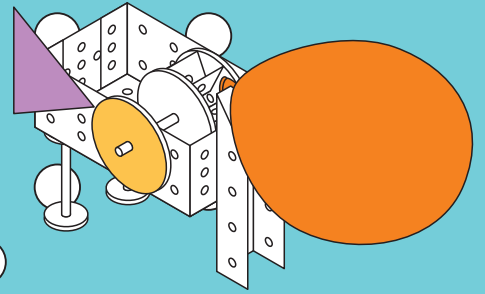




Visit TechCard at [techcard.co.uk](http://techcard.co.uk) & Instagram & YouTube

# Air Turbine

Power-it Kit Skill Level



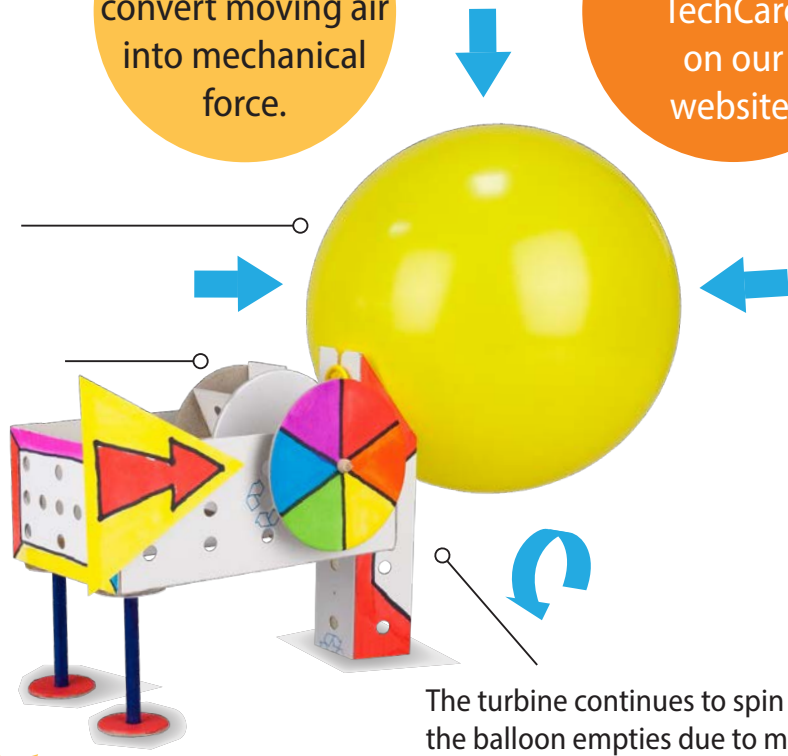
Build an air powered turbine & learn how air can make things move!

Explore how turbines can convert moving air into mechanical force.

See how to make with TechCard on our website.

The balloon is a battery of stored energy.

Escaping air generates thrust which causes the turbine to spin.



The turbine continues to spin after the balloon empties due to momentum.



Assembly videos on YouTube!

## Parts to make 1 model

Structural Parts		Mechanical Parts	
TechCard Girder	1	25mm Disc	6
TechCard Beam	1	60mm Wheel	4
TechCard Project Base	1	300mm Dowel Axle	1

### Additional Materials

Balloon x 1  
A5 Size Thin Card

You will have parts left over towards other models.

## Parts to make 10 models

Structural Parts		Mechanical Parts	
TechCard Girder	5	25mm Disc	60
TechCard Beam	5	60mm Wheel	40
TechCard Project Base	10	300mm Dowel Axle	10

### Additional Materials

Balloon x 10  
A5 Size Thin Card x 10

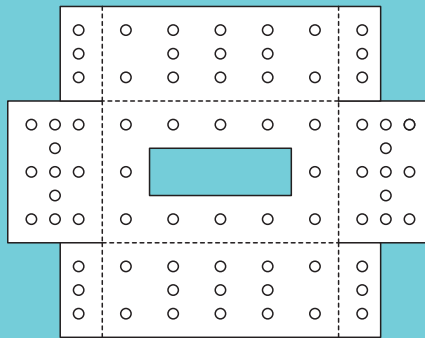
Based on pupils sharing off-cuts between them.

