

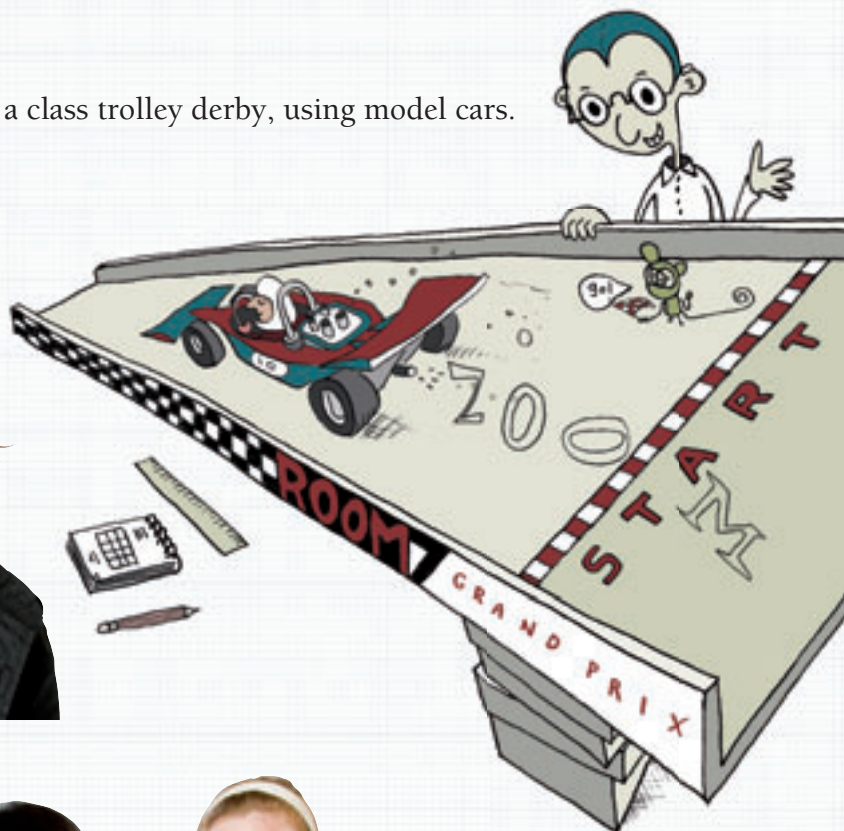
# Zoom, Zoom!

- You need**
- ★ recording tables (see copymaster)
  - ★ a toy car
  - ★ identical blocks of wood or books
  - ★ a plank of smooth wood (1 m long)
  - ★ small weights to place on or in the car
  - ★ a measuring tape or ruler
  - ★ a computer spreadsheet/graphing program (optional)
  - ★ classmates

## Activity One

The students in Room 7 are preparing for a class trolley derby, using model cars.

The car will run down the ramp when we let it go. We can't give it a push!



1. Discuss with a group of classmates what might affect how far a car travels after it leaves the ramp.

There are lots of things we can change!

... or the weight of the car.

We could alter the steepness of the slope ...

I think the shape of the car might make a difference.

