



Connection to the Arts: “Miming Machines”

Simple Machines Module

This hands-on activity provides students with the opportunity to further explore the properties of simple machines. They will work in small groups to wordlessly act out the operation of several simple machines.

This offline hands-on activity can be completed after participation in the online Engage, Explore, and Explain.

Teacher objective: To reinforce how simple machines may be used make work easier.

Student objective: By completion of this activity, students will be able to act out and describe simple machines that help make everyday tasks easier.

Estimated time for activity: 20 minutes

Materials:

- Problem cards, one to two per group

Procedure:

1. Review simple machines with students.
2. Tell students that mime is a form of acting performed without words or props. When they mime, they will tell a story with only their own bodies and actions.
3. Divide students into groups of three or four. Each group will receive one to two problem cards which present a problem that can be solved by one or more simple machines.
4. Each group must decide how they would solve the problem with simple machines. Then, they must decide how they will present their problem and their solution to the class using mime.
5. Circulate to help students with reading problem cards, brainstorming solutions, and conveying actions wordlessly.
6. Gather the class. After each group mimes a problem and solution, the class will guess both the problem and the type(s) of simple machine they used to solve the problem.

Teacher background & discussion points:

Science is made up of concrete concepts that often utilize technical language. While it is important for students to understand the terminology, research has found that those who are able to draw a connection between the concepts and their own experiences develop greater understanding. By providing students with differentiated science experiences through the arts, we can foster their creativity and provide a better understanding of scientific concepts. This “Connection to the Arts” activity provides students with an innovative approach to science as they experience a variety of learning styles such as dance, music, art, poetry, and theater. Providing diverse opportunities for students to experience science will engage all students, including those who may respond more favorably to nontraditional instruction.

In this activity, students will use their knowledge of simple machines to mime solutions to problems involving force and motion. This activity illustrates that problems moving objects and doing other work can be solved by using simple machines. It is important for students to



recognize the ways in which simple machines can help make work easier. By engaging students' problem solving skills and kinesthetic learning through mime, students can make new connections between simple machines and making work easier.

Use the following questions to emphasize the scientific connection to this art activity.

- What is the work being done?
- What machine or machines are helping with the work?
- How do the machines make the work easier?
- What did you like about the activity?
- Did you find miming difficult?

Review:

At the conclusion of the lesson, remember to review the following key points:

- Simple machines are used every day to make work easier.
- Simple machines reduce the force needed to move an object over a distance.
- Examples of simple machines are a lever, a pulley, a screw, an inclined plane, a wedge, and a wheel and axle.

Accommodations:

If students have difficulty planning their mime, a variety of accommodations can be employed.

- The teacher can read problem cards aloud to each group.
- The teacher can show a short video clip of a mime at work to show how actions can be demonstrated without words or props.
- The teacher can aid in brainstorming solutions.
- The teacher can aid in practicing/developing a mime performance.
- The activity can be completed with science buddies from an older grade.



“Miming Machines” Problem Cards

(Note: Problems are matched with one type of simple machine that could form a solution, but students may find different simple machines or combinations of simple machines to solve the problem.)

Key		
lever	There is a heavy rock right where you want to plant flowers. You can't get your fingers under it to lift it up. How will you move it using a simple machine?	You started to hammer a nail into a board, but the nail bent. You need to take out the bent nail, but you can't pull it out with your fingers. How could a simple machine help you?
inclined plane	Your new house has a fort in the backyard. The doorway is a few feet off the ground and has a ladder to reach it. That means that your brother can't get his wheelchair in the fort. What simple machine could help you play together in the fort?	The new park in town has a skateboard park. It is a big, flat cement area. Kids aren't using the skateboard park because it's not much fun. What simple machine could you include to make the skateboard park great?
pulley	You need to get a piano onto the second floor of a building. The piano won't fit up the stairs. There is a large window on the second floor that the piano could fit through. What simple machine could help you move the piano?	It is your job to raise the United States flag to the top of the flagpole. The flagpole is three times your height. What simple machine could help get the job done?
screw	You are a waiter in a restaurant. It is your job to serve a bottle of wine to the people at table four. The bottle is sealed with a cork. What simple machine would help you open the bottle?	You are building a birdhouse to hang outside. You want to attach the roof pieces to the wooden sides. What simple machine will help hold the birdhouse together?
wedge	It is a windy day. Your door keeps blowing shut. What simple machine would help keep the door open?	It is cold. You want to build a fire to warm the house, but the wood is in huge logs. What simple machine could help you split the wood into smaller pieces for the fireplace?
wheel and axle	You are helping your family in the garden. Your grandmother wants a lot of heavy rocks moved from one side of the yard to the other. What simple machine could help you do the job?	You are shopping at the grocery store. You have too many groceries to carry by yourself. What simple machine would help you finish your shopping?



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