# Make the Air Turbine

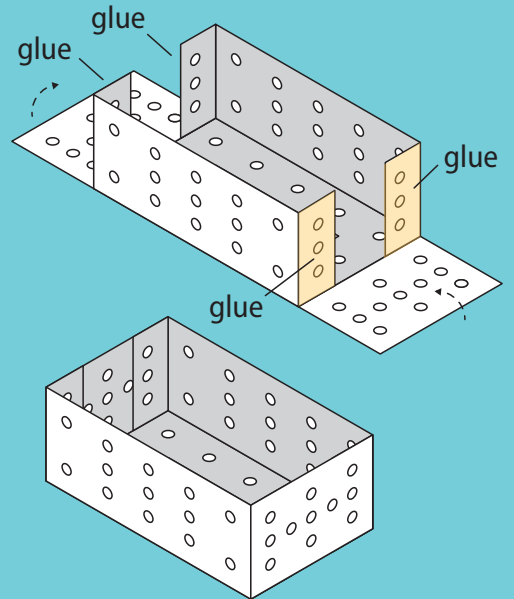


Before you start see  
'Make with TechCard'  
on our website.

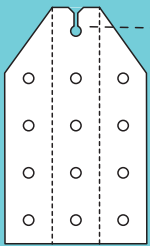
## 1 Make the base.



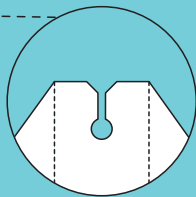
Fold and glue a TechCard  
Project Base.



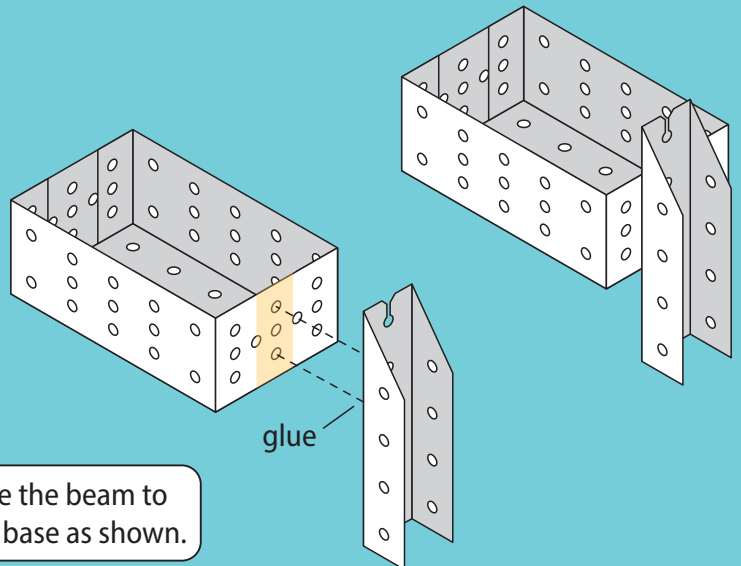
## 2 Fit the balloon support.



Cut a 125mm  
beam to the  
shape shown.



Cut a narrow slot  
to the top hole.



Glue the beam to  
the base as shown.

## 3 Fit the legs.



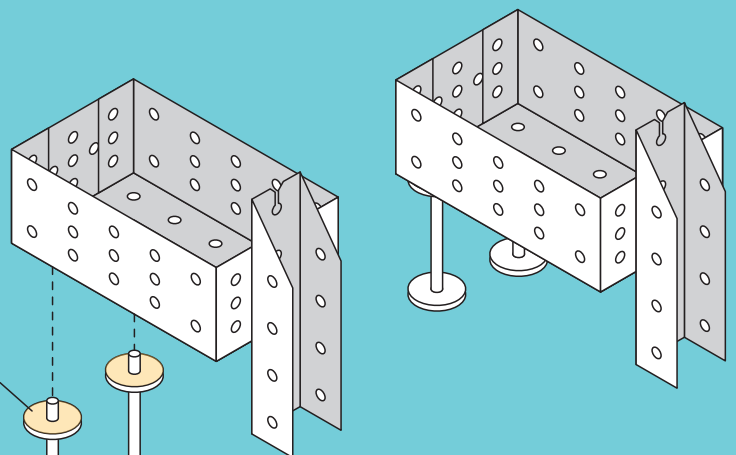
Cut two 60mm axles.



glue

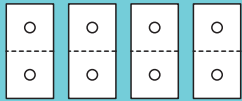
glue

Fit a 25mm disc on the end of each  
axle and glue. Fit a second 25mm disc.



