



Wind Tunnel

STEM Sims

Lesson 1: How Does the Shape of an Object Affect Air Resistance?

Objects experience drag when moving through a fluid, such as air. The faster the object moves through the fluid, the greater the air resistance. Does the shape of an object also affect air resistance?

Doing the Science

- 1. Open the Wind Tunnel Simulation.
- 2. Click on any of the objects on the table. The object moves to the spring scale above the wind tunnel. Note and record the shape and mass of the object in Table 1.
- 3. Slide the voltage lever on the wind tunnel to about halfway between 0V and 28V.
- 4. Click the “ON” button to turn on the fan motor. Note and record the new mass on the spring scale. This new mass is a measure of the force due to air resistance in addition to the force of gravity.
- 5. Calculate the “Apparent Mass Increase due to Air Resistance” by subtracting the original mass from the “New Mass on Scale.” Record this value in Table 1.
- 6. Click the “OFF” button to turn off the fan motor.
- 7. Click on the object hanging on the spring scale to return it to the table.
- 8. Click on a different object and repeat steps 4 – 7. Do this until you have tested all objects.
- 9. Slide the voltage lever on the wind tunnel to 28 V and retest all shapes at this voltage.

Table 1.

Trial	Shape	Mass (g)	Voltage (volts)	“New Mass” on Scale (g)	Apparent Mass Increase due to Air Resistance (g)
1					
2					
3					
4					
5					
6					
7					
8					

Do You Understand?

- 1. Which shape had the smallest air resistance?
- 2. What generalization can you make about the relationship between object shape and air resistance?
- 3. Open the Acceleration Module’s Vehicle Simulation. Which vehicle type in the Vehicle Simulation would have the greatest air resistance? Please offer an explanation for your choice.