

MISSION MISSION POSSIBLE

IMAGINE. DESIGN. CREATE.



MISSION : Lever Up

Your mission is to build a something that will help you lift a can of food with only one finger!

WHAT YOU'LL NEED

- One full food can (a can of soup, vegetables or soda)
- A long, rectangular and flat object (a ruler, paint stirrer or piece of wood, etc.)
- A small, thick and rectangular object (a deck of cards, TV remote, block, bar of soap, etc.)
- Optional: Something to write with and paper to draw on



LET'S READ

Find a comfortable spot and read! Here are some ideas to get you started:

- *Levers* by David Glover
- *Machines We Use* by Sally Hewitt
- *Levers* by Chris Oxlade
- *The Magic School Bus Plays Ball: A Book About Forces* by Joanna Cole

You can download digital copies of these books for free from openlibrary.org. Here is how!

1. Go to openlibrary.org.
2. Click the blue "sign up" button on the top right to create a free account. You will be sent a confirmation email.
3. Sign in.
4. Type the book title and author into the search bar.
5. Find your book and click the blue "borrow" button.
6. Don't forget to return your book when you are finished reading it!



Sam Noble Home



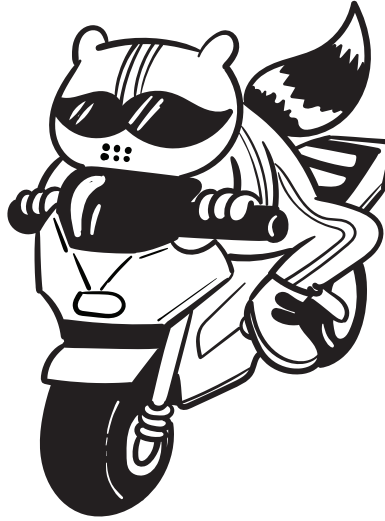
For more activities visit samnoblemuseum.ou.edu/samnoblehome

Get Started:

- 1) Pick the area where you are going to work (on a table, on the floor, etc.)
- 2) Gather the can and other materials.
- 3) Try to completely lift the can off the ground using only one finger.
What happened?
- 4) Look at the two objects and can:

THINK!

- How heavy is the can?
- Why can't you lift it with only one finger?
- How can you use the materials to lift the can?
- Will you need any other materials?
- Not sure where to start? Check out the pictures of levers on the next page for some ideas.
- Optional: Draw what you want your design to look like!



5) Build it!

6) Once you have built your design, test it out and try to lift the can.

WHAT HAPPENED?

- Where you able to lift the can completely off the ground?
 - Did the can fall off or roll away?
 - Did any piece of your design break?
 - Did different parts of your design move when you tried to lift the can?
- 7) Try again! Just because your idea didn't work the first time, doesn't mean you should give up. Think about how you can change your idea to build something so that it will be able to lift the can completely off the ground. Be creative and try as many times as you want. Ask a partner for ideas if you've tried all of yours or check out the next page if you need some hints. for ideas if you've tried all of yours. (If you need some hints, check out the next page.)

When you're done, share what you did with someone!

TELL THEM

- Did your design lift the can off the ground on the first try?
- How did you change your design to better lift the can?
- How many ideas did you try?
- What was hard about the challenge?
- If they wanted to try the challenge, what should they do?

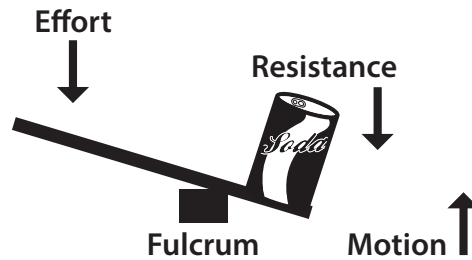
BONUS CHALLENGE

Now that you've built a lever to lift the can, see if you are able to:

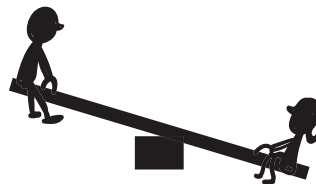
- Lift something heavier than a can off the ground. Try lifting a large book, a gallon jug or something even heavier (like a person)!
- Try to build a lever that not only lifts the can but can move an object from one place to another.
- Challenge a partner to make a lever and see which lever can lift the heaviest object.

Did you know a lever is a type of machine? Machines are all around us, making our lives easier by solving problems and doing jobs. A machine doesn't have to be something complex to help us. Levers are examples of a simple machine, which are basic devices that use force, or effort, to accomplish a job. There are only two parts in a lever: the bar (the long, flat part that applies the force) and the fulcrum (the fixed part on which a lever moves). Using these two parts, levers change how force is applied. While the force from your finger might not be enough to lift a can by itself, a lever will help make that same force, or effort, stronger. Check some different kinds of levers you may have seen in action:

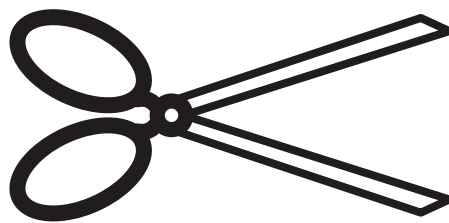
Lifting a can:



Seesaw:



Scissors



HELPFUL WORDS

Bar: the long, flat part of a lever

Effort: the force applied to a lever

Force: the push or pull applied to an object

Fulcrum: a fixed point that the lever moves around

Lever: a simple machine made of a rigid bar and a fulcrum that changes how force is applied

Load: the weight a lever moves

Resistance: the force applied by the load

Simple machine: a basic device that accomplishes a job by applying force



TIPS

- Try making a lever: Place the long, flat object over the small, thick object (like a seesaw.) Press down on one side to lift the other!
- Make sure your fulcrum (the small, thick object) can't move when you're using it.
- Try changing where the fulcrum is on your lever. Placing it closer to or farther from the can may make a difference.
- If the can keeps falling off, try building a basket or container on one end of the lever to keep it in place.
- For heavier loads, try making the bar (the long, flat object) of your lever stronger or larger.

Talk like a lever engineer!

1. My lever is a simple machine that uses force to solve a problem.
2. Levers are made of a bar and a fulcrum.
3. The force I pressed down on the bar with one finger was called the effort
4. The fulcrum of my lever was in between the load and the effort.
5. My lever works by moving the load in the opposite direction (up) that the effort was applied (down.)

Want to learn more about levers? Check out the links below:



Super Simple Machines: Levers (video)

<https://www.youtube.com/watch?v=lueqE0lxLyc>



Difference between Levers (video)

<https://www.youtube.com/watch?v=5M98hS8M9hl>



Read about Simple Machines

<https://www.generationgenius.com/simple-machines-reading-material/>



Simple Machines

<https://oeta.pbslearningmedia.org/resource/idptv11.sci.phys.maf.d4ksim/simple-machines/support-materials/>



Sam Noble Home



STEM
Activities

