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Tea Box Bot

Maker Pack: Skill Level ● ● ● ● ○

Upcycle a small box to make a mechanical robot!

Explore mechanisms like cams, levers and wheels and axles.

See how to make with TechCard on our website.



Assembly videos on YouTube!

Parts to make 1 model

Structural Parts

TechCard Strip	2
TechCard Girder	2

Mechanical Parts

25mm Disc	3
40mm Wheel	2
60mm Wheel	2
300mm Dowel Axle	2

Additional Materials

Upcycled box about 140mm x 75mm x 75mm.
250mm Thin String
Thin card, paints, pipe cleaners, lolly sticks, upcycled bottle tops and packaging.

You will have parts left over towards other models.

Parts to make 10 models

Structural Parts

TechCard Girder	20
TechCard Beam	20

Mechanical Parts

25mm Disc	30
40mm Wheel	20
60mm Wheel	20
300mm Dowel Axle	15

Additional Materials

10 x Upcycled boxes about 140mm x 75mm x 75mm.
2.5M Thin String
Thin card, paints, pipe cleaners, lolly sticks, upcycled bottle tops and packaging.

Based on pupils sharing off-cuts between them.

Make the Tea Box Bot

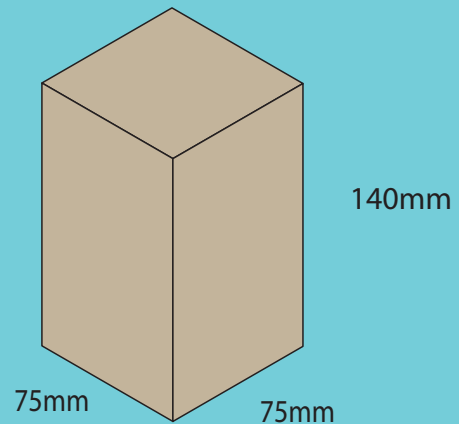


Before you start see
'Make with TechCard'
on our website.

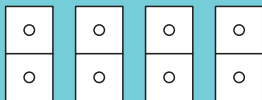
1 Choose a box.

We used a standard
vertical tea box.

Similar boxes will
work for the model.

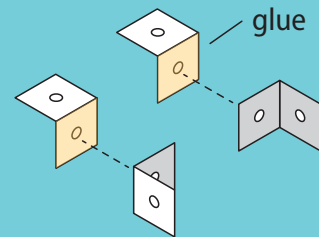


2 Make the brackets.



Cut four 25mm
girders.

Fold and glue the
girders as shown.

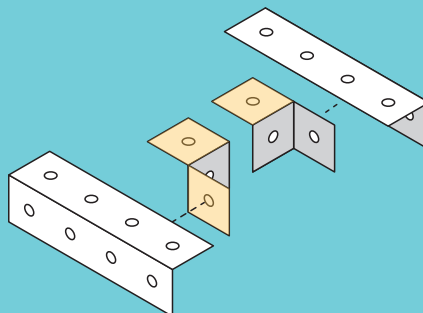


3 Make the chassis.



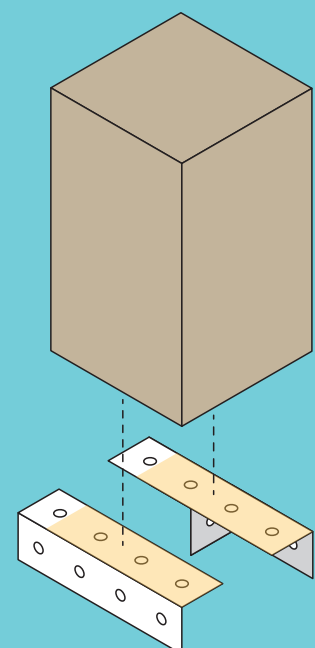
Cut two 100mm
girders.

Fold the girders.



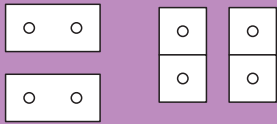
Glue a bracket into the middle
of each 100mm girder.

