

ABOUT THE PROJECT

The Cube's *Wind Tunnel* project is a digital representation of a wind tunnel and demonstrates how air reacts as it passes over different objects.

Choose an object, set your parameters, and watch as smoke and particle effects help to visualise the air movement over the object.

Real-life wind tunnels use smoke or dye in the air to see how it moves around an object.



WIND TUNNELS & AERODYNAMICS

Engineers use wind tunnels to test the aerodynamic performance of different objects. Aerodynamics is the study of air (and other gasses) interacting with solid objects as they move through the air.

EXAMPLES OF AERODYNAMIC FORCES

- Thrust is the force which moves an aircraft through the air.
- When a plane is flying forward air moving over and under the wings is providing upward lift.
- The air pushing back on the plane slows it down, this is known as the drag force.
- Weight is the force of gravity acting to pull the plane to the ground.

ON-SCREEN ACTIVITY

1. Select the truck in the Objects panel. Position the airflow and select a flow pattern. Observe the flow as it moves around the truck.

- What is the truck's drag coefficient?

2. Select one of the aerofoils (wing shapes). Look at the airflow and note if it moves differently than it did around the truck.

- What is the aerofoil's drag coefficient?
- Is it greater or less than the truck's?

3. Experiment with other objects such as the cars.

- Which object had the smallest amount of drag?
- Why do you think this object had the least drag?

Tip: A low number for the drag coefficient indicates that the object has less air resistance.

Well done! You have completed the *Wind Tunnel* worksheet.