EXPERIMENT: "COANDA EFFECT"

What do you think will happen when you try and blow out a candle with a box in the way versus a can. Will you be able to blow out the candle with the box blocking it? Or the can? Write your hypothesis (best guess) below.

HYPOTHESIS:_____

_____

Materials Needed

- One Candle
- One small box & one can that are about the same width.

ADULT SUPERVISION REQUIRED

Step 1

Put a candle behind a box as shown and try and blow it out. What happened?

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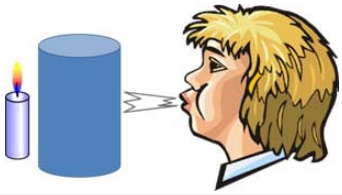
_____

Step 2



Repeat the experiment, but this time use a round can.
What happened?

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_____

Conclusion

Did the flame go out in both cases, or only one?

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So What Happened?

How does it work?

You found that the candle blew out only with the round can. In the 1930's Henri Marie Coanda discovered that a fluid (air is a fluid) has a tendency to follow a curved surface. He later used this in the design of an airplane that would utilize this "Coanda effect" to its greatest potential. An airplane flies for many reasons, including Bernoulli's principle and the wing's angle of attack. But one of the reasons a wing has lift is the Coanda effect.

Look at the diagram above. Notice that the air traveling over the wing "hugs" the surface of the wing. Because of this, as the air leaves the wing it is traveling in a downward direction. Newton's third law states that for every action there is an equal and opposite reaction. So if the air is going down, the wing must go up.

How does this relate to race cars?

You may have noticed the race cars usually have spoilers on the back. Why do you think they are there? Draw a side view of a car (without a spoiler) and draw a dotted line showing how the air flows (like the side view of the wing above). You'll notice it is similar in shape to a plane's wing. Without the spoiler, is the downward travel of the air is "lifting" the back of the car making it lighter with less traction? How does the spoiler help with that?