The girders should be
about 25mm longer than
the depth of the box.

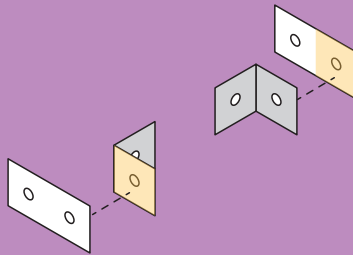


Glue the girders under
the box as shown.

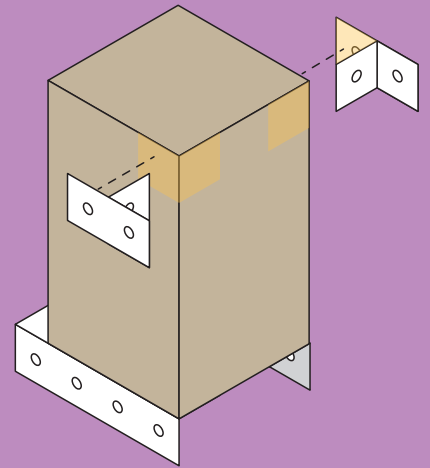
4 Fit the supports.



Cut two 50mm strips
and two 25mm girders.



Fold the girders and glue
to the strips as shown.

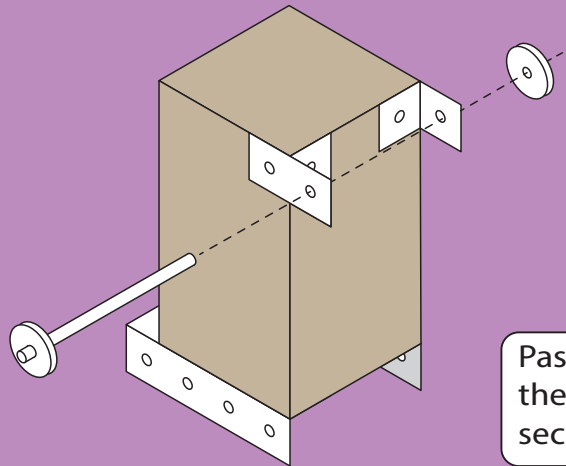


Glue the supports onto
the box where shown.

5 Fit the top axle.



Cut a 125mm axle.



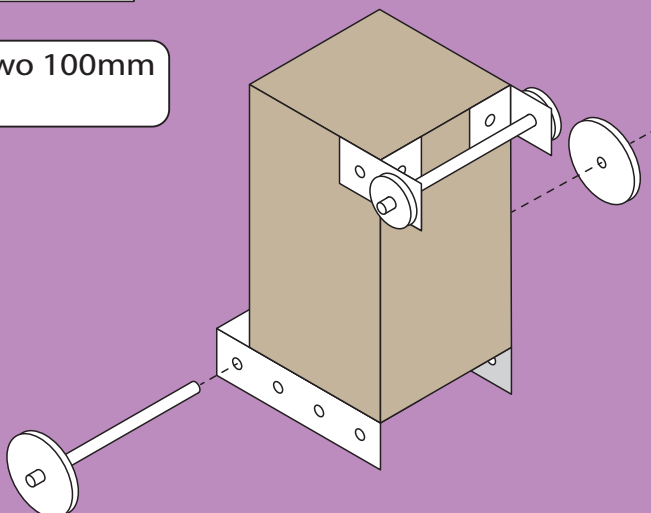
Fit a 25mm disc onto
the end of the axle.

Pass the axle through
the supports and fit a
second 25mm disc.

