

Wind Tunnel

Make something light enough to fly, and put it into the airflow.

5

Makes

28

Materials named

3

Printed step strips

3

Trays cut in advance

What it is

The activity

Children make a lightweight flyer and test it in the tunnel. The example board is headed *Can you make it fly?* and pins up five makes with the built object beside each label.

Nothing is finished until it has been in the airflow.

Theme

- **Flight.** Light enough, and shaped to catch air.
- **Biomimicry.** Nature solved these shapes first, and two of them are on the table as cutouts.

Explore

Aerodynamic animals

Two printed cutouts on the example board: a kingfisher and a bullet train.

The bird's beak enters water without a splash, and the train's nose was shaped to enter air the same way, to stop the bang heard at a tunnel mouth.

Printed A4, colour, one side.

The sycamore seed

The paper helicopter is a samara. It spins as it falls, and the spin slows the fall.

It is the one make here with a nature example a child can hold in the other hand.

YOU CAN SAY

Can you make it fly?

YOU CAN SAY

What in nature already flies like that?

- a seed that spins
- a bird that dives
- a jellyfish that drifts
- a parachute of thistledown

Make

EXAMPLES

Check the example board before the doors open, and rebuild it only if it is damaged. Click the photograph to enlarge it.



Can you make it fly? The five makes, with the built object beside each label.

Paper helicopter template

Handed out at the table, one per child who makes a helicopter

A4, mono, 1 side · [the PDF](#)

Sign

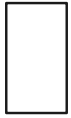
Above the station

A3, colour, 1 side

TECHNIQUES

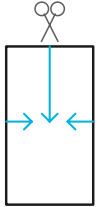
Five makes. A child picks one, and each is its own short build.

Helicopter



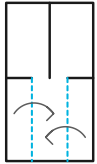
STEP 1

One printed template.



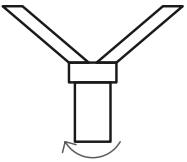
STEP 2

Cut down the middle from the top, and a notch in at each side.



STEP 3

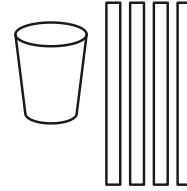
Fold the two side flaps in over the body.



STEP 4

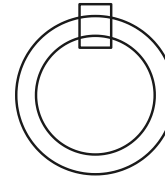
Bend one blade forward and the other back, then drop it.

Hovercraft



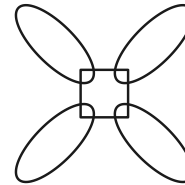
STEP 1

An empty pot and four strips of paper.



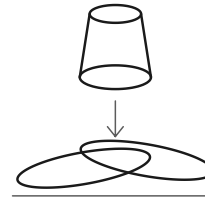
STEP 2

Bend each strip into a loop and tape the ends together.



STEP 3

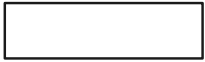
Cross the loops and tape them together at the middle.



STEP 4

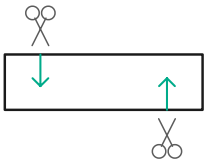
Sit the pot on the loops, open end down.

Ring



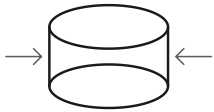
STEP 1

One strip of thick coloured paper.



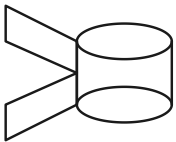
STEP 2

Cut a slot in from the top at one end and from the bottom at the other.



STEP 3

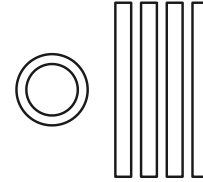
Bring the two ends round and slot them together.



STEP 4

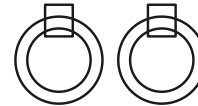
Push the two slots into each other, so the spare ends stand out past the join.

Jellyfish



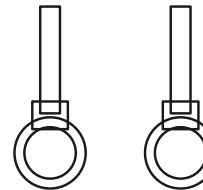
STEP 1

A bottle cap and four strips of cellophane.



