

Activity Two: Measuring the Force of Gravity

Part I: Measuring Weight

A spring scale may be used to measure the weight of an object. Remember, weight is the pull of gravity down toward the Earth's center. Let's look at some ways to measure that downward pull no matter where the object is located.

Materials: Ring stand, 100g mass, 500g mass, two springs, two "S" hooks, spring scale, triple beam balance, two rubber bands

Attach two rubber bands to the ring stand. Hook one mass to each rubber band.

1. What happens to the rubber bands when the weights are attached? _____

2. Did the rubber bands stretch equally? Why or why not? _____

Now attach the two springs to the ring stand using the "S" hooks. Hook one mass to each spring.

3. In what way did the springs act similarly to the rubber bands? _____

4. In what way did the springs react differently from the rubber bands? _____

Both the spring and the rubber band stretch in response to gravitational attraction. The spring and the rubber band that held the heavier masses stretched more because gravity exerts a greater force on heavy objects. As the masses pull down on the spring (because gravity's pulling down on the masses) that stretch occurs.

5. As you know, a spring scale may be used to measure forces, including the force of gravity. How is a spring scale different from the rubber band and the spring you used?

A bathroom scale that is calibrated in newtons is another instrument that can be used to measure weight. When you stand on the scale, a spring inside becomes distorted. The more mass you have, the more gravity pulls you down and the more the spring is distorted.