



**The National Science Center**

## **Classroom Activity**

**Theme:** Motion

**Title:** Weight and Motion

**The National Science Center**

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## Classroom Activity

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**Theme:** Motion

**Topic:** Weight

**Title:** Weight and Motion

**National Standard:** Physical Science Content Standard B. Motion can be measured and represented on a graph. (B. 2. 1)  
Unbalanced forces will cause changes in the speed of an object's motion. (B. 2. 3)

**Purpose:** To explore how weight affects motion.

**Recommended Level:** Grades 5-8

**Time:** 45 minutes

**Materials:**

|                            |  |
|----------------------------|--|
| Ramp                       | Toy trucks (one per group of students) |
| Thick book                 | Lead fishing sinkers                   |
| Triple beam balance        | Meter sticks (one per group)           |
| Stop watch (one per group) | Ping pong ball                         |
| Foam rubber ball           |  |

**Presentation / Procedures:** Hold up a ping pong ball and a foam rubber ball. Ask a volunteer to come up and feel the two to see which is heavier. Weigh both balls to confirm (or simply compare weights on the balance). Ask students what will happen if you place the balls side by side on the table and thump each of them. Ask the students how many think the heavier ball will go farther. Give each of the balls a thump of equal force to determine if they move the same distance or if one of them moves farther than the other.

Set up the ramp with one end on a book (or object of similar thickness) and the other end on the floor. Make sure there is plenty of room for the toy trucks to roll off the end of the ramp. Release a toy truck down the ramp. Observe. Place three lead sinkers in the truck, and release it again. Observe. Ask the students to tell what they noticed from their observations.

Have students work in groups to determine what effect the [weight](#) had on the motion of the truck. Each group should weigh the toy truck and record the weight on their paper. Then place the truck on the ramp, release it, and measure the time it takes the truck to get to the end of the ramp, as well as the distance it travels before coming to rest. After recording this data, add two weights to the truck and repeat the experiment. Then have the students repeat this experiment for 4, 6, and 8 weights. Each group should then construct a graph representing these results.

Lead a class discussion of the results of the experiments. Let students state in their own words what conclusions may be drawn from the data collected by each group and by the class as a whole.



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**Expected Outcome:** The heavier the weight of the truck, the slower the truck will move down the ramp and the less distance it will travel before coming to rest.

### Links:

Links used in this activity:

Weight:

[http://www.eecs.umich.edu/~coalitn/sciedoutreach/funexperiments/agesubject/lessons/other/newton\\_car.html](http://www.eecs.umich.edu/~coalitn/sciedoutreach/funexperiments/agesubject/lessons/other/newton_car.html)

Other links:

<http://nsc10.nscdiscovery.org/motionsounds/BallDrop.htm>

<http://nsc10.nscdiscovery.org/motionsounds/SkateboardPush.htm>

**References:** Hewitt, P. G. Conceptual physics (8<sup>th</sup> ed.). Reading, MA: Addison Wesley, 1998.

**Credits:** *National Science Center Summer Camp Curriculum titled Math and Science: The Totally Cool Combo, Day 4. Activity 4C, Dr. Sam McGaw, November, 1995.*