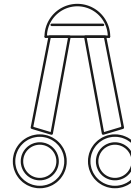
STEP 2

Bend two of the strips into loops and tape the ends together.



STEP 3

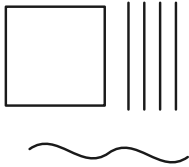
Tape a loop to the end of each of the other two strips.



STEP 4

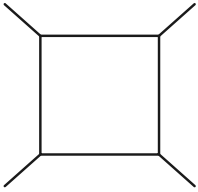
Tape both strips under the bottle cap.

Parachute



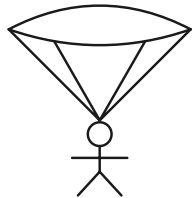
STEP 1

A square of emergency blanket, four lengths of yarn and a pipe cleaner.



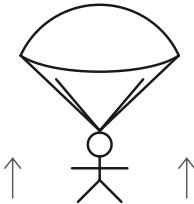
STEP 2

Tape a length of yarn to each corner of the sheet.



STEP 3

Bend the pipe cleaner into a little figure and tie the four ends to it.



STEP 4

Hold it in the airflow. The sheet opens.

Balloons and straws are there for younger children.

STEPS



Look at the board. Five makes, with the built object beside each label.

Pick one and make it, from the trays of cut strips.

Put it in the airflow. That is the test.

Change it and test it again, for as long as they want to.

A flyer is in the tunnel inside ten minutes on any of the five. Step 4 is where an hour goes.

Setup

MATERIALS

To fly

- coloured cellophane
- coloured paper, thick
- coloured paper, thin
- tissue paper
- emergency blankets
- feathers
- paper cups
- light junk

To join

- masking tape
- clear sellotape
- glue sticks
- yarn
- pipe cleaners
- scissors

The tunnel

- display board
- display board holder
- fan repair kit

Adult use

- glue gun
- glue gun sticks
- superglue

For younger children

- balloons
- straws

Print

- paper helicopter template
- example cutouts
- sign

Made in advance

- wind tunnel
- board example
- cut strips

The jellyfish needs a bottle cap, which a child fetches from the shared materials station.

SETUP

Specialist kit

The tunnel, with the mesh attached before the day. The fan repair kit travels with it: dowels, cable ties, a small hook and pliers.

The fan needs a socket. Where the tunnel stands is decided by where the socket is, not the other way round.

Cut in advance

Three trays of strips before the doors open: cellophane, thick paper, thin paper. Refilled from stock through the day.

Printed

The helicopter template, A4 mono, one per child. The sign, A3 colour.

RESET BETWEEN CHILDREN

Offcuts cleared, scissors back in the pot, the trays topped up.

A flyer left in the airflow blocks it for the next child.

Safety

Children handle	Scissors, children's scissors. Pipe cleaners, balloons, straws and paper cups are per child.
Adults handle	Glue guns, adult use only. Superglue, staff use only.
The fan	A factory chrome finger guard is fitted to the fan, and that is what protects fingers. A net sits on top of the guard, below the fan, mostly to stop cellophane and other light material being drawn into the blades. The top is not covered. Supervised at all times. It is mains and needs a socket , so the station has a trailing lead.
The airflow	Nothing is fired into the wind tunnel. Flyers are held in the airflow or let go into it by hand.
First aid	Cuts, from the children's scissors. The first aid pack is at the tool area.

The fan repair kit is not a first aid kit. It holds dowels, cable ties, a small hook and pliers, and it is for the tunnel.

Notes

- The A3 sign has not been made. It prints on Friday.
- Check the example board against the built makes at the venue, and correct any step that does not match.

CORE ACTIVITY

Junk Modelling Vehicles

Vehicles built out of junk, and run. The *roll* half of Nature in Motion.

2 Chassis	3 Drives one not yet working	6 Diagrams	19 Materials named
---------------------	---	----------------------	------------------------------

What it is

The activity

A vehicle built from junk, and made to move. Two chassis and three ways of driving it.

Paired with the [wind tunnel](#) as *fly*. The stock comes from the junk bank beside the table.

Theme

- **Making something move.** An axle that turns freely is the whole difference between a model and a vehicle.
- **Space.** A rover for somewhere with no roads.

