushing impossible dreams? Maybe, but it is worth noting that NASA is currently working on an antigravity flying disc that is similar to David Hamel's design. An artist, Reidra Finsaud, has a machine that has a harmonious relationship between a ball, magnets, and pendulums. Several scientists looked at the machine and were quite amazed. This machine scored an amazing 80 to 90 percent for efficiency. However, even with this awesome rating, it still doesn't qualify as a perpetual motion machine - it had to score a 100 percent!

ADVANCED ORGANIZERS

Prior to showing this program students should have some understanding of the following Benchmarks for Science Literacy, Oxford University Press, which are excerpted and, in some cases, abbreviated below. Refer to the Benchmarks for more information.

Benchmark 1: The Nature of Science

Section A - The Scientific World View

Know by the end of 2nd Grade

- Science investigations generally work the same way in different places.

Know by the end of 5th Grade

- Results of similar scientific investigations seldom turn out exactly the same. Sometimes this is because of unexpected differences in the things being investigated, sometimes because of the unrealized differences in the methods used or in the circumstances in which the investigation is carried out, and sometimes just because of uncertainties in observations. It is not always easy to tell which.

Know by the end of 8th Grade

- When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, and it often takes further studies to decide. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as correct.
- Scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.
- Some scientific knowledge is very old and yet is still applicable today.

Section B - Scientific Inquiry

Know by the end of 2nd Grade

- When people give different descriptions of the same thing, it is usually a good idea to make some fresh observations instead of just arguing about who is right.

Know by the end of 8th Grade

- Energy cannot be created or destroyed, but only changed from one form into another.
- Energy appears in different forms. Heat energy is in the disorderly motion of molecules; chemical energy is in the arrangement of atoms; mechanical energy is in moving bodies or in elastically distorted shapes; gravitational energy is in the separation of mutually attracting masses.

*Benchmarks can be found at www.project2061.org/tools/benchol/bolinintro.htm

CRITICAL THINKING EXERCISES

- Have students stand up dominoes in a figure eight pattern. Set the dominoes in motion from two different points (once in the same direction of each other, and then in the opposite direction of each other). Have them predict the outcome and discuss the results.
- Divide the students into groups and draw their own ideas for a perpetual motion machine. Have the groups compare ideas and explain why they think certain ideas might work, and why other ideas will not work.
- Write a persuasive essay convincing others that the machine you invented is a working perpetual motion machine.
- How would the creation of a working and proper free energy machine change the world. Chart the ideas. Have students pair off and chose two of those ideas to elaborate on.
- Why do you think the standards and requirements for building a proper perpetual motion machine are so high with it having to score a 100 percent to be efficient?

VOCABULARY

Antigravity The hypothetical effect of reducing or canceling a gravitational field.

Fossil fuel A hydrocarbon deposit, such as petroleum, coal, or natural gas, derived from living matter of a previous geologic time and used for fuel.

Free energy A thermodynamic quantity that is the difference between the internal energy of a system and the product of its absolute temperature and entropy.

NASA National Aeronautics and Space Administration.

Nuclear power Nuclear energy regarded as a source of electricity for the power grid.

Perpetual motion The hypothetical continuous operation of an isolated mechanical device or other closed system without a sustaining energy source.

CAREER POSSIBILITIES

■ CARTOGRAPHER

■ EARTH SCIENTIST

■ ENGINEER

■ GEOLOGIST