Activity: Bernoulli’s Principle

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This activity is designed to get students thinking about and experimenting with lift by exploring Bernoulli’s principle.

Materials:

Paper

Items for Bernoulli demonstration (depends on student’s demonstration choice). This will likely require various items from around the home.

Before getting too deep into the concept of lift and Bernoulli’s principle, start with some demonstrations!

* Ask the student what birds, flying insects, and airplanes all have in common. The answer? Wings!
* Ask the student if they know what wings have to do with flying. They may conclude that the air around the wings helps them fly, but they likely don’t know how it works.
* Have the student take a piece of paper and hold the end right above their top lip. Ask them what they think will happen to the paper when they blow air underneath it. They will say the paper will lift because they are blowing air underneath it (pretty obvious, right?). Try and see.
* Now have them hold the end of the paper right below their bottom lift. Ask them what will happen when they blow. They will probably think nothing will happen because they are blowing air right over top of the paper. Try it and see. The paper still lifts up!
* Video of this demonstration found at <https://www.youtube.com/watch?v=MYXiL2wGDAw>
* Next, have them fold a piece of paper in half so that it forms a tent. Set the tent up on the table and ask the student what will happen if they blow through the center of the tent. They might think that it will blow away. Try it and see. The paper flattens out!
* Video of this demonstration found at <https://www.youtube.com/watch?v=eqemk4Sa_m8>

Discussion: Ask the student what made the paper lift and the tent flatten. Explain that this is called Bernoulli’s principle, and it has to do with pressure of the air! This same principle is how birds, insects, and planes fly.

* Show this video explaining air pressure on plane wings. <https://www.youtube.com/watch?v=bv3m57u6ViE>

Activity: Becoming Bernoulli

Pretend you are Daniel Bernoulli and are explaining your principle of lift to other scientists. How will you demonstrate it to them?

* Create a writing piece, voice, or video recording explaining how your activity demonstrates Bernoulli’s principle.
* Gather materials and complete your demonstration. Parents/guardians/family members can help as well, it’s not cheating!
* Practice your demonstration to make sure it appropriately demonstrates Bernoulli’s principle, making modifications if necessary.

This doesn’t need to be an extravagant demonstration, something simple like the two demonstrations with paper is enough.

Extension:

How do other flying objects, like helicopters, insects, and birds use Bernoulli’s principle for achieving lift? Do some research online and then report your findings to a family member.