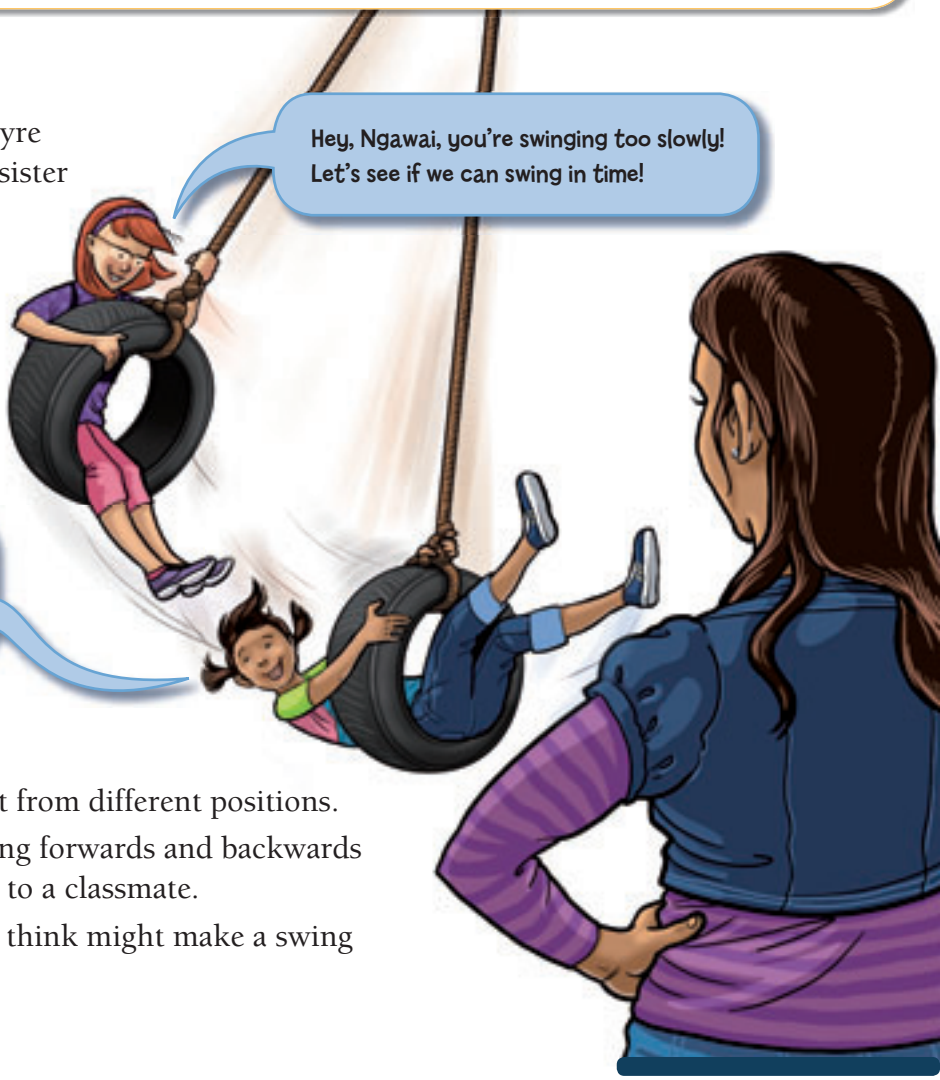
Swing Time

You need
- recording tables (see copymaster)
- a computer spreadsheet/graphing program
- a sealable bag, string, weights such as coins or metal washers, and sticky tape (to make some swing models)
- a stopwatch
- a classmate

Activity One

Lucy and Ngawai are playing on the tyre swings at lunchtime. Ngawai's older sister Tamara is keeping an eye on them.

