

INVESTIGATING AND EXPLORING JOURNEYS

Wind-up car



About this activity

This activity is taken from Robert Winston's new book, *Science Lab*, and during it you will learn how to use energy to move a vehicle by building a wind-up car. You'll discover that energy cannot be created or destroyed, it can only be transferred.

Time

30 minutes

Kit list

- ✓ 15 x 8cm rectangle of cardboard
- ✓ 2 x 11cm of garden stick
- ✓ A4 piece of paper (cut into two 3cm x 29.7cm strips and a 15cm x 29.7cm strip)
- ✓ Double-sided tape
- ✓ Four plastic bottle tops
- ✓ Pencil
- ✓ Glue
- ✓ Adhesive putty to protect your fingers (optional)
- ✓ Ruler (optional)
- ✓ Safety scissors

Watch out!

- ✓ Be careful when using scissors
- ✓ Use adhesive putty to protect the table and your fingers when making holes in the bottle tops
- ✓ If you decorate your car, make sure to put down newspaper when painting
- ✓ If you are making the hole by pushing a pointed object through the lid, you should NEVER point the object towards any part of your body. Put the lid on a hard surface and press down with pointed object

Instructions:

Make the chassis:

- 1 Do some research on key 'car' terms. E.g. 'chassis', 'axle' and 'bearing'.
- 2 On the rectangle, draw two dots at one end, 2cm in from the end and sides. Join the dots with a line.
- 3 Draw two 5cm lines from each dot at right angles from the first line. Cut along the lines to create a flap.
- 4 At the other end, draw two lines, 1 and 7cm from the short edge.
- 5 Along the 1 cm line mark two dots 2cm in from each of the long edges
- 6 Connect the dots to the ends of the 7cm line with a curved line. Cut along the curve and discard the pieces.

The bearings:

- 7 Roll the 15cm x 29.7cm strip of paper lengthways to make a tube. Seal the tube with tape.
- 8 Cut into two 1cm pieces and one 4cm piece. These are your bearings.

The spring:

- 9 Stick the two long strips of paper together using tape to make one 3cm x 29.7cm piece.

- 10 Tape one end of the long paper strip to the middle of one piece of garden stick. Coil the paper tightly around it (but don't secure it with tape).

Assembling the car:

- 11 Lift the flap in the chassis. Place the spring over the hole. Turn the chassis upside down and pull the spring through, then fix the end of the spring to the chassis.
- 12 Turn the chassis over. Place a 1cm bearing over each end of the axle so there is one on each side of the flap.
- 13 Put the other garden stick into the 4cm bearing. Glue the bearing to the front of the chassis. Leave it to dry.
- 14 Carefully make the wheels: insert a small hole in each of the bottle tops and put them onto the ends of the garden sticks.
- 15 Wind up the spring by pulling the car backwards and then let go!

Next steps:

- ✓ Enjoy more fun and educational experiments with DK's books and downloadable activity sheets. Please visit dk.com/britishscienceweek

