



Name: _____ Date: _____

How Can We Measure Forces?

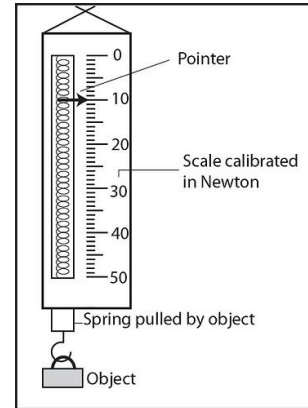
Part I: Introduction to the Newton

1. Observe as your teacher applies a force on the bathroom scale. What is the weight, in pounds, that registers on the scale?
Answers will vary depending on the amount of force you exert on the scale, but we will use 5 pounds as an example.
2. Convert the amount of weight from pounds to the amount of force in newtons. Remember 1 lb (pound) = 4.45 N (newtons).

Answers will vary depending on the amount of force you exert on the scale; however, for 5 pounds, the answer would be 22 N.

3. Imagine a small child stepping on the scale, resulting in a weight reading of 35 pounds. How many newtons does the child weigh?

154 N



Part II: Practice Using a Spring Scale

Procedure:

1. Use a spring scale to measure the force of gravity for bags A, B, and C. Record your results in the data table below.
2. Use a spring scale to measure the amount of force needed to pull each bag of sand across a tabletop or desktop. Record your results in the data table below.
3. Use a balance to determine the mass of the bags, and record it on the data table.

Bag	Force: Pull of Gravity on Bag (Weight)	Force: Pull Required to Drag Bag	Mass: Amount of Matter in Each Bag
Small	1 N	0.25 N	100 g
Medium	2 N	0.5 N	200 g
Large	3 N	0.75 N	300 g



Explore

Questions:

1. What is the difference between weight and mass?

Weight is a force that depends on gravity; mass is not.

2. What is the relationship between mass and weight?

Objects with more mass have more weight.

3. Use your data to predict what a 400g bag would weigh.

4 N

4. What is the relationship between the mass of an object and the amount of force required to drag it across the table?

An object with a greater amount of mass will require more force to lift and move than an object with less mass.

5. Based on your data, how much force do you predict a 400g bag would require to be pulled across the table?

1 N