

Simple Machine Exploration and Search

Overview: Students will learn to see, identify, play with, and name six simple machines. This lesson plan could be extended over three to five days. It will culminate with walking through the school and or community and using the FLIP camera to photograph simple machines. The movie can then be narrated by the students' voices or communication devices.

Procedure: Students will play with simple machines at stations set up in the classroom. You do not need to have the exact same toys as I use; this just gives you some ideas. If you have a STEM teacher (Science, Technology, Engineering, and Mathematics), s/he may be a valuable resource as well. If you do not have enough adult help, perhaps only do 2-3 stations per day until they are all completed. It is important at each station for the adult to teach the real name of the simple machine that students are using and experiencing.

Station 1: Marble rollers (inclined planes) - you can use wooden or plastic marble rollers. I also use Frigits, build your own magnetic marble roller:
<http://www.funkyfridge.com/TH-6222.html>

Station 2: Tool bench with a hammer (lever) - If you have enough supervision, you can have students actually hammer nails in a wooden plank. Another idea is to put flower petals between two pieces of paper and hammer the petals to do "petal pounding." You will have a beautiful picture underneath!

Clothespins are levers, too. Use the Web site below to find activities to laminate that require a student to "clip" the answer.
<http://www.makinglearningfun.com/themepages/DinosaurLiteracyIdeas.htm>

Station 3: Screws (You might use spice containers with screw on tops for the wrist strengthening practice of taking them on and off.)

Provide nuts and bolts for students to match and screw together by size.
http://store.schoolspecialty.com/OA_HTML/ibeCCTpItmDspRte.jsp?section=28468&item=32192&minisite=10206&pschli=50AAXRI4iG3WE63jjMSAf2Wp:S&pschli_pses=ZG251EB2B1537BF8AD65E2C8C36AB2C38C90F10A38421A69FB7F68A084BA101DA0711AC7900731670BD2B2A6EC0025F79C5DE3F8B4B040DCEF

I have my students put batteries in flashlights from Oriental Trading. They can screw the flashlight lids on and off.
http://www.orientaltrading.com/ui/search/processRequest.do?Ntx=mode%2Bmatchallpartial&Ntk=all&Ns=GROSS_MARGIN|1&Ns=GROSS_MARGIN|1&requestURI=searchMain&N=0&No=0&Ntt=flashlights

Create a Design and Drill Toolbox from Educational Insights.

https://store.schoolspecialty.com/OA_HTML/xxssi_ibeSearchResults.jsp?type=search&searchType=productResults&minisite=10206&query=tool+kit

Station 4: An adult (an assistant, a parent, a practicum student, or volunteer) will walk the students to the flagpole to learn how to put the flag up and down. The students will have the opportunity to work the stage curtain and observe the pulley.

Station 5: Wedges - with supervision, use the following knife for students to learn about how to safely cut fruit. Notice how the handle is away from the blade.

<http://www.parsonsadl.com/details.php?prod=918>

Scissors are also a type of wedge. Draw shapes on cardstock for your students' abilities and have them cut out the shapes.

Station 6: Wheels and Axles - set up ramps and have your students use Matchbox cars or other toy cars to see how fast they go.

After students have experienced the stations, read the book, *Lance the Dragon Defends His Castle with Simple Machines* by Eric Braun.

Either the same day or the next day, read the book again, covering up the name of the simple machines. Place the book on the ELMO and have students identify the simple machines as they appear in the text. Fill in the following grid. If you have a small class, you can even do this with each individual student for documentation.

| Simple Machine | Use (pushing the correct button on the communication device) |
|----------------|--|
| Inclined Plane | |
| Pulley | |
| Wedge | |
| Inclined Plane | |
| Screw | |
| Wheel and axle | |
| Lever | |
| Lever | |
| Wheel and axle | |
| Wheel and axle | |
| Screw | |
| Wheel and axle | |

E-books from Sylvan Dell e-books also offer some great choices of books to incorporate, *The Fort on Fourth Street: A Book about Six Simple Machines* by Lois Spangler.

For the culminating activity in this lesson, walk the students around the school or around the community with a FLIP camera. Students would take turns identifying simple machines and FLIP videoing the machines. A slide on the playground is an inclined plane as is the wheelchair ramp into the building. Each month, take students on the public transit buses to visit residents and bowl with them at a retirement center. Discuss that the buses have wheels and axles. The driver uses a lever to open the door. Note the screws that hold the bus seats together. Go to a restaurant for lunch, note that the drink machine has a lever. The doorknob is a wheel and axle, etc. bring along FLIP cameras and have students take turns with the camera creating their own movie.

ASOL Covered in this Activity:

3S-FME 3 The student will investigate and understand simple machines and their uses.

Key concepts include:

b) types of simple machines

5S-SI 1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which

b) objects or events are classified and arranged according to characteristics or properties.

l) models are constructed to clarify explanations, demonstrate relationships, and solve needs.

5S-SI 2 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which

j) models are constructed to clarify explanations, demonstrate relationships, and solve needs.

Extension Activities

5E-WP 6 The student will:

a) use technology to produce and share writing

Extension Idea:

Classroom Suite can be used with Intellitools Activity Exchange. There is an activity where students can construct simple sentences about simple machines.

http://aex.intellitools.com/searchdetails.php?act_key=simplemachineserrorlesswr

Using Word put sentence beginnings and endings together and have students build sentences that make sense. The sentences created can be as long or short based on

students' abilities. Sentence strips with Boardmaker pictures can also be used.

HS-C1 The student will apply the traits of a good citizen by:

f) participating in classroom decision making through voting

Extension Idea:

After the lesson, have students vote on which simple machine they think is the most useful. Use chart paper with the grid lines drawn. Provide pictures of simple machines and then give the students sticky dots to use in order to vote.

3E-CN2 The student will:

b) identify a detail of a nonfiction text

Extension Idea:

As books about simple machines are read to the students, they can give a characteristic (a detail) about the simple machine they heard about.

Materials Needed: marble rollers; tool bench with a hammer; hammers, nails, wood, paper, flowers; spice containers with screw on lids; nuts and bolts; child's drill and screwdriver set; safe knives, cutting board, and fruit; scissors, cardstock, and markers; ramps, cars; FLIP camera; chart paper with grids and sticky dots; *Lance the Dragon Defends His Castle with Simple Machines* by Eric Braun.

Instructional Setting: Special education classroom or inclusive general education science class

Community Connections and/or Peer Interaction: Using Peer Pals to assist in the classroom to investigate the toys and simple machines. Invite, the general education third grade to see the stations creating a shared hands on experience of using simple machines. This could be a wonderful opportunity for reverse inclusion.

As students take trips out into the community, they can identify simple machines in everyday settings.

Functional Activity/Routine: Many of the activities that involve screwing or cutting strengthen the wrist. This in turn assists with better handwriting and skills for dressing. Field trips in the community help the students view these tools in real use.

Strategies to Collect Evidence: A grid can be used during the reading of a book or as the FLIP movie is watched to record what simple machines the student can identify. Create a picture sort using pictures of simple machines and labels, have students sort the pictures into the correct category. Program a voice output device with items to classify,

take data on student responses.

Specific Options for Differentiating this Activity: Students who cannot speak may need their communication device programmed so that they can identify simple machines as well as their characteristics. Pictures as well as words may be used. Provide modified scissors to meet individual student needs.