The Great Race

You need ☑ cardboard ☑ chalk ☑ two classmates
☑ square grid paper or a computer spreadsheet

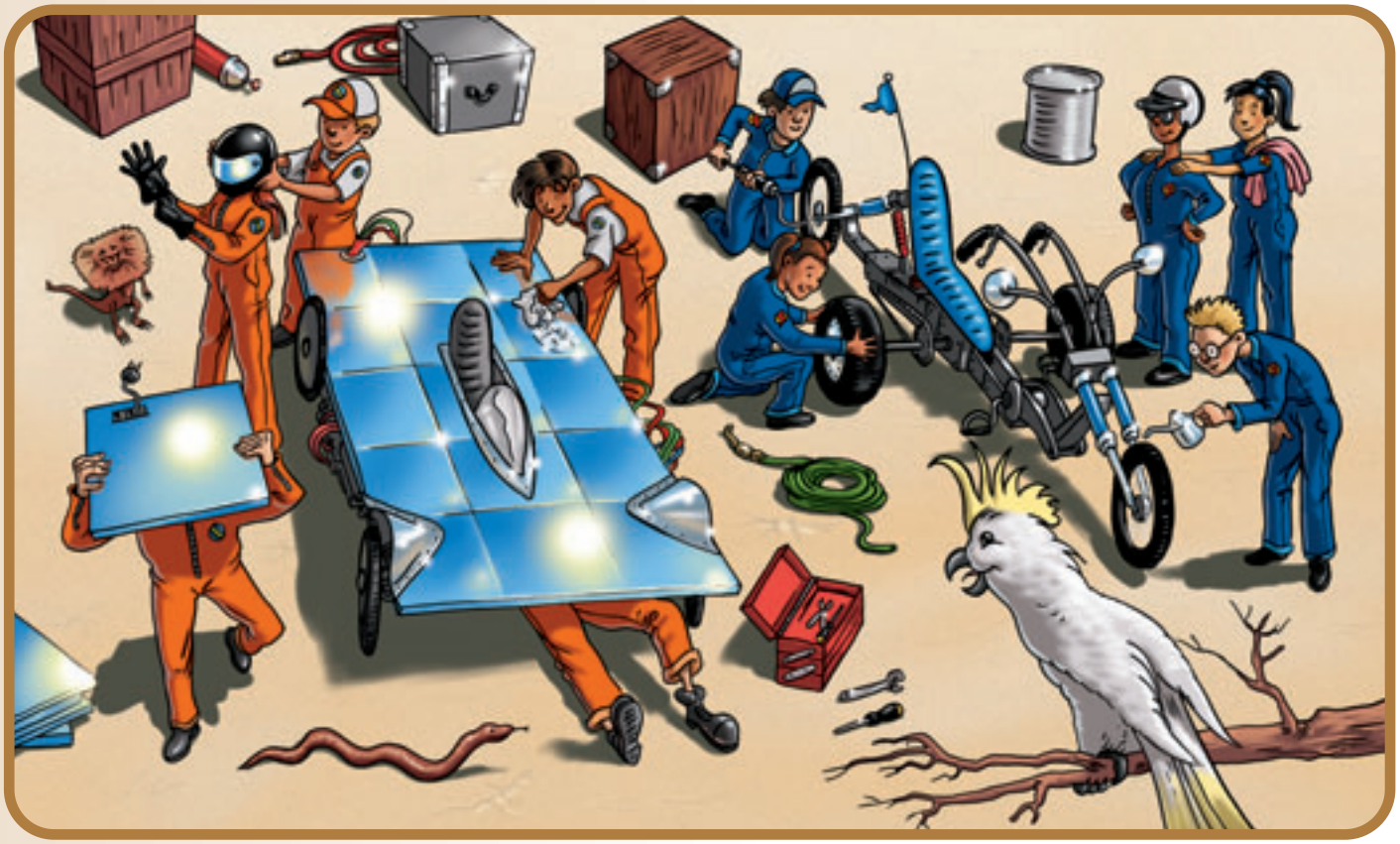
Activity

The 1 000 kilometre Eco-car Race across part of Australia's Nullabor Plain is for cars designed, built, and driven by school students. The race starts at 5.00 a.m. on Saturday.

Two New Zealand cars are entered:

Pedal Power Plus. The crew of this car expect to average 25 kilometres per hour for the first 24 hours (until 5.00 a.m. on Sunday), reducing to 20 kilometres per hour for the rest of the race. They will take a break each day from 11.00 a.m. to 3.00 p.m., for rest and maintenance.

Sunlight Sprinter. Solar panels on this car convert sunlight into electricity. They work in any weather conditions but only in daylight hours: 6.00 a.m. to 8.00 p.m. The car's cruising speed is 30 kilometres per hour.



1. a. How far will Pedal Power Plus get before Sunlight Sprinter starts?
   b. How far will each car travel before stopping for its first scheduled break?
   c. How far should each car get by midnight on the first day?

2. Cut three strips of cardboard: 20, 25, and 30 centimetres long. These scale strips will represent the distance that the cars travel in 1 hour: 20, 25, and 30 kilometres.

On an asphalt area of the playground, measure out a distance of 10 metres. Use chalk to draw a starting line at one end and a finishing line at the other.

a. Ask two classmates to "crew" the "cars" as you model the race on the asphalt, using the strips of cardboard. Read out each hour (5.00 a.m., 6.00 a.m., 7.00 a.m., and so on) and get your classmates to move their "cars" 1 length (or not at all if it is a rest hour). Mark each new position with chalk.

b. Who wins the race and by how much?

3. Using square grid paper or a computer spreadsheet, graph the progress of the two cars.
How can you see which car wins?

I'm using my square grid paper on its side …

Time goes across the bottom:
1 square for 2 hours.
Distance goes up the side:
2 squares for 100 kilometres.

4. Make a list of factors that could change the predicted result.