



Children's Museum of Houston

Pre/Post Classroom Activities

Compound Machines

Rationale

How Does It Work brings physical science to life through exploration of everyday phenomena by working with simple and compound machines. Questions can be posed and answered through investigations in this exhibit. Children learn that methods, models, and conclusions built from these investigations can change as new observations are made.

TEKS Objectives (Science)

- 4.1A: Demonstrate safe practices during field and laboratory investigations.
- 4.2: The student uses scientific inquiry methods during field and laboratory investigations.
- 4.5A: Identify and describe the roles of parts in nonliving systems-simple and compound machines.
- 4.5B: Predict and draw conclusions about what happens when part of a system is removed.

Background

In grades K-2, children learn to use certain simple and compound tools and they begin to understand that these tools help them complete tasks more easily. In this lesson, children will design and create a compound machine out of recycled materials. A machine is a tool used to make work easier. Simple machines are simple tools used to make work easier. Compound machines have two or more simple machines working together to make work easier. Children will later be able to further explore simple machines in their visit to the How Does It Work exhibit.

Vocabulary

Simple machines	Wheel and axle
Compound machines	Pulley
Inclined plane	Work
Wedge	Force
Screw	Pivot
Lever	Fulcrum

Materials

- Tape
- Glue
- Thumb tacks
- Craft sticks
- Aluminum foil
- Construction paper
- Yarn or string

- Straws
- Variety of recycled materials (cardboard boxes, toilet paper and paper towel rolls, plastic bottles and containers, milk jugs, egg cartons, juice cartons, ice cream containers, etc). Be sure to remind students that they are not to bring glass, sharp metal, or any other possibly dangerous or hazardous materials.

Procedure

1. After reviewing different types of simple and compound machines, challenge your students to first think about a task in their daily lives that would become much simpler if they could use a compound machine.
2. Then students will design and create a compound machine out of various recycled materials and test them out to see if they can be used to help them complete these various tasks.
3. Let your students have time to build and modify their inventions, then have a class-wide contest.

Questions to ask

- What task did you build your compound machine to help you complete a task? What types of simple machines did you incorporate into your compound machine to make this task simpler?
- What steps did you take in designing and creating your compound machine?
- What types of problems or concerns did you come across when designing your compound machines? How did you overcome these problems or concerns?
- How did using two or more simple machines help you to complete a task more efficiently?

Resources

- How Do You Lift a Lion? by [Robert E. Wells](#). Provides a simple introduction to the use of levers, pulleys, and wheels to move heavy objects.
- Experiments with Simple Machines by [Salvatore Tocci](#), [Robert Gardner](#), [Susan Virgilio](#). Describes various kinds of simple machines.
- Sensational Science Projects with Simple Machines by [Robert Gardner](#). The experiments in this book will show how simple machines work.
- Ancient Machines: From Wedges to Waterwheels by [Michael Woods](#), Mary B. Woods. Discusses the invention of six simple machines in various ancient civilizations from the Stone Age to the fall of the Roman Empire.

Websites

- BrainPop: <http://www.brainpop.com/technology/simplemachines/>. In these movies about the different types of simple machines, Tim and Moby explain how these machines help us to do things more easily.
- Pieces of Science: <http://www.fi.edu/pieces/knox/automaton/simple.htm>. Provides descriptions for the six different simple machines, and goes on to explain how automatons and robots work.

- Edheads: <http://www.edheads.org/activities/simple%2Dmachines/>. Edheads is a resource that provides science lesson plans for teachers to use. In this lesson, students will be able to react with an animation about common household machines and then complete a scavenger hunt to identify simple machines and compound machines that are used in their everyday lives.