

Berkshiremuseum

Alexander Calder: An Artist at Play *Pre & Post Visit Resources*

Important Terms and Concepts *Pre & Post Visit*

Terms: Grades PreK - 2

<u>Alexander Calder</u>	a famous artist well known for pioneering moving sculptures (mobiles) and who created the push and pull toys on display in this gallery.
<u>Wheels</u>	cylinders that can roll and rotate, like the tires on a car.
<u>Mobile</u>	a sculpture that has moving parts. The parts might be moved by moving air or by a motor (using electric power).
<u>Sculpture</u>	art that is not flat like a painting or drawing.

Terms: Grades 3 - 5

<u>Work</u>	a force making an object move a distance.
<u>Force</u>	a push or a pull.
<u>Load</u>	the object that is moved when work is done.
<u>Simple machines</u>	six machines that have been used for thousands of years; the wedge, ramp (inclined plane), screw, wheel and axle, pulley, and lever, which when used, make it easier to get work done. The combination of more than one simple machine is called a complex machine.

Rotating wheel

a wheel that is not fixed to an axle, so that the wheel can rotate while the axle stays still.

Wheel and axle

a wheel that is fixed to an axle so that they rotate together.

Lever

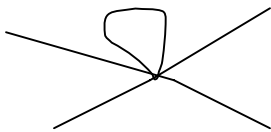
a rigid beam that can pivot at a fixed point (the fulcrum). Some examples of levers include sea saws and windshield wipers. Two or more levers can be joined together. Salad tongs are an example of this. The handles on the push toys in the gallery are also levers.

Activities To Do at School or at Home
Pre & Post Visit

Activities: PreK - 2

Mobiles

Introduce or review Alexander Calder's mobiles. To create the arms of your mobile, fold one pipe cleaner in half. About one inch from the folded end, twist both parts of the pipe cleaner around each other to create a loop.



Then spread out the two loose ends so that your pipe cleaner looks like the diagram on the left. Take a second pipe cleaner and twist it around the bottom of the loop a couple of times and spread the arms so that you now have four

arms that create an X. Bend the tips of each arm upwards. With grades 1 - 2, encourage students to add more pipe cleaners to make a more complex structure. Now you are ready to draw, color, cut out and hang any shapes you would like. Use wire Christmas tree hangers for an easy, no-tie way to add your shapes.

Toys in Motion

Ask students to bring in a toy from home. Ask each student to share their toy with the class. If it has moving parts, talk about how the toy moves and how the parts work together.

Introduce or review Alexander Calder and his push and pull toys. Now it is their turn to be the toy designers! Ask them to imagine a moving toy of their own and to draw a picture of it. They should give their toy a name and be able to explain what all of the parts are and how the toy moves.

Calder Toy Picture Book

Students create a picture book about the Alexander Calder toy exhibit to share with people in their families who may not have been able to come on the field trip. Book contents might include a drawing of the student's favorite toy, information about how it moves (i.e., You pull it and it wobbles around), what machines helped to make their toy move (levers, tilted wheels, regular wheels, etc.) and what students liked best about the exhibit.

Activities: Grades 3 - 5

Simple Machine Scavenger Hunt

Complete the Simple Machine Scavenger Hunt (included at the end of this document) at school, at home, or both.

Problem Solving Challenges

Students will have fun working on these problem solving challenges in small groups. The materials are everyday items and the directions are simple, but the outcomes are completely open-ended. Students may use simple machines to solve these challenges without even knowing what the simple machines are. Have each group do a different challenge, or give each group the same challenge and see how many different solutions your class comes up with. (Full directions are included at the end of this document).

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Suggested Resources

Pre & Post Visit

Print and Web Materials for PreK - Grade 2 Students

Roytson, Angela. The Machines in Action Series including Wheels and Cranks, Pulleys & Gears, Levers, Screws, and Springs. Heineman Library, 2001. *Lots of pictures and clear text. Good for young readers.*

Venezia, Mike. Alexander Calder (Getting to Know the World's Greatest Artists). New York: Children's Press, 1998. *An excellent and thorough introduction to Calder—the man, the artist, and his work.*

Print and Web Materials for PreK - 2 Educators

Hodge, Deborah. Simple Machines (Starting with Science). Kids Can Pree, 1998. *Excellent ideas for fun activities and experiments that you can do with simple, common household materials.*

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.*

Print and Web Materials for Grade 3 - 5 Students

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.*

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.

The Science Learning Network, Museum of Science, Boston, 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.

Print and Web Materials for Grade 3 - 5 Educators

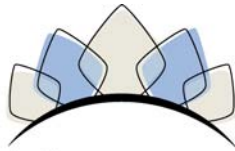
Taylor, Beverly A.P., James Poth and Dwight J. Portman. Teaching Physics with TOYS, Activities for Grades K – 9. New York: Terrific Science Press, 1995. *Physics activities utilizing toys like Lego® construction toys, roller skates, comeback toys, and yo-yos. Designed by college professors, elementary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

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

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.








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Simple Machine Scavenger Hunt

How many simple machines can you find in your everyday life? Find and record the names of objects or mechanisms that contain simple machines.

Simple Machine	Inside	Outside
Lever 		
Ramp 		
Screw 		
Wedge 		
Wheel and Axle 		
Pulley 