

## How to Make a Sticky Tape Testing Apparatus and Conduct the Tests

Step 1 – Setting up a Measuring Device on the Testing Board (materials needed: tape measure or ruler, testing board (approx. 12" x 24"), pen or pencil):

1. Place the tape measure or ruler parallel to one edge of the board, making sure to align the "0 inch" mark with one end.
2. Keeping the tape measure or ruler straight; use your pen to begin placing marks on the board every ½ inch—do this for the entire length of the board.
3. Go back and write the corresponding distance that each mark represents (i.e. 0", ½", 1", 1 ½", etc.). This chart helps you to easily determine the distance that each marble rolls when you begin testing.
4. Note: You may also attach a ruler or tape measure directly to the board instead of writing directly on the board itself.

Step 2 – Adhering the Testing Tape to the Board (materials needed: testing board, scissors, various kinds of tapes, any object that can be used to elevate the board):

1. Elevate the testing board from the table by placing it onto a box (or some other object). Make sure the outer edges of the testing board extend beyond the box by roughly 4 inches on each side – this is necessary to be able to work with the board.
2. Cut 2 pieces of tape roughly 3 inches long and attach them loosely to an outer edge of the board (these will be used shortly).
3. With the adhesive/sticky side facing up, extend a piece of tape all the way across the board and then keep extending for another 4-6 inches past the board. Cut this long piece of tape. This long tape should simply lay face-up across the length of the board (evenly spaced so that 2-3 inches of tape hang off each side).
4. Attach one of the short pieces of tape from Step 2 face-down onto one end of the long tape (Note: leave about half of the sticky side of the short tape exposed so it can be used to fasten the long tape to the board). Secure this end of the long tape to the board by wrapping it around the end of the board and fastening it to the bottom of the board with the remaining sticky portion of the attached short tape.
5. In a similar manner, use the second short piece of tape from Step 2 to attach the other end of the long tape to the other end of the board. Make sure to pull the long tape tight while securing this final end to the board.
6. The adhesive/sticky side of the long tape should now extend face-up and level along the entire length of the board. This is important to ensure accurate results.
7. Repeat steps 2 – 5 for each type of testing tape you wish to use, separating each type by at least 1 inch.

Step 3 – Testing the Tapes (materials needed: objects (e.g. books or blocks) for elevating the angle of the testing board, marbles, and a protractor (optional)):

1. Before beginning the tests, have the students predict which tape will be the stickiest and how far they think the marble will roll down the test track.
2. Every group should test the 0° elevation and approximately the 90° elevation. Note: no objects will be needed for elevating the board for these tests; make sure the testing board is held upright and steady for the 90° test.

3. Place the marble at the 0 inch mark on the testing tape (top edge of the board). Note: the marble should be set lightly on the tape each time the tape is tested. Make sure the students understand that the farther the marble rolls down the testing tape, the weaker the tape is.
4. Assist students to make their own data chart (a sample is given in the worksheet section of the plan). The marble test should be repeated 3 times for each type of tape, at each elevation.
5. Record the distance the marble traveled after each test; find the mean distance for each tape.