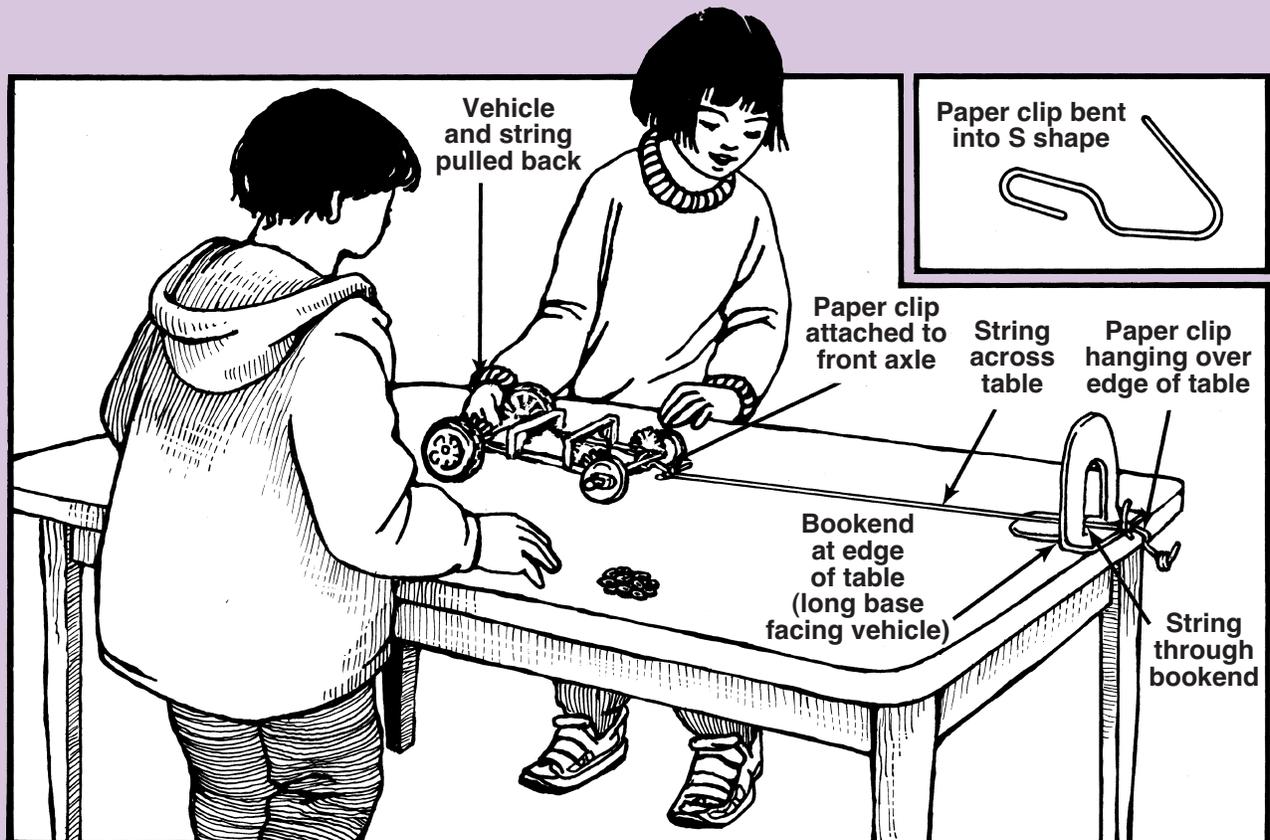


Student Instructions for Setting up a Falling-Weight System

Directions: Pick up your materials. Place your vehicle on the long, flat work space assigned to your group by the teacher. Then set up the work space just as it is pictured.



1. Make certain to thread the string through the opening in the bookend. Have one member pull the vehicle back until the top of the paper clip hook lines up with the top edge of the table. If you are using a long board, pull the vehicle back until the rear wheels are near the end of the board. (Make certain the wheels remain on the board.)
2. While one member holds the vehicle in place, have another member put two small washers on the paper clip hook at edge of the table. Can the person who is holding the vehicle feel this added weight?

3. Now let go of the vehicle. If the vehicle does not move, it may help to tap it *very slightly*. (If it still does not move, you will record that information on your record sheet.)
4. Discuss what you observed. Have the third member record your group's observations on **Record Sheet 3-A: Recording How Our Vehicle Moves**.
5. Pull your vehicle back again until the top of the paper clip hook lines up with the top edge of the table. Place two more small washers on the hook (four total). Discuss what it feels like to hold the vehicle in place with four washers on the hook.
6. Let go of the vehicle. Record your findings on the record sheet.
7. Pull the vehicle back again. Place four more small washers on the hook (eight total). Before you let go, discuss how it feels to hold the vehicle in place with eight washers on the hook. Then make a prediction. Discuss how the vehicle will move. Now let go of the vehicle. Record your findings.
8. Repeat this activity with 16 washers (or 1 large washer).
9. Now complete all of Record Sheet 3-A. Rank the speed of your vehicle when pulled by each weight by assigning each trial a number from one to five, with five being the fastest. Which weight pulled the vehicle the fastest?

Record Sheet 3-A

Names: _____

Date: _____

Recording How Our Vehicle Moves

| Number and Size of Washers | Observations about How the Vehicle Moved | Ranking the Speed (1-5) 1=slowest 5=fastest |
|--------------------------------------|---|---|
| 1 small washer | <i>There was only a small force pulling the car. First it wouldn't start moving. Then it moved very slowly.</i> | |
| 2 small washers | | |
| 4 small washers | | |
| 8 small washers | | |
| 16 small washers (or 1 large washer) | | |

Thinking Challenge: Think about the height of your work space and the length of your string. Think about the distance your vehicle moves. How are all these measurements related? Why?
