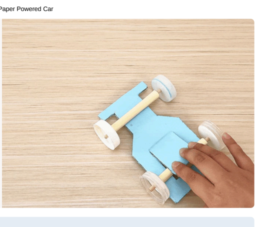
Paper Powered Car

Stem Activities

Ages: 9-12

Less than 30 minutes

Grownup needed



Would you believe that thin, soft ordinary paper can power your small car? While it might sound unbelievable, it's actually science! Are you ready? Let's make your car zoom forward using paper!

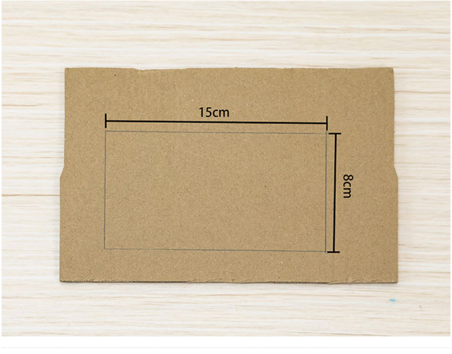
Materials Needed

Cardboard
card paper
4 bottle caps
paint
paint palette
double-sided tape
scissors
pencil
paintbrush
wooden sticks
plasticine
ruler

Step-by-step tutorial

Step 1

Draw a 15cm x 8cm rectangle on the cardboard.



Step 2

Carefully cut out the rectangle you've drawn using scissors.

Step 3

On the right wide edge of the rectangle, mark 2cm vertically and draw a line parallel to the wide edge. At both ends of this line, make marking points 2cm perpendicular to the long edge.

Step 4

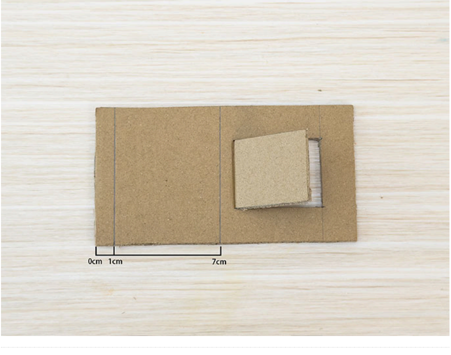
Next, draw a 5cm line from each marking point.

Step 5

Using scissors, cut the 4cm line between the marking points, then carefully cut along the two 5cm lines to create a flap.

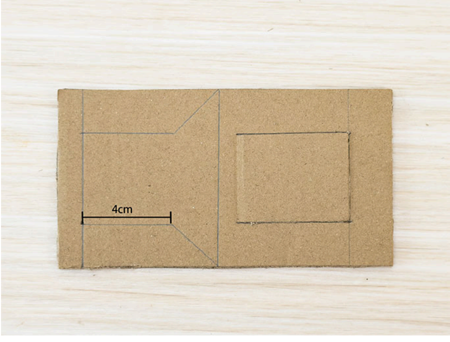
Step 6

As shown in the diagram, make marking points at 1cm and 7cm along the long edge, and draw vertical lines at these points.



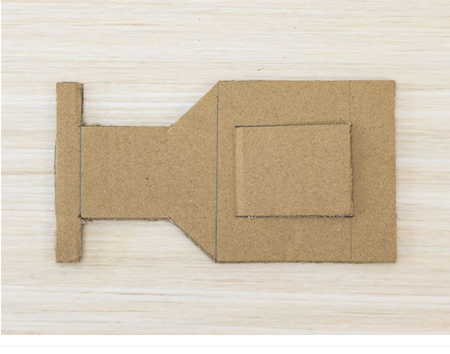
Step 7

At both ends of the line closest to the end, mark 2cm points and draw 4cm vertical lines from each point. Then connect the endpoints as shown in the diagram.



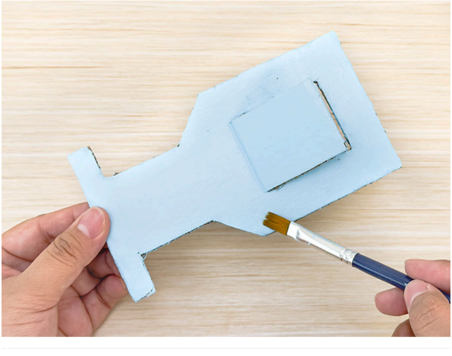
Step 8

Cut along the lines you've just drawn with scissors, and you've completed the initial body of your powered car!



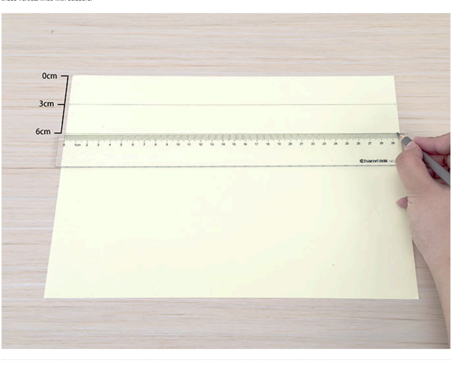
Step 9

Paint your powered car in your favourite colours.



Step 10

Take another piece of paper, mark points at 3cm and 6cm from the wide edge, and draw lines perpendicular to the wide edge at these points. Then cut along these vertical lines with scissors.



