



What you'll need

Special materials

You can do this activity with all sorts of things you have in the house, but we've found the plastic milk bottle lids Mark uses in the video are excellent for wheels because they're easy to pierce with a kebab skewer and don't need anything else to keep them stuck on.

- A balloon
- Some scrap cardboard (for example from an old cereal box or other packaging)
- Wooden kebab skewers
- At least one bendy drinking straw
- 2 other straws (must be wide enough for a kebab skewer to fit inside)
- Sellotape or other sticky tape
- At least 4 plastic milk bottle lids
- Blu-tac or similar substance
- Scissors

What to do

Being safe

The kebab skewers are sharp and care must be taken when piercing anything with them. Always make sure you point the skewers away from yourself and away from others. Take care when using scissors too.

Make a balloon car based on the instructions Mark gives in the video.

Decide how you will judge what makes a 'good' car – is it how far it goes or how fast it goes?

Investigate what happens if you have bigger or smaller wheels (you can use other types of lids or make wheels from cardboard and use blu-tac or glue to attach them to the kebab skewers).

Investigate what happens if you change the design of your car in other ways - you can watch the video again for inspiration for other designs.



Questions to ask children

Why does the car go forward if the balloon is blowing backwards?

Do you think the size of the wheels will affect how fast it goes?

Do you think the size of the wheels will affect how far it goes?

What can we change about the design to make a better car?

What do we mean by a 'better' car?

How can we measure how far the car goes?

How can we find out how fast the car goes?

The science

Going further

You can find the speed of your car in metres per second using a stopclock and a tape measure: Measure the distance the car travels (in metres) then dividing that distance by the time it took to travel (in seconds).

Learn more about Newton's Third Law here: <http://bit.ly/Newton3>

As Mark explains in the video: the air coming backwards out of the balloon is what pushes the car forward, just as the hot gases coming out of the bottom of a rocket push it upwards.

Lots of things work like this. For example, when a bird flaps its wings, it presses down-wards on the air, this makes the bird go upwards.

You can't fly because your arms aren't like wings and you are too heavy. But you may be able to swim. If you do the breast stroke, your arms push the water backwards and that's what makes you move forwards.

With a balloon racer, the balloon pushes air out backwards and the car and the balloon get pushed forwards.

This is an example of a general physics principle known as Newton's Third Law which says that if one object exerts a force on a second object, then the second object exerts the same size, and kind, of force on the first object, but in the opposite direction.

