

UNIT 6: FORCE

ACTIVITY 30: PUSH AND PULL

Goal: To understand that force is a push or a pull

Skills: Observing, estimating, comparing, using observations to support inferences

Materials: 3 or 4 classroom objects different enough in weight so that students can easily order (classify) them from lightest to heaviest, for instance:

rubber band
pencil
box of paper clips
box of crayons
books of different weights

Preparation: Put the objects on a table where all students can see them.

Preparation Time: 5 minutes

Lesson Time: 25–30 minutes

— Procedure and Questioning Strategy —

Have a couple of students come up to the table and lift the objects one at a time.

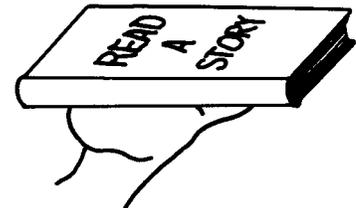
1. What differences do you feel when you lift the objects?

Some are heavier (or lighter) than others.

2. How do you know that?

Some are harder (or easier) to lift than the others.

3. Decide together how to arrange these objects in order from lightest to heaviest.



When the objects are arranged in this order, ask two other students to lift each object, in order from lightest to heaviest, to find out if they agree with the classification.

4. When you move something by lifting it, you are using force. A force is the strength used to lift something up, move it toward you, or push it away from you.

Demonstrate these movements.

5. When did you use the most force (strength) to lift an object?

When I lifted the (name of heaviest object).

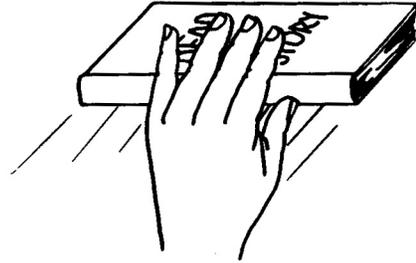
6. How do you know that?
It was the hardest to lift.

Have two other students push each object across the table.

7. Which was the hardest to push?
The (name of heaviest object).

8. Which was the easiest to push?
The (name of lightest object).

9. Which object did it take the most force to push?
The (name of heaviest object).



10. When we use force to push or pull, we say we are *exerting* force. Hold up one of your books by putting your hand under it. Are you exerting a force that is a push or a pull?
A push.

11. In which direction are you exerting your force?
I'm pushing upward, against the book.

12. Is the book exerting a force against your hand?
Yes.

13. How do you know that?
It feels heavy. It's pushing down against my hand.

14. What do we call a push or a pull?
A force.

15. When we use force, what do we say we're doing?
Exerting a force.

— Connections With Everyday Life —

Have the students name objects at home, school, or elsewhere, or things they use, that they either push or pull. Make two lists, one for PUSH and one for PULL. For example:

*PUSH — doorbell button, computer keys, bike pedals, instrument keys, door to close
PULL — rope in tug of war, venetian blind or curtain cord, lawn mower starter cord,
light or ceiling fan cord, drawer to open*

*Some objects can be included in both lists, like drawer listed above. Make sure students name some things that can **only** be pushed and some that can **only** be pulled.*