Step 11

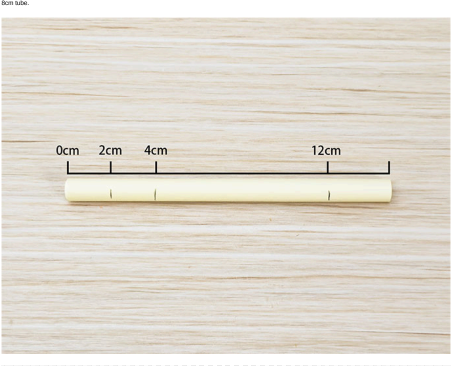
Use double-sided tape to stick the two paper strips together.

Step 12

Take the remaining paper piece after cutting the strips, and use a wooden stick to roll it into a tube, securing the edge with double-sided tape.

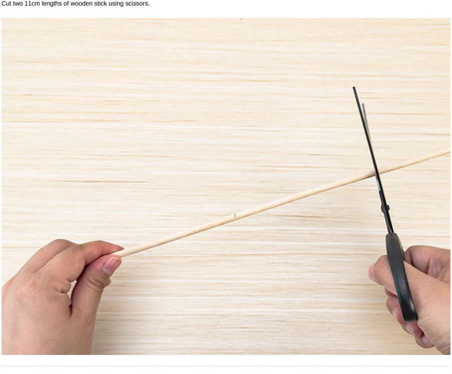
Step 13

Using a pencil, mark points at 2cm, 4cm, and 12cm on the paper tube. Then cut the tube at these marks with scissors - you'll end up with two 2cm tubes and one 8cm tube.



Step 14

Cut two 11cm lengths of wooden stick using scissors.



Step 15

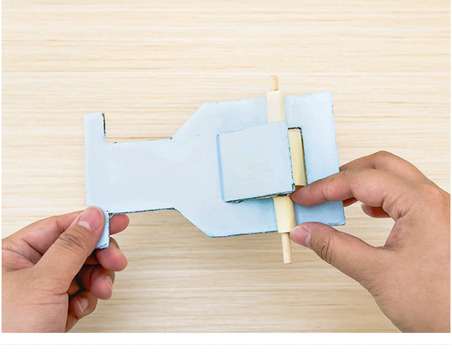
Use double-sided tape to attach one end of the long paper strip to the middle of the wooden stick. Wind the paper strip around the wooden stick.

Step 16

Turn the car body over and position the stick with the paper strip as shown. Secure the end of the paper strip to the back of the car using double-sided tape.

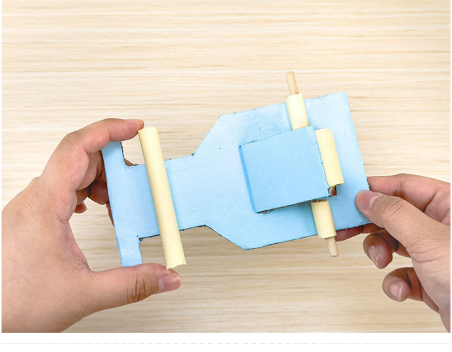
Step 17

Turn the body over again, slide the two 2cm short paper tubes onto the ends of the wooden stick. Then glue them to either side of the rectangular hole.



Step 18

Attach the remaining 8cm paper tube to the car body as shown, parallel to the tubes attached in the previous step.



Step 19

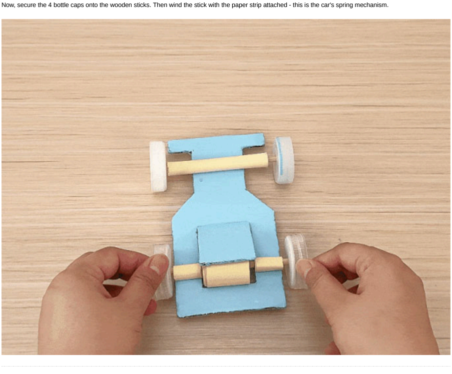
Insert plasticine into the bottle caps.

Step 20

Using a pencil, make a hole in the centre of each bottle cap with plasticine. Make all 4 bottle caps this way.

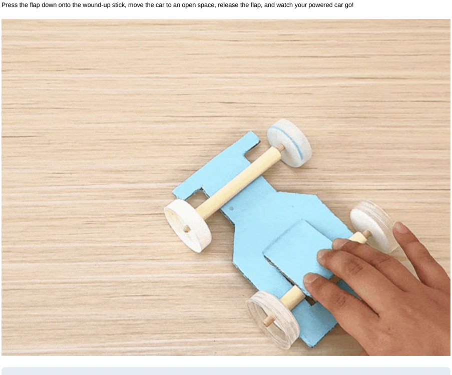
Step 21

Now, secure the 4 bottle caps onto the wooden sticks. Then wind the stick with the paper strip attached - this is the car's spring mechanism.



Step 22

Press the flap down onto the wound-up stick, move the car to an open space, release the flap, and watch your powered car go!



The Science Behind It:

The paper-powered car works on the principle of elastic potential energy and kinetic energy. When you wind up the paper, it stores energy - this is elastic potential energy. As the flap is released, this stored energy converts into kinetic energy, propelling the car forward.