

# Measuring Forces

**Main Idea:** \_\_\_\_\_

## ELASTIC MATERIALS:

You can use an \_\_\_\_\_ when pulling or pushing an object, and measure how far it \_\_\_\_\_.

## THE TOOLS TO USE: (use handout)

List the effect of the force in each picture. Then tell how you would use the effect to measure the force amount.

- a) Effect: \_\_\_\_\_  
To Measure Force: \_\_\_\_\_
- b) Effect: \_\_\_\_\_  
To Measure Force: \_\_\_\_\_
- c) Effect: \_\_\_\_\_  
To Measure Force: \_\_\_\_\_
- d) Effect: \_\_\_\_\_  
To Measure Force: \_\_\_\_\_
- e) Effect: \_\_\_\_\_  
To Measure Force: \_\_\_\_\_

Newton (N): \_\_\_\_\_

One Newton is equal to: \_\_\_\_\_  
\_\_\_\_\_

## **OUTPUT: MAKING A FORCE METER**

**Materials:** cup hook, cardboard tube, wooden dowel paper clips, rubber bands, masking tape, pen.

1. Place a piece of tape on a wooden dowel.
2. Calibrate the force meter:
  - a. Attach the spring scale to the force meter.
  - b. Hold the spring scale still while pulling the cardboard tube until the spring scale reads 1N.
  - c. Draw a line at the end of the cardboard tube. (this is the 1N line)
  - d. Pull slightly harder until the spring scale reads 2N. Draw the line.
  - e. Repeat until you reach 15N.

## **USING THE FORCE METER**

Measure the force needed to lift the following objects:

500g mass: \_\_\_\_\_ N

2 pound weight \_\_\_\_\_ N

book with string \_\_\_\_\_ N

### **Questions:**

1. What is a Newton? \_\_\_\_\_
2. How many Newtons of force does it take to lift:
  - a. 100g? \_\_\_\_\_
  - b. 200g? \_\_\_\_\_
  - c. 400g? \_\_\_\_\_
  - d. 450g? \_\_\_\_\_
  - e. 750g? \_\_\_\_\_