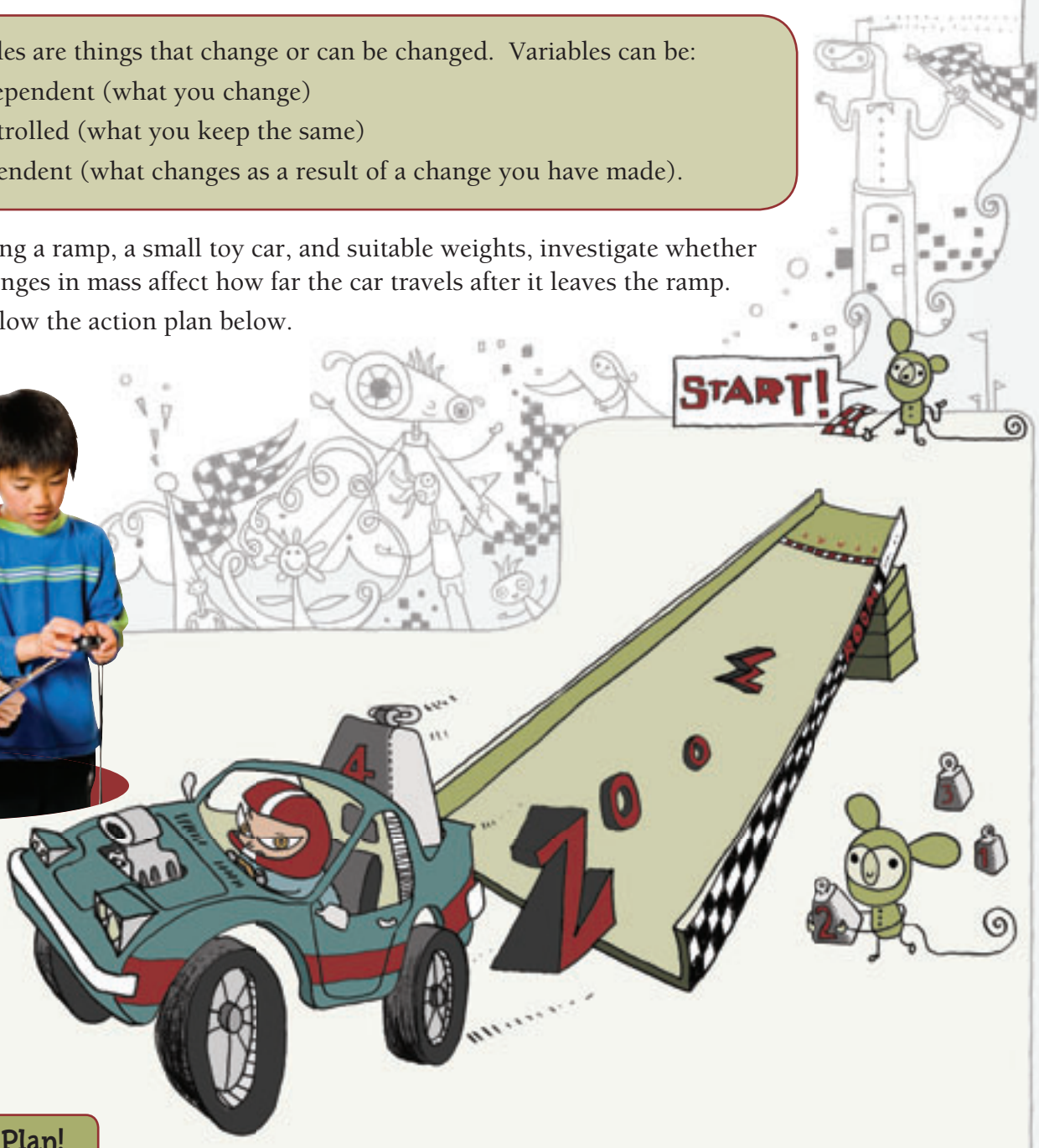


2.

Variables are things that change or can be changed. Variables can be:

- independent (what you change)
- controlled (what you keep the same)
- dependent (what changes as a result of a change you have made).

- a. Using a ramp, a small toy car, and suitable weights, investigate whether changes in mass affect how far the car travels after it leaves the ramp. Follow the action plan below.



**Action Plan!**

- Change the mass.
- Leave other variables the same.
- For each change in mass, carry out 3 trials.
- Start from behind the starting line.
- Measure how far the car travels after it leaves the ramp.
- Record your results on your copy of the table.

Mass	Distance travelled (metres)			
	Trial 1	Trial 2	Trial 3	Average
Car + 0 weights				
Car + 1 weight				

the sum of the 3 trials divided by 3

- b. In this experiment, what are the independent and dependent variables?
- c. Graph the average (mean) distance for each set of trials. Discuss what the graph tells you.

