Bungy Jump Energy

You need

- the bungy trials table (see copymaster)
- a small plastic bag
- rubber bands
- a bulldog clip
- a drawing pin
- sticky tape
- marbles
- a computer spreadsheet or graph paper
- a classmate

Activity One

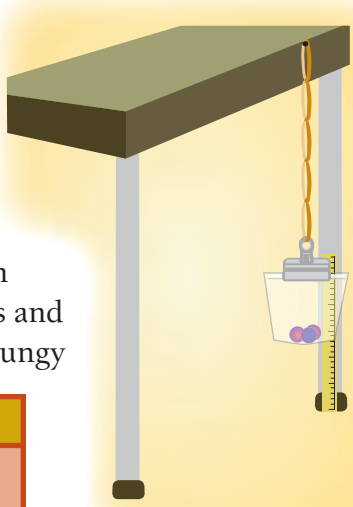
On their next holiday, Henry and his friend David are going bungy jumping.

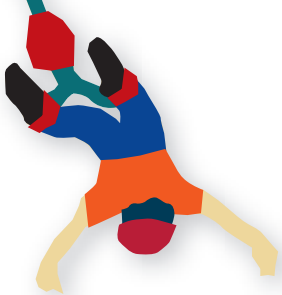
1. Work with a classmate to settle Henry and David's argument:

   a. i. Make a "bungy" using at least 5 rubber bands and a bulldog clip. Put a small sandwich bag in the clip. Fasten the bungy to a desk or table.

   ii. Tape a ruler to the wall or table leg so that you can measure how much your bungy stretches.

   iii. Put different numbers of marbles in the bag. Drop the bag from the table and measure the difference in height. Do several trials and record the data and the averages (means) on your copy of the bungy trials table.





Bungy Trials				
Weight (number of marbles)	Stretch (difference in height)			
	Trial 1	Trial 2	Trial 3	Average
2				

   b. Graph your averages in a scatter plot.

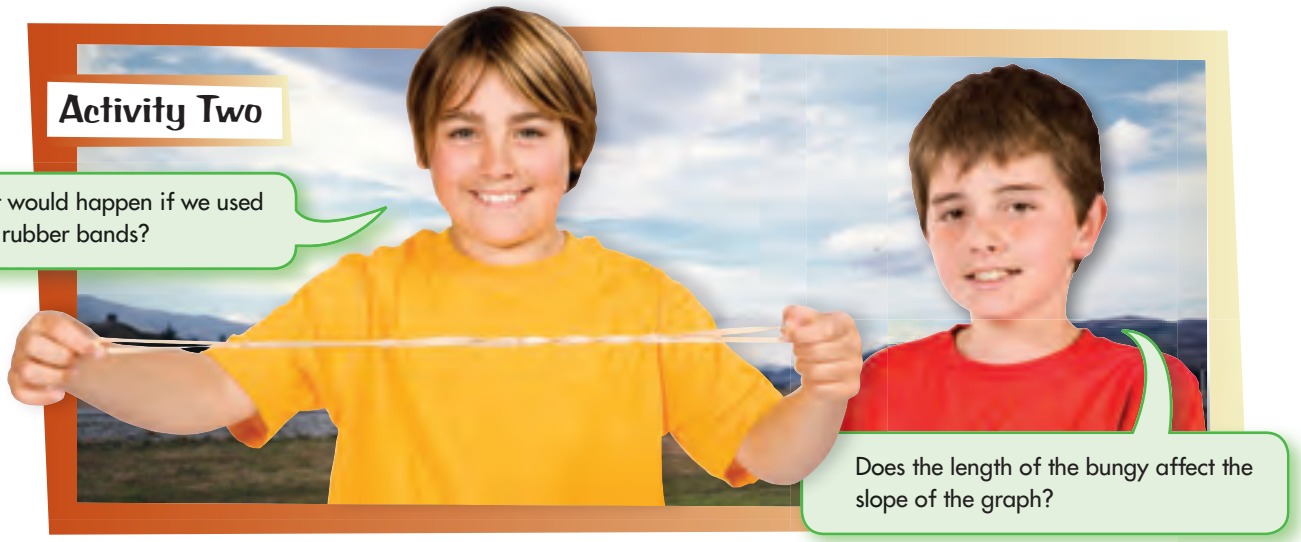
2. a. What does your graph tell you about the relationship between mass and stretch?

   b. i. Predict how far your bungy will stretch if you fill the bag with marbles.

   ii. Test your prediction.

When you jump, your potential (stored) energy changes to kinetic energy and then to elastic potential energy in the stretched bungy cord.

