

Welcome to Family Science Night!

What does the Wonder Whirler do as it drops?

How many of you have flown a kite?

Who has flown in a helicopter or airplane?

Purpose:

Observe some properties of air pressure and aerodynamics, making and experimenting with a Wonder Whirler.

Make your own Wonder Whirler!

Materials:

Copy of Wonder Whirler

Scissors

Paper Clips

Cut around the outside of the Wonder Whirler on the solid lines.
Do not cut on the inside solid lines.

Cut on the dotted lines.

Fold the two flaps back in opposite directions – one blade toward you and the other away from you. The whirler will look like a T.

Fold the cut sides into the middle. This will create a skinny stem.

Fold the handle up about an inch (opposite the blades).

Hold the Wonder Whirler high over your head (or throw it up into the air). You may need to stand on a chair above the ground. Drop the Wonder Whirler and observe what happens.

Attach a paper clip to the end of the handle. Throw your Wonder Whirler into the air. Observe how it falls.

Add another paper clip or two. Observe how the behavior of the Wonder Whirler changes.

Remove the paper clips. Observe how the Wonder Whirler behaves as it is dropped.

Experiment with the Wonder Whirler and see if you can cause it to spin in the opposite direction as it falls.

Use different types of paper to create a Wonder Whirler. Observe if the behavior of the whirler changes.

Investigate:

Wonder Whirler

Test	Observations Describe what you see.
One Paper Clip	
Two Paper Clips	
Three Paper Clips	
<u>No</u> Paper Clips	

Observations:

When more paper clips were added ...

When no paper clips were added ...

Make any additional predictions and design experiments to further test your predictions.

More questions to ponder:

- ◇ What does the Wonder Whirler do as it drops or falls?

- ◇ Does the Wonder Whirler always spin in the same direction?

- ◇ Does the Wonder Whirler's speed of rotation change as paper clips are added or removed?

- ◇ Does the Wonder Whirler's direction of rotation change as paper clips are added or removed?

The blades of the paper Wonder Whirler turn as air pushes on the body of the whirler. The speed of the blades' rotation is affected by the weight of the whirler. Air rushes out from under each wing in all directions as the whirler falls. The air hits against the body of the whirler, triggering it to rotate. Adding paper clips increases the weight of the whirler, causing it to fall faster. The flow of air against the body of the whirler strengthens, thus increasing the blades' rotation speed. However, when too much weight is added, the whirler is pulled down with such a force that the wings are pushed upward. The wings are no longer able to provide lift or rotation. There is a lack of air resistance.