

Name \_\_\_\_\_  
Period \_\_\_\_\_

Date \_\_\_\_\_

# Simple Machines

## PART I

### Materials:

30 cm ruler

10 blocks

Pencil

### Objective:

To construct a lever and balance it.

### Procedure:

**A.** Lay down the pencil flat on the desk.

**B.** Lay the ruler across the pencil so that the two ends of the ruler teeter back and forth like a seesaw.

**C.** Adjust the ruler on the pencil so that the two ends balance perfectly. **What was the balance point? (1a)**

**D.** Stack 5 blocks at the very edge of the ruler on the 1 cm (1 in.) side and the other 5 blocks on the very edge of the 30 cm (12 inch) side. Place the ruler on top of the blocks. Since the two piles of blocks are about equal in weight, the two ends of the ruler should remain balanced.

**E.** Take three blocks off of the 30 cm (12 inch) side and place them on the stack at the 1 cm (1 inch) side. You should now have 8 blocks on one side and 2 on the other. **Which class of lever did you make? (1b)**

### Challenge

Without adding any weight to either side and without moving the blocks, can you figure out how to get the two ends of the ruler to balance? (Note: The ruler doesn't have to balance exactly — it just needs to be at the point where it teeters back and forth without touching the desk.)

### Questions:

1a. Draw the lever that you balanced in the challenge.

1b. Describe how you were able to balance the lever with the blocks stacked unevenly.

## **PART II**

### **Materials:**

Yard stick with an object attached  
5 textbooks

### **Objective:**

To see which fulcrum location requires the least amount of work.

### **Procedure:**

- A. Place the yard stick and weight on the textbook. **Do NOT** move the books once the experiment begins.
- B. With the weight at the bottom, place the yard stick on the books at the 32 inch mark and lift the weight. Make a mental note on the effort required.
- C. Now, place the yard stick at the 27 inch mark. Make a mental observation. Place the yard stick at the 22 inch mark making a mental observation. Finally, place the yard stick at the 16 inch mark, making a mental observation.
- D. Draw all four levers and label the effort, load, and fulcrum.

E. Which lever required the least amount of work (circle the drawing)? Why do you think this lever was more efficient than the other levers?

F. Which class of lever did you use?