

# Simple Machines Exploration

Free play with levers, pulleys, and conveyor belts allows for experimentation and discovery. Many children are amazed by how a simple machine, which has very few moving parts, can make work a lot easier!

## Try It

1. Set up a sandbox area or simply a large box filled with sand, pebbles, rice, beans, or other material that's safe for the children to handle.
2. Allow children to explore moving the materials using toy trucks (front loaders, backhoes, etc.), buckets, and shovels.
3. Consider placing a dowel with a pulley system attached to it across the top of your boxed-in area. Have children try out the pulley system and ask if it's easier or harder to lift the bucket with the pulley than without.
4. Provide materials for making levers, such as pencils, popsicle sticks, spoons, rubber bands, tape, etc. Invite children to build a catapult and experiment with this form of a lever. Have on hand various soft items that can be launched. Whatever you use, enable children to play, and test to see whether the length of the lever or where the fulcrum is placed makes a difference in how far the load can be launched.
5. If you have access to a small conveyor belt, demonstrate turning the crank to move the loads from one side to the other and back again. Place a basket or bucket on the end of the conveyor belt and have children experiment with moving things along the conveyor belt and having them land inside the bucket or basket.



### TINY TIP!

Relating a lever to a teeter totter can be helpful as you explore!

## Learning Opportunities

The main concept is that “Machines can make work (pushing, pulling, lifting, or hauling) easier.” Basic engineering and physics principles, like balance and force, as well as math concepts related to weight and distance, become real for the children through hands-on exploration coupled with discussion.





**Book Recommendation:**

*How Do You Lift a Lion?* by Robert E. Wells.

## Open-Ended Questions

- How can we lift something that weighs more than we do?
- How can we make a simple machine to move something without using our muscle power?
- What can you design to move an object?
- What does a conveyor belt do?
- How does a catapult work?
- How does a pulley work?
- How does a lever work?

## WORDS AND CONCEPTS TO EMPHASIZE

- Balance
- Leverage
- Pulley
- Fulcrum
- Lever
- Conveyor belt
- Weight (heavy vs. light load)
- Load distribution (too much on one side or another)
- Counting (how many pieces can be moved at one time)
- Distance (how far one item gets when catapulted and which item went farther)