

Rubber band stretch

Question: Will it take more effort to pull a heavy load straight up or to pull it up a ramp?

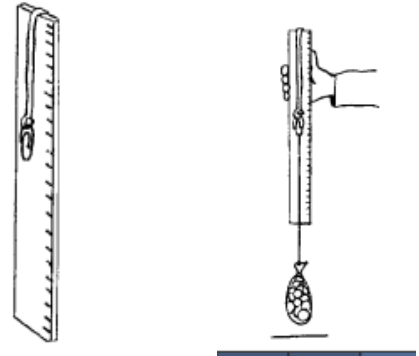
Materials

Rubber band scale

- 1 ruler
- 1 paper clip
- 1 medium weight rubber band
- 1 pair of scissors

Rubber band stretch

- 1 snack-sized Ziploc bag filled with your choice of weights
- 30 cm of string
- 1 art board
- 4-6 1 inch thick books

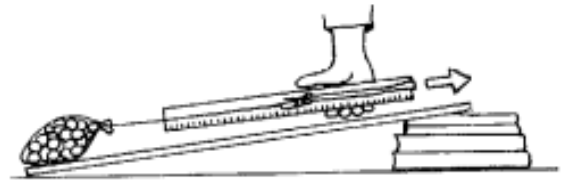


Method: Rubber band scale

1. Make one cut in the rubber band to make one long piece.
2. Tie the rubber band to one end of a paper clip.
3. Hold the paper clip so the tip is at the 9cm mark.
4. Drape the rest of the rubber band along the length of the ruler so it's end hangs over the end of the ruler. (The end with the zero mark.)
5. While holding the paper clip at the 9cm mark, tape the other end of the rubber band securely to the back of the ruler. Don't stretch the rubber band.
6. To use the rubber band scale, fix the load to the paper clip on the scale. Hold the ruler by its edges and let the load pull the rubber band down the length of the ruler. Read the number at the bottom tip of the paper clip. This is your measurement.

Method: Rubber band stretch

1. Put your weights into the snack-sized Ziploc bag and tie it shut with a rubber band. This is your load.
2. Tie one end of the string to the paper clip on the scale.
3. Tie the other end of the string to the neck of the sandwich bag.
4. Stack the books on the end of a table.
5. Place the load on the table and slowly lift it to the height of the stack of books by lifting the ruler (let the rubber band stretch down the front of the ruler).
6. Observe how far the rubber band stretches. Find the number by the top of the paper clip on the scale and record it.
7. Place one end of the board on the books to make a ramp. The other end is resting on the tabletop.
8. Place the load at the bottom of the ramp and slowly move it up the ramp by pulling the scale up the ramp (let the rubber band stretch down the length of the ruler).
9. Observe how far the rubber band stretches. Find the number beside the top of the paper clip on the scale and record it.



Adapted from <http://illuminations.nctm.org/Lesson.aspx?id=1081>