

Flying Futures: Exploring Wind Tunnels

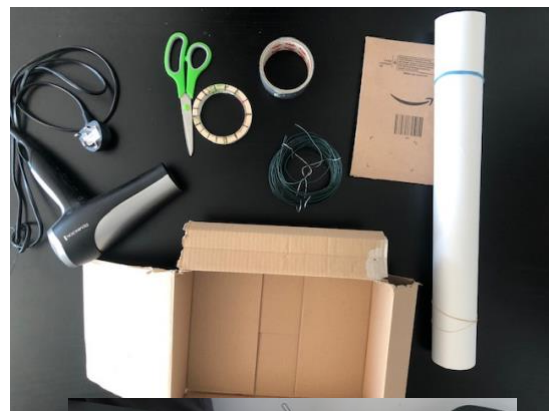
Aerodynamics is all about playing with an object to engineer how it will respond when moving through the air. For example, making it the right weight so it floats or making it the right shape so that it spins! If you have ever made a paper aeroplane, then you were playing with aerodynamics!

Check our Flying Futures: Exploring Wind Tunnels Video parts 1 & 2, you can find these at <https://ioi.london/newham/#Windtunnels>.

Free Standing Wind Tunnel

You will need:

- Cardboard box
- Masking Tape
- Plug point
- Hairdryer
- 4 x A3 card
- Duct Tape
- Wire or tape



1. Cut a hole in one of the bottom corners of your cardboard box. Push the hairdryer through so that it sticks out of the box. Use some masking tape to keep it in place and to make sure the hairdryer sticks out as far as it can.

2. We have to make sure the hairdryer is off the table below, as the heat that comes out the back end could damage your table or be a hazard. To do this, turn the box over and poke holes into it with some scissors. Use wire or cable ties to secure the hairdryer tight against the ceiling of the box. Now when you turn the box

3. Use some strong tape, like duct tape, to secure the hairdryer in place further. Try and get it so that the hairdryer blows straight upwards.

Please note: you must always change the setting of the hairdryer to the coolest setting to avoid any of your materials overheating.



4. Now take your cardboard envelope and cut a diamond shape into the short edge. Slip the envelope over the end of the hairdryer, diamond shape down.



5. Take your two sheets of A3 card and curve them into the envelope to make an open cone. Try to curve the small end of the cone so it is tight around the hairdryer. You now have your own wind tunnel. Use your art materials to test and experiment with aerodynamics.



Test it out with some of these materials:

- Kebab sticks
- Sellotape
- Paper
- Pieces of light fabric
- Tissue paper
- Plastic bags
- Balloons
- Rubber gloves
- Rubber bands
- Paper clips



Move-able wind tunnel

1. Take two more sheets of A3 card and make a new cone with them. The end of the cone should fit tightly over the end of your hairdryer.

2. Use some duct tape to secure the cone to the hairdryer and to make the cone stable so it doesn't flap.

You have your move-able wind tunnel!





Experiment Challenges

Now that you have your wind tunnel, get to work experimenting with your other materials to make flying objects.

- 1) Try and make something that shoots up high to the ceiling when you put it in the wind tunnel!
- 2) See what you can make that will hover just above the tunnel. Can you make something that spins?
- 3) Test what kind of flying objects you can make for the move-able wind tunnel!
- 4) If what you make doesn't fly, what can you do to the funnel to make them fly better? What can you do to the flying object?
- 5) How long can you keep them in the air? What stays in the air the longest?
- 6) How is it different now you can control the air? Is it easier or harder?