Explore

On the table

The example board, headed *Can you make it move?*, with the built vehicles beside it.

A child looks at what is there and takes the drive rather than the design.

What has wheels on it

Bottle caps, tubes, lids. Everything in the junk bank is a possible wheel, body or axle until a child decides otherwise.

Two ideas from nature

- **Grip.** Tread copied from a tree frog's toe pads, and a dry gripper copied from a gecko's foot.
- **Body shape.** A shape can cut drag, which is what the boxfish story is about.

The photographs are in [the biomimicry research](#), filed there under Moon Buggies.

YOU CAN SAY

Can you make it move?

YOU CAN SAY

What is going to push it?

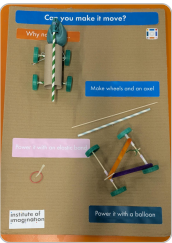
- a balloon

- an elastic band
- a slope

Make

EXAMPLES

The example board asks **Can you make it move?** and answers it in three moves: wheels and an axle, an elastic band, a balloon. Check it before the doors open and rebuild it only if it is damaged. Click the photograph to enlarge it.



Can you make it move? Wheels and an axle, an elastic band, a balloon, with a built car for two of the three.

Box of built models

On the table, laid out in three columns. A child picks one up rather than reading it.

TECHNIQUES

Two chassis and three drives, drawn separately so a child combines them rather than copying a finished car.

Wheels, axle and a body

Wheels and axle

Seen from above. A skewer or a dowel, with a wheel pushed on to each end.

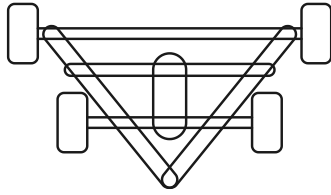
Chassis A, lolly sticks

Two sticks crossed, a straw taped across each end. The axles run in the straws.

Chassis B, a bottle or a jar

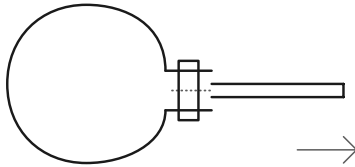
Skewers pushed straight through a bottle. On a jar they are taped along the underside.

Three ways to make it go



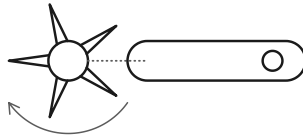
Elastic band

Seen from above. A band round the narrow axle, hooked over a stick laid across the triangle. Winding it stores the turn.



Balloon

The neck stretched over a straw and taped. The air leaves at the far end.



Elastic band fan

The bottle top cut into petals, on a band running the length of the body to a peg at the tail.

The fan drive does not run yet. A child may try it on the day, and it is not expected to go.

STEPS

1

Pick a body from the junk bank. A lolly stick chassis, or a bottle or jar.

2

Get the wheels turning. An axle through a straw taped underneath, caps for wheels.

3

Give it a drive, one of the three: an elastic band, a balloon or a band-driven fan.

4

Run it, and change one thing.

It rolls at step 2, which is about ten minutes. Steps 3 and 4 are where the time goes, and a vehicle that only rolls is still a finished one.

Setup

MATERIALS

Wheels and axles

- bottle caps
- plastic lids
- corrugated card
- wooden skewers
- wooden dowels
- paper straws

Made in advance

- example board

Bodies

- lollipop sticks
- plastic bottles
- small jars
- cardboard tubes

Joining

- masking tape
- scissors

Drives

- elastic bands
- balloons
- string

Adult use

- glue guns
- glue gun sticks
- craft knives

Most of these come from the junk bank.

SETUP

RESET BETWEEN CHILDREN

Offcuts and failed builds back to the junk bank rather than into the bin.

Scissors back in the pot, the ramp clear.

Safety

Children	Scissors, tape, elastic bands, straws, bottle caps, lids and card. Skewers and dowels, which have sharp ends.
Adults	Glue guns. Craft knives, and cutting a bottle open.
First aid	Cleaning wipes and plasters. The risks are cuts, and a wound elastic band letting go.

A wound elastic band stores energy and can flick when it lets go.