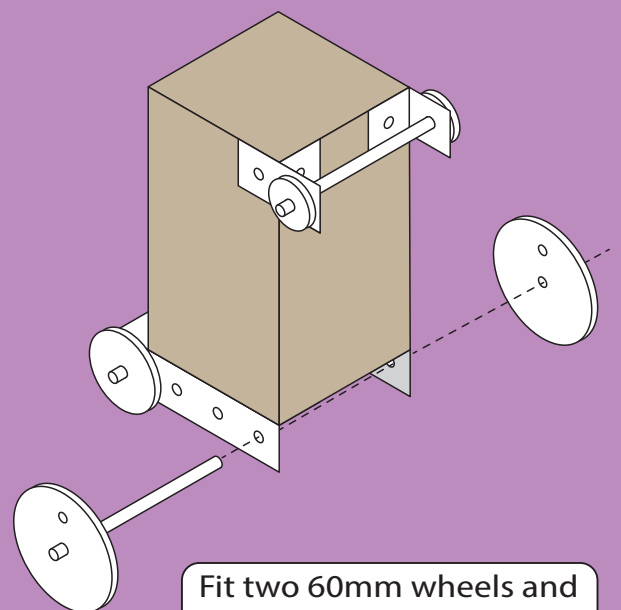
6 Fit the wheels and axles.



Cut two 100mm
axles.



Fit a 40mm wheel to an axle. Pass the axle through
the rear of the chassis and fit a second 40mm wheel.



Fit two 60mm wheels and
axle to the front of the
chassis in the same way.

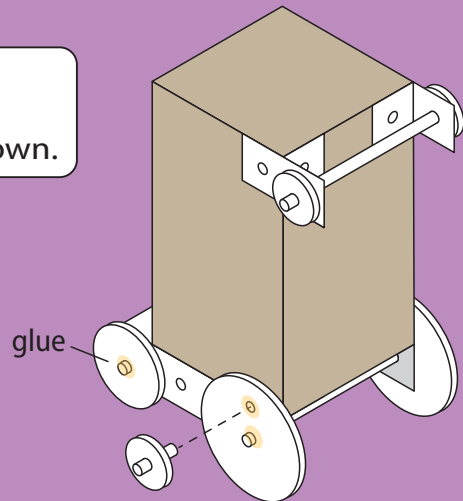
7 Fit the front cam.

Cut a 25mm axle.



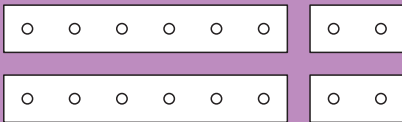
Fit a 25mm disc onto the axle.

Glue the end of the 25mm axle into the 60mm wheel as shown.

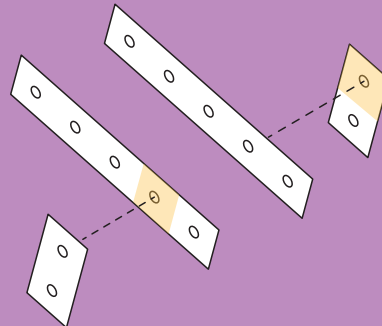


Check the end of the axle only sticks out a little through the 60mm wheel. Check all the wheels are straight and glue to the axles.

8 Make the arms.



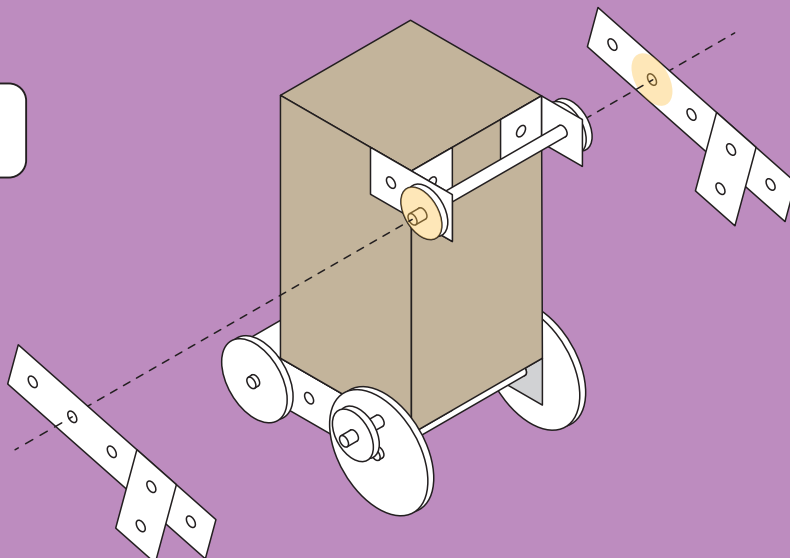
Cut two 150mm and two 50mm strips.



