

## Carts With Spring Balance

### Purpose

The purpose of this activity is to explore a relationship between mass, force, and acceleration.

### Materials

Carts, spring balance, stop watch, meter stick, and tape to mark off distances

### Procedure

1. Select a starting point and mark distances 5, 10, and 15 meters from that point.
2. The student on the cart, must grasp the hook on the spring balance.
3. A second student must grasp the other end of the spring balance and exert a constant force (pull) on the cart rider. On a signal the puller must start dragging the cart rider with a constant force throughout the distance. Repeat this several times for all distances using different skaters and forces.

### Summing Up

1. What effect, if any, did increased travel distance have on the acceleration?
2. How is final velocity related to distance traveled if the force is constant?
3. How does acceleration seem to be related to force?
4. How does acceleration appear to be related to mass?
5. If a 3 N force is applied to the skater and no movement results, how can this be explained?