

A close-up photograph of a LEGO Technic assembly. It features two parallel grey Technic beams connected by a black axle. Yellow pins are used to secure the beams. The assembly is shown at an angle, demonstrating its mechanical structure.

for grade levels 3 – 5

ACTIVITY 1: THE STORY OF LEVERS

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The Rube Goldberg Challenge

After viewing the first video on Rube Goldberg Machines you should now have a solid understanding about levers. Use the video as a jumping off point to explain the parts of a lever and the different classes of levers.

Objectives

(*Science*) Describe the different parts of a lever and understand that those parts have a purpose to help the lever operate.

Lesson Flow

1. Show your class Enable Education's E3 video about Levers.
2. Have a group discussing about levers.
Prompts:
 - How did that lever work?
 - Can you think of an example of a lever you use every day?
3. Have a further discussion with the class about the 3 parts of a lever. Introduce the *fulcrum*, *resistance (load)* and *effort*. Have your students take a ruler and an eraser and model for them what a fulcrum and effort look like. Give your students the challenge of finding the heaviest object in their desk they can lift using this lever.
4. Go back and reference the Enable Education video. Explain and point out the fulcrum, resistance and load.
5. Once you feel there is a good understanding of the 3 parts of levers, introduce the 3 classes of levers to the class.
 - *First Class Lever*: Fulcrum is between the effort and the resistance
 - *Second Class Lever*: Resistance is between the fulcrum and the effort
 - *Third Class Lever*: The effort is between the resistance and fulcrum.

Materials/Preparation

- Computer
- Projector or large screen
- Art supplies
- Worksheet
- Rulers
- Erasers
- A Doll
- Scissors
- Hammer
- A Wheel Barrow
- A Crowbar
- A Stapler
- A Broom
- A Baseball bat

Classroom Accommodations

Some students may find the explanations of levers to be more challenging than others. While students are working monitor your class and help those that need the extra attention. Take the time to do some one-on-one instruction and bring some manipulatives to the students work station so they can work through and see the parts of a lever first hand.

Make sure to monitor student's answers by watching them work and listening to their reasoning.

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Use the ruler and eraser lever to have your students model each class of lever.

6. Have a number of objects available (see below) for your students to sort into First, Second and Third Class levers.
 - *First Class Levers:* A doll elbow, scissors, a hammer
 - *Second Class Levers:* A wheel barrow, a crowbar,
 - *Third Class Levers:* A stapler, a broom, a baseball bat
7. Once you feel the class has a firm grasp of the concepts of the Classes of Levers, have the class find five examples of each class of lever. Have them write down their examples. Give them time in class and if they do not finish, have them take their assignment home.
8. Once the students have completed their task, have them present their ideas.
9. Create three charts on the board that list examples of each class of lever for the class to see.

What's Next?

- ▶ Have your class determine which type of lever is best suited for various jobs. Students should use examples from their community and other mediums. (*Science*)
- ▶ Your class will have presented multiple examples of Classes of Levers. Have your students extend the lesson further by having them draw their favorite example of a class of lever. Display some images of Leonardo Da Vinci's sketches to use as inspiration on how to draw their favorite class of lever. Have the students label the 3 parts of their lever in their drawing. Display the artwork in the class when students are finished as a reference point for further simple machine lessons. (*Visual Art*)