Glue the strips together as shown to make two arms.

9 Fit the arms.

Glue the arms onto the 25mm discs as shown.

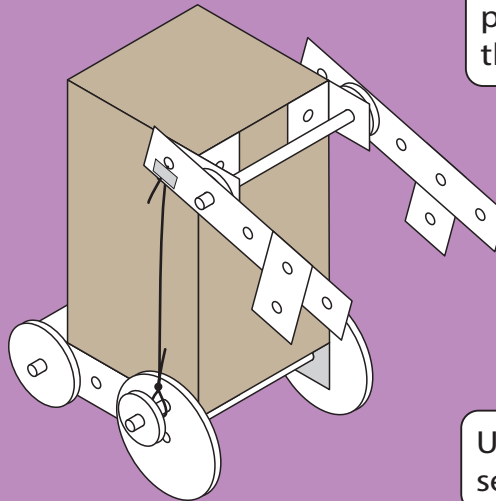


10 Attach the string.

Tie a loop in one end of a 250mm piece of string.

Pass the loop over the 25mm disc and onto the axle.

Position the wheel so the 25mm disc is at the top.

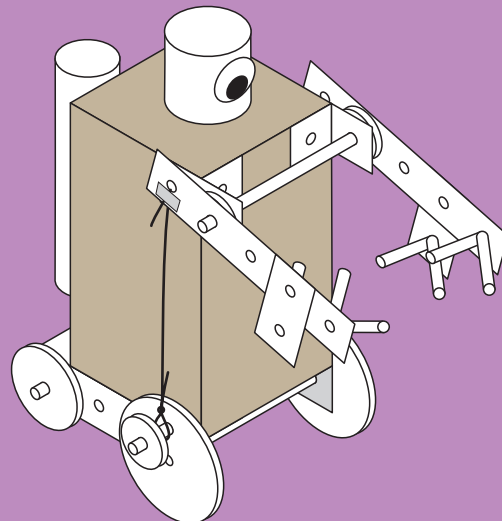


With the arms downward, pass the string through the top hole in the arm.

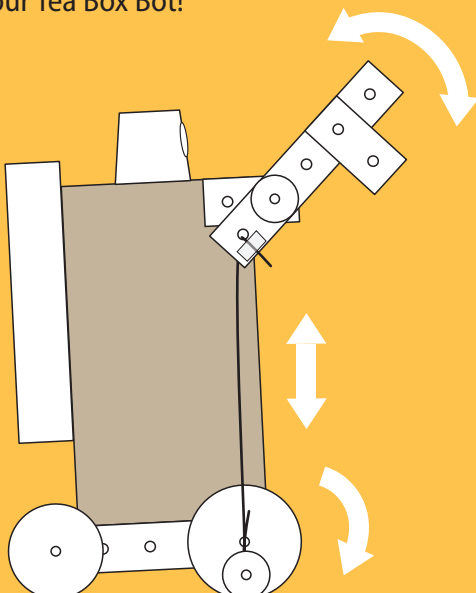
Use a piece of tape to secure the string as shown.

11 Finish your model.

Decorate your robot with plastic bottle tops, straws and other upcycled materials to make it your own.



12 Operate your Tea Box Bot!



As the model rolls forward the cam rotates pulling the string.

The cam transforms the rotating force into an up and down force.

The arms are levers with the fulcrum at the pivot point.

Because of the fulcrum position, the ends of the arms move further than they are pulled by the string.