Activity Two

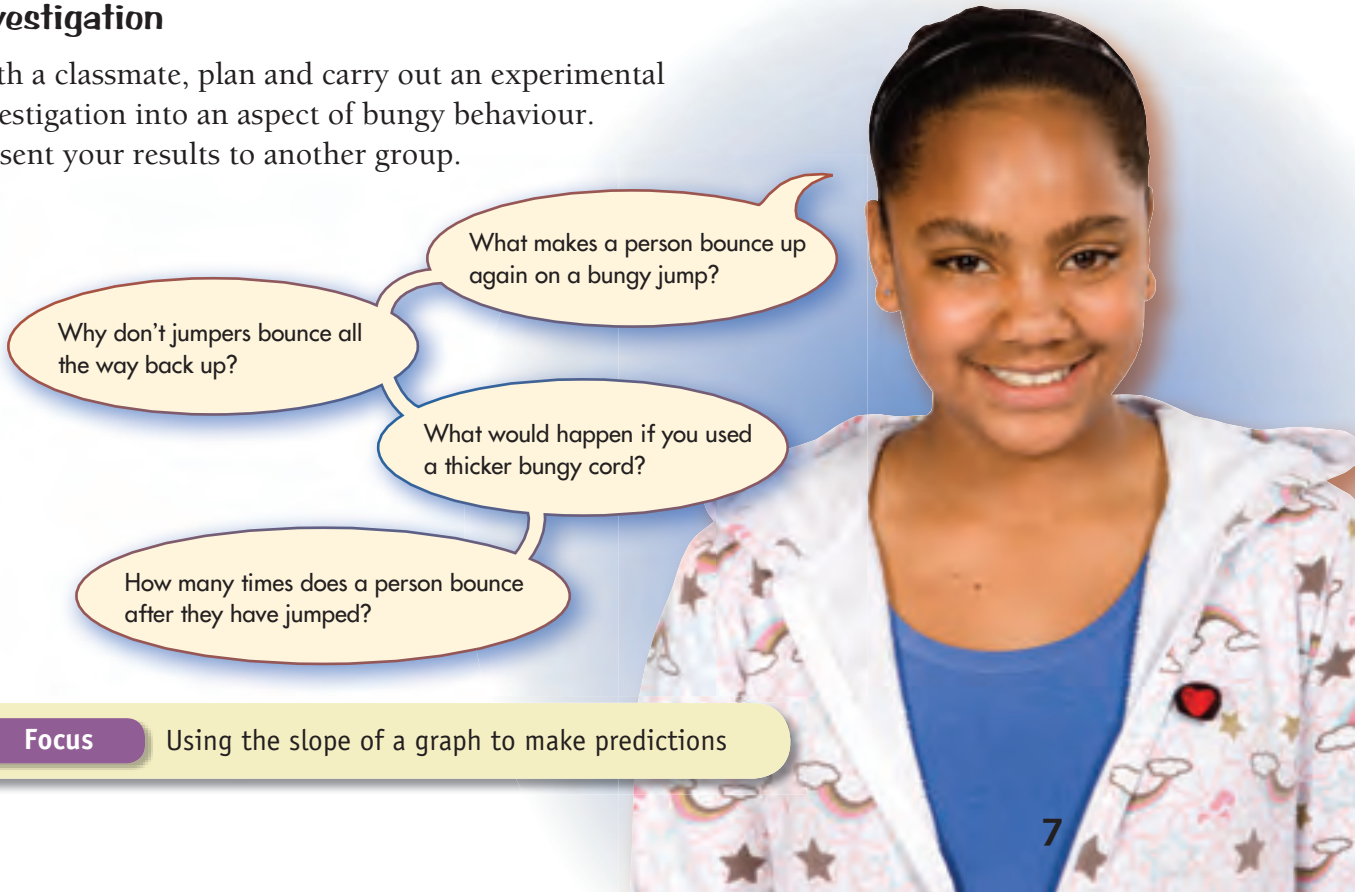


1. a. Add more rubber bands to your bungy and repeat the experiment in **Activity One**.
   b. How does your new graph compare with the original?
   c. Use your graphs to help you predict the stretch for a bungy with 30 rubber bands.

2. David found a magazine article describing a test in which a bungy jump operator tested a 30 metre (m) bungy cord with a 70 kilogram (kg) weight. The cord stretched 9 m.
   a. If a 100 kg person jumped using the 30 m cord, how far do you think they would fall?
   b. The river in the article is 40 m below the bridge. Bungy jumpers want to get close to the river but without getting soaked.
      i. About how long a cord would be needed for a 35 kg person?
      ii. About how long a cord would be needed for a 105 kg person?
      iii. David calculates that the 30 m bungy cord would stretch 36 m for a 200 kg person, so the cord should be shortened to 18 m. What's wrong with David's conclusion?

Investigation

With a classmate, plan and carry out an experimental investigation into an aspect of bungy behaviour.
Present your results to another group.



Focus Using the slope of a graph to make predictions