



Berkshiremuseum

Playing Around with Simple Machines

Suggested Resources

Print Materials For Students

Gibson, Gary. Pushing and Pulling (Science for Fun). Brookfield, CT: Copper Beech Books, 1995. *Motion-related activities and projects for kids with step-by-step instructions and clear pictures. Each activity also includes a concept introduction and sections explaining “why it works,” and suggesting further ideas for exploration.*

Lafferty, Peter. Force & Motion (Eyewitness). New York: DK Publishing, 2000. *Helpful and abundant photos and illustrations. Covers many physics fundamentals including simple machines and how they have been used throughout history.*

Lauw, Darlene and Lim Cheng Puay. Motion (Science Alive!). New York: Crabtree Publishing, 2002. *Activities and explanations introduce basic physics phenomena like friction, centripetal force, inertia, momentum, speed, and acceleration in kid-friendly language with helpful illustrations.*

Levers and Pulleys (Foss Science Stories Series). Developed at Lawrence Hall of Science, University of California, Berkeley. Delta Education, 2000. *Uses clear text, photos, and graphics to explain the workings of simple machines, including the three different classes of levers. Includes illustrations of real life uses of simple machines and questions for exploration.*

Lipman, Jean. Alexander Calder and His Magical Mobiles. NY: Hudson Hills Publishing, 1981. *Includes biographical information and an exploration of Calder’s artistic process.*

Macaulay, David. The New Way Things Work. Boston: Houghton Mifflin Company, 1998. *Drawings and diagrams show the inner workings of things from the zipper to a saxophone.*

Print Materials For Educators

Friedhoffer, Bob. Toying Around with Science. New York: Franklin Watts, 1995. *Explains the inner workings and physics concepts involved in toys from water guns to yo-yos. It includes chapters on toys that are powered by magnetism, friction, air and water pressure, flywheels, vibration, levers, springs, and wind-up mechanisms.*

Taylor, Beverly A.P. Exploring Energy with TOYS: Complete Lessons for Grades 4 - 8. New York: Terrific Science Press, 1998. *Each lesson includes step-by-step instructions for activities, time and material requirements, key concepts, National Standards, procedures, extension ideas, and suggestions for further reading. The book also includes an overview of the pedagogical strategy used in the lessons, as well as a content review of concepts covered.*

Taylor, Beverly A.P., James Poth and Dwight J. Portman. Teaching Physics with TOYS, Activities for Grades K – 9. New York: Terrific Science Press, 1995. *Physics activities utilizing toys like Lego® construction toys, roller skates, comeback toys, and yo-yos. Designed by college professors, elementary and middle school classroom teachers and science specialists.*

Toler, Dane J. Energy, Machines and Motion. (Smithsonian/The National Academies: National Science Resources Center). North Carolina: Carolina Biological Supply Company, 2000. *Includes lessons on friction, work, motors, pulleys, levers, mechanical advantage, calculating efficiency, motion and energy.*

Tuchman, Phyllis. "Calder's Playful Genius." *Smithsonian* (May 2001), p. 82 – 92. About Calder's career and practices as an artist.

Web Materials for Students

How Stuff Works.

<http://www.howstuffworks.com/>

Explains the inner workings of telephones, toys, refrigerators, clocks, toilets and more.

Inventor's Toolbox: The Elements of Machines.

Developed by the Museum of Science, Boston for The Science Learning Network, 1997. www.mos.org/sln/Leonardo/InventorsToolbox.html

Good images of the simple machines and some common complex machines like worm gears and the crank and rod. A challenge page asks you to identify the mechanisms in gadgets like a hand powered drill.

Web Materials for Educators

Franklin Institute's Spotlight on Simple Machines

<http://www.fi.edu/ga97/spotlight3/> and

<http://www.fi.edu/pieces/knox/automaton/lpsimplemachines.htm>

Descriptions of the simple machines, links to other resources, and lesson plans and activities centered around simple and complex machines and motion at the elementary and middle school levels.

Work is Simple with Simple Machines.

<http://www.ed.uri.edu/SMART96/ELEMSC/SMARTmachines/machine.html>

A Project Smart 96 Unit created by Rhode Island Teachers with the goal of integrating technology into the science and math curricula. Includes activities, key terms, bibliography and links.