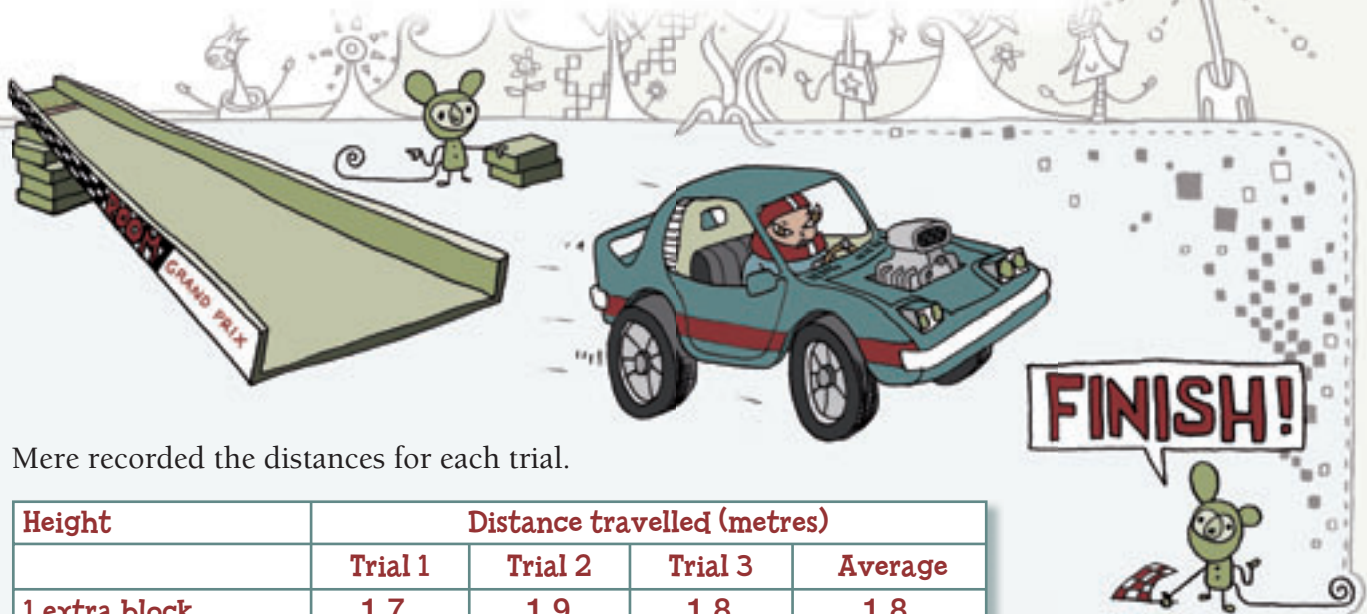
3.

What might your findings tell you about a real car?



## Activity Two

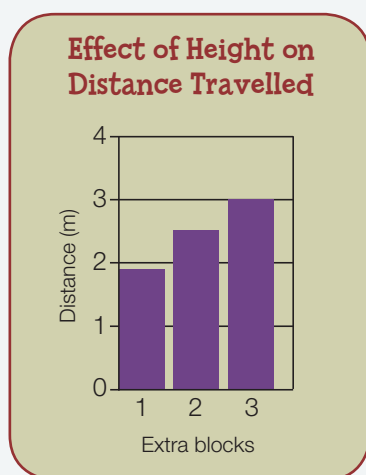
Laura's group decided to investigate height (steepness) as a variable. They used extra blocks of wood to increase the height of the ramp. For each trial, they measured the distance the car travelled from the starting line.



Mere recorded the distances for each trial.

Height	Distance travelled (metres)			
	Trial 1	Trial 2	Trial 3	Average
1 extra block	1.7	1.9	1.8	1.8
2 extra blocks	2.4	2.6	2.5	2.5
3 extra blocks	2.85	2.9	3.1	2.95

The group then graphed the average distance against the height (the independent variable).



1. Repeat the experiment that Laura's group carried out and graph your results.
2. Compare your graph with those of other groups. Discuss reasons for any differences.
3. What conclusions can you reach about the effects of mass and height on the distance a car travels?

### Focus

Measuring variables accurately and exploring data