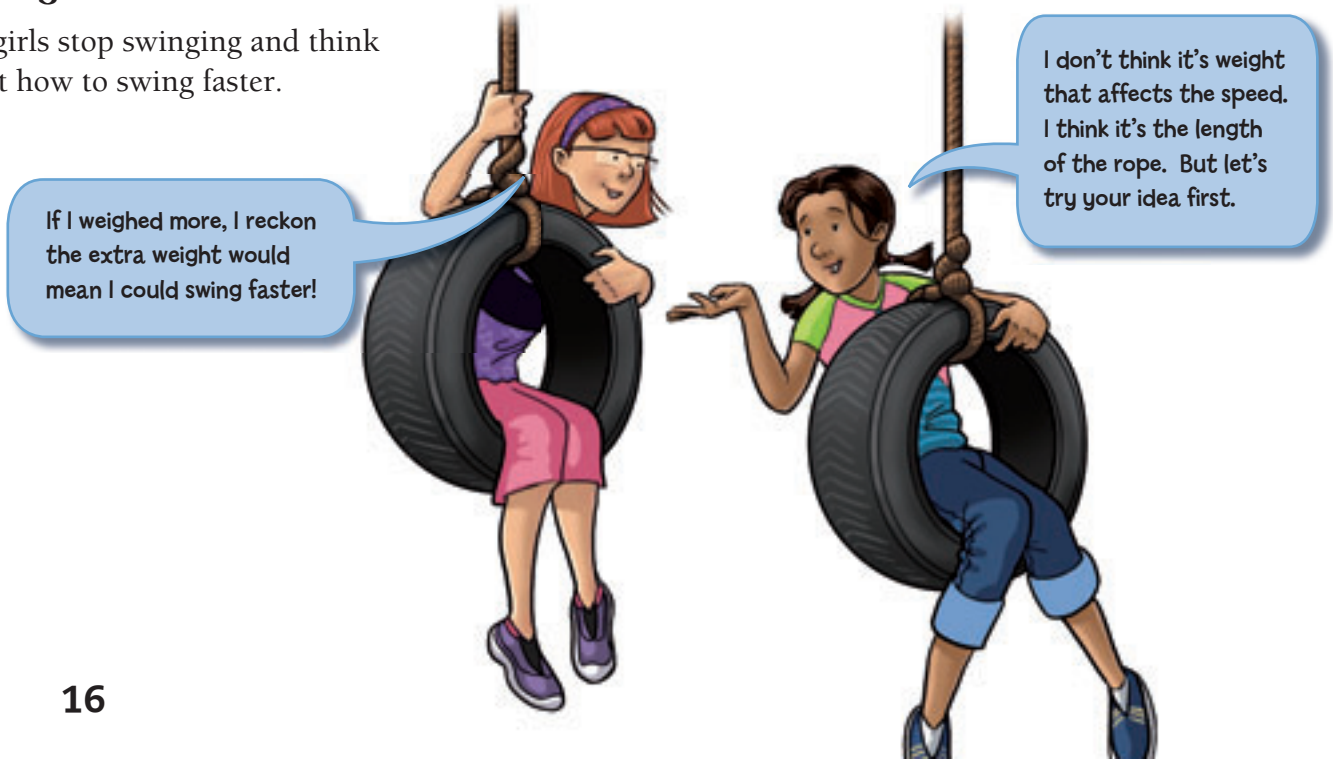
Lucy is on a shorter swing than Ngawai.



