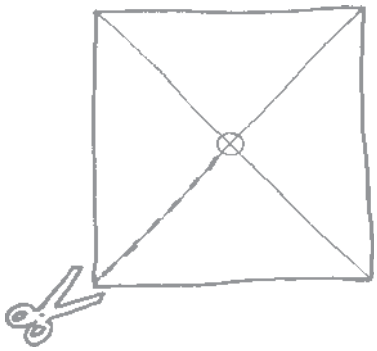
Turbine Windmill Investigation

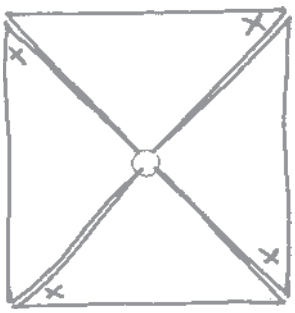
You can build a simple turbine, like the one used in a gas turbine engine using the diagrams below to help you.

1



Using stiff paper, 20x20 cm, draw a cross shown in the diagram. Using scissors, carefully cut from each corner towards the centre, leaving about 1 cm at the centre.

2

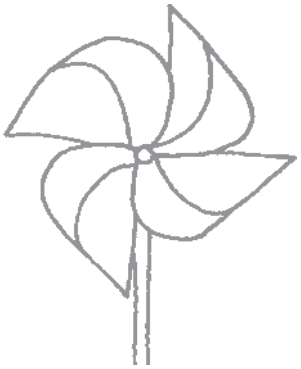


Mark a cross at each corner as shown.

3

Take the marked corner and bend it to the centre of the paper, then push a pin through them to hold them down.

4



It should now look like this.
Now attach a drinking straw to the pin.
Now blow into the windmill.

The way this simple windmill works is very similar to what happens in a section of the gas turbine engine called the Turbine.

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When you have tried the turbine out a few times think of things you could change about the turbine that would affect how fast it goes round. In your group make a list of as many as you can. Two ideas are given below to start you off:

- **The type of material we use to make the turbine**
- **The number of blades on the turbine**

When you have written down as many as you can, decide on one idea from the list to investigate.

Write your idea down as a question, for example:

What will happen if we make the turbine from different thicknesses of paper?

Try to make a prediction and if you can give a reason for it.
For example:

The thicker the paper the slower the turbine will turn. We think this will happen because turbines made from thicker paper will be heavier and more difficult to turn.

Write your own question and prediction in the space below.

Question

Prediction

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Now set up your turbine and test your prediction.
Remember to:

- **Work as a team**
- **Make sure you do a fair test**
- **Take measurements and write your results down in the table shown below**

	Order of how fast the turbine turned

Use this column to record the thing you changed about the turbine

In this column give a number to show where each one fits in the order of how fast they turned

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Now think about what your results tell you.

- **What did you find out?**
- **Was your prediction correct?**
- **Is there a pattern in the results?**
- **Could you improve your investigation?**

Use the space below to write a conclusion to your investigation that answers these questions.

Conclusion

Further investigation using the wind turbine:

If you have time, you could write another question which investigates a change you make to the turbine. Or you could:

- **Makes changes to the speed of the wind which blows on the turbine.**
- **Do some research on where wind powered turbines are used and what they are used for.**