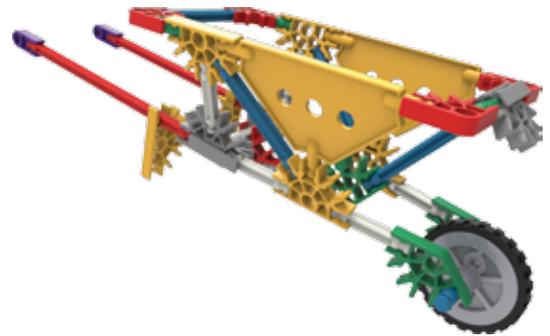


Experiment #2

79319

Make Lifting a Load Easier

Objectives: Demonstrate how the wheelbarrow functions as a 2nd Class lever and how it can be modified to make lifting a load even easier.

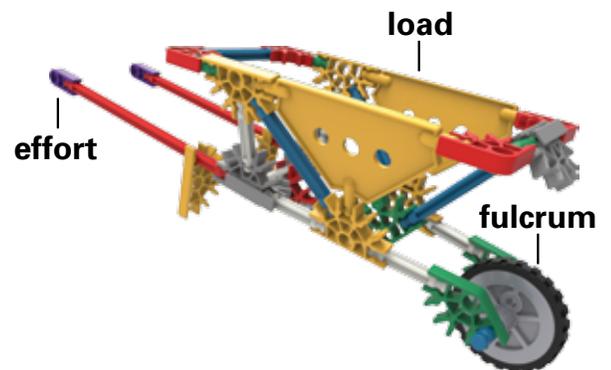


Materials You Will Need:

- built **WHEELBARROW** model
- a few extra K'NEX pieces
- marker
- small stickers or pieces of masking tape
- large pile of washers, smaller paper clips or pennies
- a large pile of washers, smaller paper clips or pennies
- a piece of aluminum foil or plastic wrap, approximately 6 x 8 inches (15 x 20 cm)
- paper or a notebook

PROCESS:

1. Build the **WHEELBARROW** model by following the step-by-step building instructions.
2. Using small stickers or pieces of masking tape, identify the **fulcrum**, **load**, and **effort** of the wheelbarrow model.
3. Identify which class of lever the wheelbarrow belongs to and why.
4. (a) Collect a large pile of washers, paper clips or pennies and carry it across your room in one hand only.



(b) Was it hard to carry these loose items in your hand? Did any fall out on your way across the room?

(c) If you managed to carry the loose items without dropping anything, do you think that would have been possible if you had been provided with a large handful of sand?

5. (a) Get a sheet of aluminum foil or plastic wrap.

(b) Line the tray of the K'NEX wheelbarrow with the aluminum foil or plastic wrap. Fill the tray with the pile of washers, paper clips, or pennies. Then use the wheelbarrow to lift, move, and dump the load. Make sure you dump the load over the front of the wheelbarrow, not the side.

(c) What did you notice about moving the pile of material with the wheelbarrow? What kinds of loads would be easiest to move in a wheelbarrow and why?

(d) Imagine that you have to provide someone who has never used a wheelbarrow with precise instructions for its use. In your notebook record step-by-step what they need to do.

6. (a) An even heavier load needs to be moved. What changes could be made to your present design to allow it to move this heavier load without increasing the effort needed to lift the handles? Using extra K'NEX pieces, change your wheelbarrow to make it easier to lift the load.

(b) What did you do to your model to make it easier to lift the load?

(c) Why did you choose to do that?