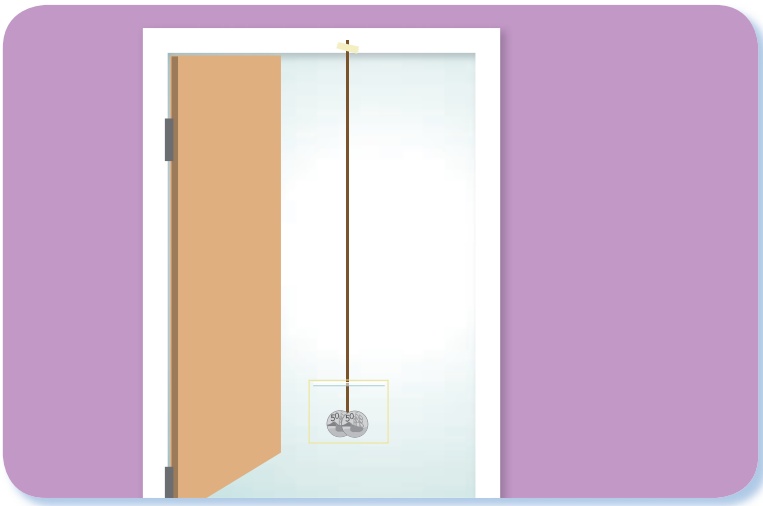
1. Lucy and Ngawai start again but from different positions. Do you think they will now swing forwards and backwards in time? Explain your thinking to a classmate.
2. Together, write down what you think might make a swing move faster or slower.

Activity Two

The girls stop swinging and think about how to swing faster.



1. a. With a classmate, use a model to investigate what happens when you add weight to a swing. You'll need to use enough weight to keep the swing moving forwards and backwards 5 times. Record the time for 5 swings. Do this 3 times for each different weight that you try.



b. Why might it be a good idea to try each different number of weights several times?

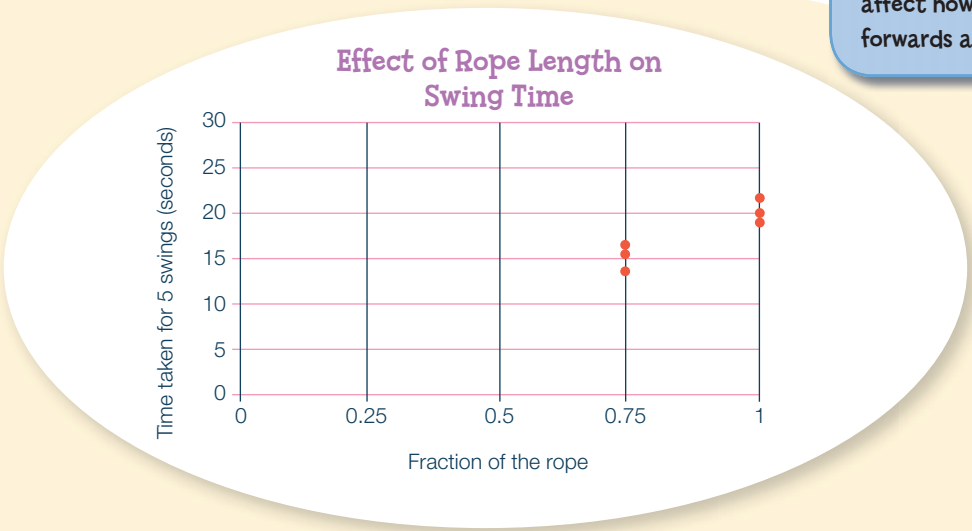
Number of extra weights	Time taken for 5 swings			
	Trial 1	Trial 2	Trial 3	Average

the total time taken divided by the number of trials

2. a. Enter the average for each set of trials into a spreadsheet.
   b. Decide which kind of graph will best display your results. Using the data in your spreadsheet, create the graph.
3. What does your graph tell you about the effect of weight on swing time?

Activity Three

1. Ngawai and Lucy investigated how rope length affects swing speed.



a. Using your model, time 5 swings with the string at full length. (Do some extra trials to investigate Ngawai's comment about the starting point.) Record the results on your copy of the table.

b. Now measure and record the time it takes to do 5 swings with the length at three-quarters, half, and one-quarter.

c. Make a graph of your results. What does your graph tell you?

2. a. Connect the points on your graph. The graph must pass through the origin (0,0). Why?

b. Does your graph look more like a curve or a straight line?

c. Estimate the time taken for 5 swings if the string was twice its full length. Explain your thinking.

Focus Exploring weight and period and identifying trends