# Bobsled

## *Try This!*

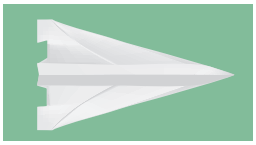
*Experiment with aerodynamics using a paper airplane made out of a sheet of 8.5 by 11 inch printer paper.*

Think of the time when you're holding the airplane and winding up to send it sailing through the air as the push-off—for the plane to fly, the plane has to accelerate from rest just like the athletes must get the bobsled moving from rest at the starting line. Like the bobsledders during the push-off, you need to keep the motion of the plane straight and steady, or it'll crash right when you release it.

**1.** If the paper airplane is travelling fast and smoothly when you're holding it, it will continue to travel in the same way when you let it go. Practice throwing your airplane until you can get it to fly straight and steady several times in a row. Right now, your airplane is very aerodynamic.

**2.** Cut one-inch slits on each wing along the middle fold. Fold the two flaps upward so that they are at a 90 degree angle from the wing. Throw your modified plane several times.

How does the plane fly after you add the flaps? Does it fly as fast and far as before? Why?



The paper airplane floated more and did not go as fast when the flaps were added. This is because the flaps added drag to the airplane, making it less aerodynamic.

**3.** If an object has more **mass**, it also has more **inertia**. So when a massive body is in motion, forces of friction have less of an effect on its velocity. For this reason, bobsled teams want to maximize the amount of weight in the bobsled. The weight limit in the four-man bobsled is 630 kg (including athletes and sled). If the team doesn't reach that weight, they are allowed to add metal weights to the sled.

Add a paperclip to the nose of your airplane along the base fold. How does it fly? Why?

The airplane should fly faster, straighter, and steadier because the paperclip added mass — and inertia — to the airplane, making it more resistant to change in its motion and less affected by forces of friction like air resistance.