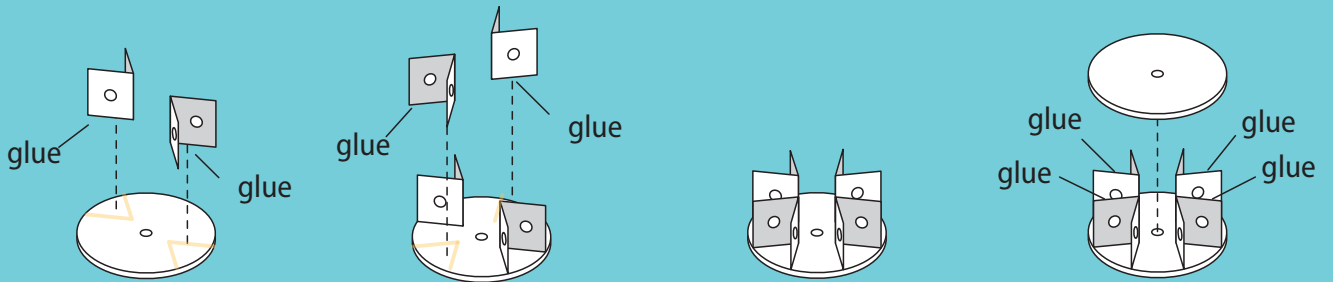
Glue the legs to the underside of the  
base where shown and check it is level.

**4** Make the turbine.



Cut four 25mm girders.

Use the template on the last page of these instructions to help assemble the turbine.



Fold and glue two girders to a 60mm wheel as shown.

Fold and glue two more girders to wheel as shown.

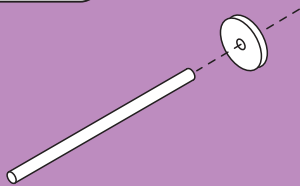
The girders should be opposite each other.

Glue a second 60mm wheel to the top of the girders.

**5** Fit the turbine.



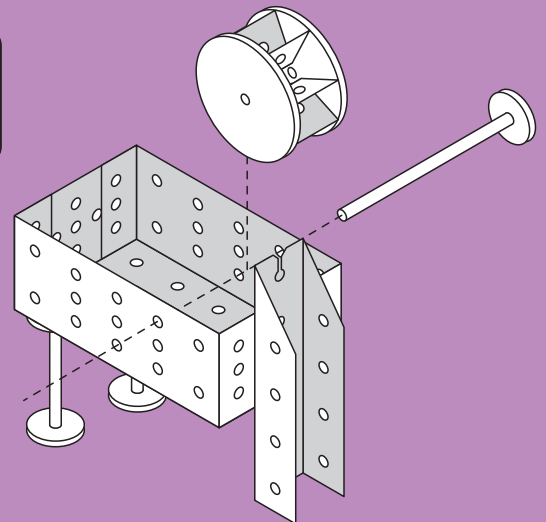
Cut a 110mm axle.



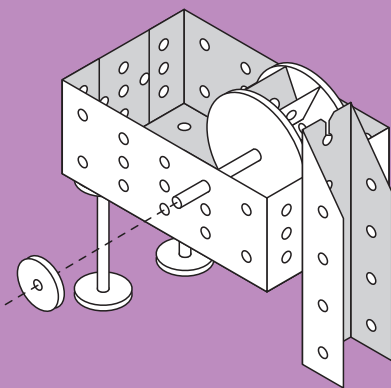
Fit a 25mm disc to the end of the axle.

Pass the axle through the pass where shown.

Pass the axle through the turbine.



**6** Secure the turbine.

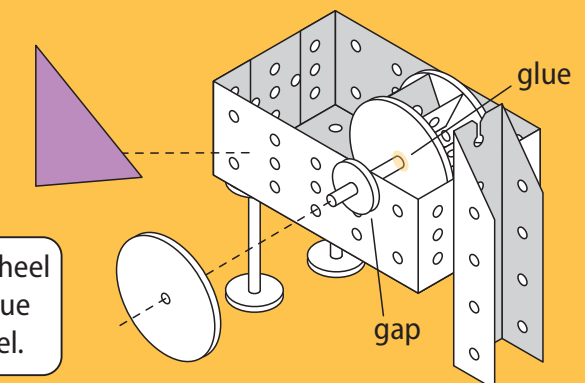


Check the turbine is central. Fit a 25mm disc to the end of the axle.

**7** Finish your model.

Check the turbine is central. Fit a 25mm disc to the end of the axle.

Fit a 60mm wheel to the axle. Glue the body panel.



Check that there are gaps between the 25mm discs and the base. Glue the turbine to the axle.

## 8 Operate your Air Turbine!

Inflate the balloon and the rubber material stretches. The material is 'elastic' and tries to return to its original size. This puts the air inside under pressure.

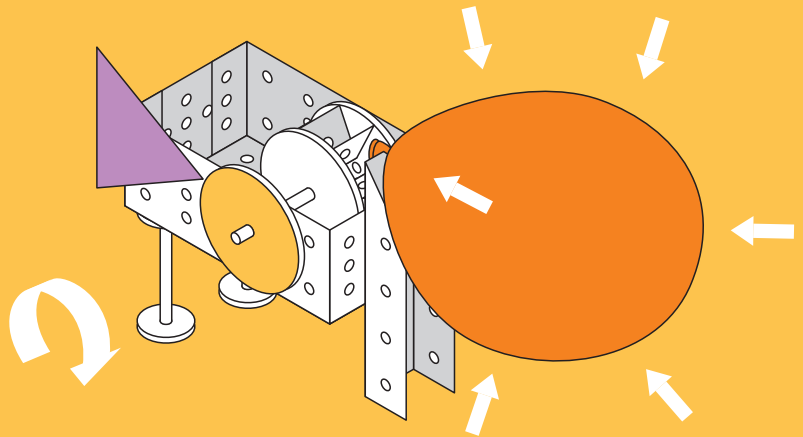
The inflated balloon is like a battery and is full of 'potential energy'.

When the nozzle is released the pressurized air rushes out generating a force called thrust.

The thrust is directed at the turbine which is moved by the force of the passing air.

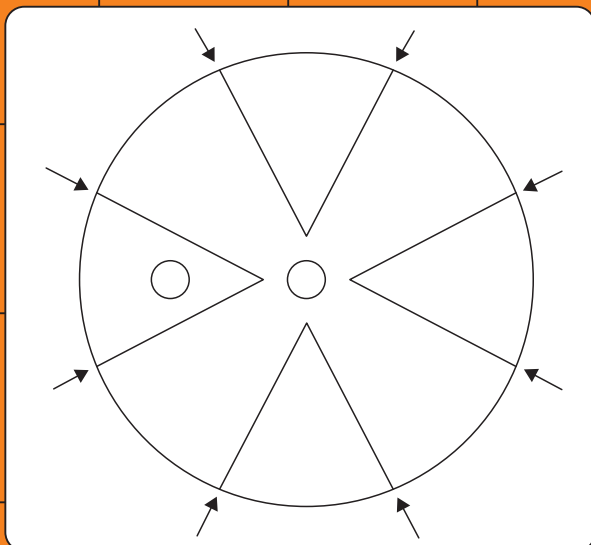
The force of moving air is used to generate electricity using giant air turbines.

Use two hands to pinch and stretch the neck of the balloon and lower it into the slot as shown.



## Card Panel

Print and cut along the solid lines of the panel.



25mm

25mm