

# JUST FOR U.S.\*

GRADES 4 - 5

\*Understanding Science

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Do you like watching airplanes?

Do you love to see them soaring above the buildings,  
or flying through the clouds?



Do you wonder how that  
big, heavy airplane gets  
in the air?!



The first airplane was invented 100 years ago by Orville and Wilbur Wright. They worked hard to invent the airplane. They built planes that did not work, but they did not give up. Finally, on December 17, 1903, Orville flew for the first time!

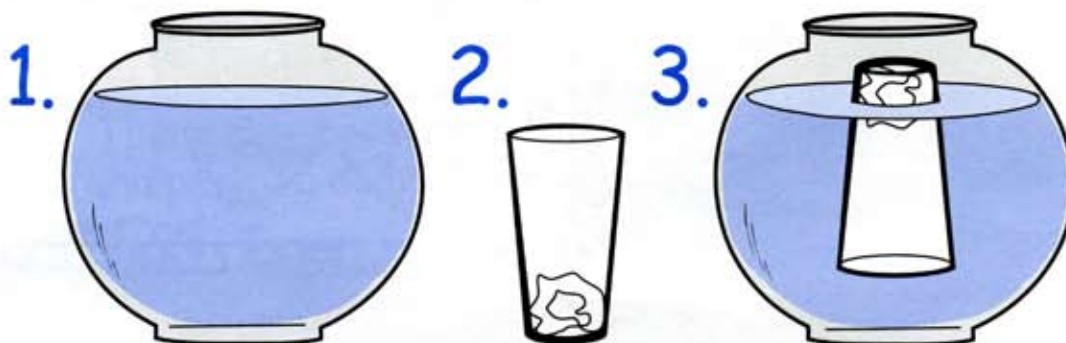


Many people had tried to invent an airplane before the Wright brothers. The Wright brothers succeeded because they studied AIR. They realized they could use air to lift up the plane. Therefore, to understand how planes can fly, you need to understand AIR and AIR PRESSURE and LIFT just like the Wright brothers.



Here is an easy trick to show there is air.

1. Fill a bowl with water. 2. Take a piece of paper and put it in the bottom of a glass. 3. Turn the glass upside down. Put it straight in the water. 4. Take the glass out. Is the paper wet? It isn't! Why not? Air was in the glass, so the water did not go in.





## AIR PRESSURE

Air is always pushing on things.  
This is called AIR PRESSURE.

Normally, the air pressure on all sides of an object is the same.

Sometimes however, the air around an object is not the same pressure. When this happens, the air moves from the higher pressure side to the lower pressure side. As the air moves, it can push hard enough to knock things over. Think of a tornado!

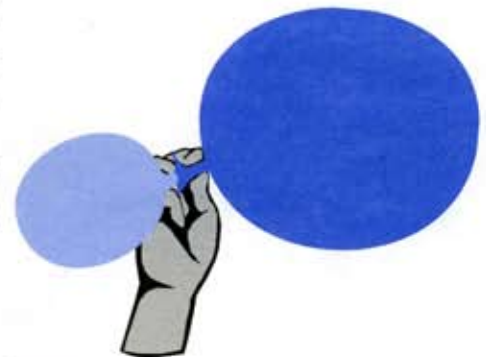


To help understand PRESSURE, try this neat trick.  
It's great for fooling adults.

Take two balloons that are the same size.  
Blow up one balloon a little. Blow up the other  
balloon a lot.



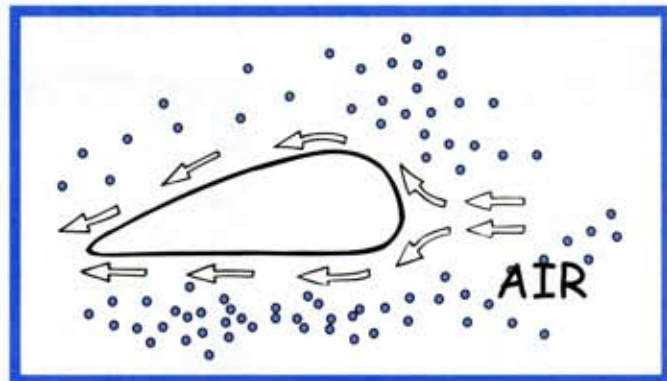
Put the end of one balloon inside the end  
of the other balloon. Keep the balloons  
pinched. Ask someone to predict what  
will happen when you let go. Most people  
believe the balloons will become the same  
size, but they won't!



In fact, the little balloon gets smaller.  
This happens because its pressure is higher.  
(Think about it. A balloon is much harder to blow into when  
you first start. This is because of the higher pressure.)

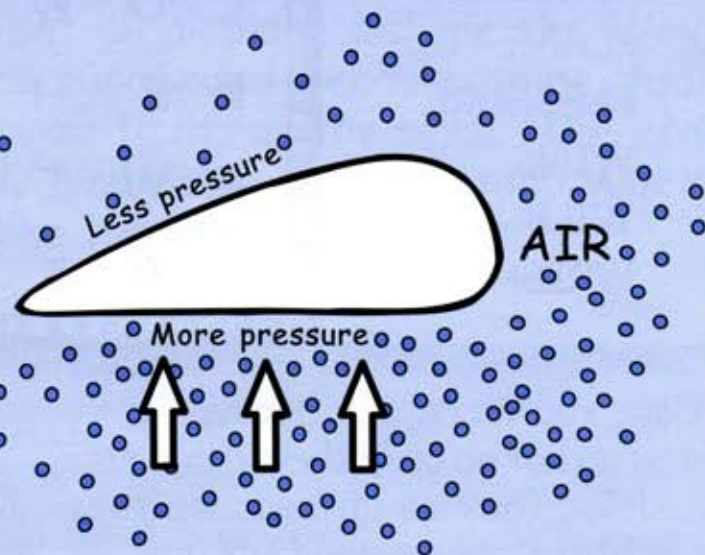


The Wright brothers realized they could use air pressure to push planes up. They did this by designing wings which, as the plane moved, made the air above the wings move faster than the air below the wings. This makes the air pressure just below the wings higher than the air pressure just above the wings. (This is known as Bernoulli's principle).



## LIFT

As the plane goes faster, the difference in air pressure above and below the wings gets bigger so the air below pushes harder. When the difference is big enough, the air below pushes the plane up. This is called LIFT.



Here is simple way to show lift. Blow on the air above a tissue. You would expect the tissue to blow down. Instead it lifts up!



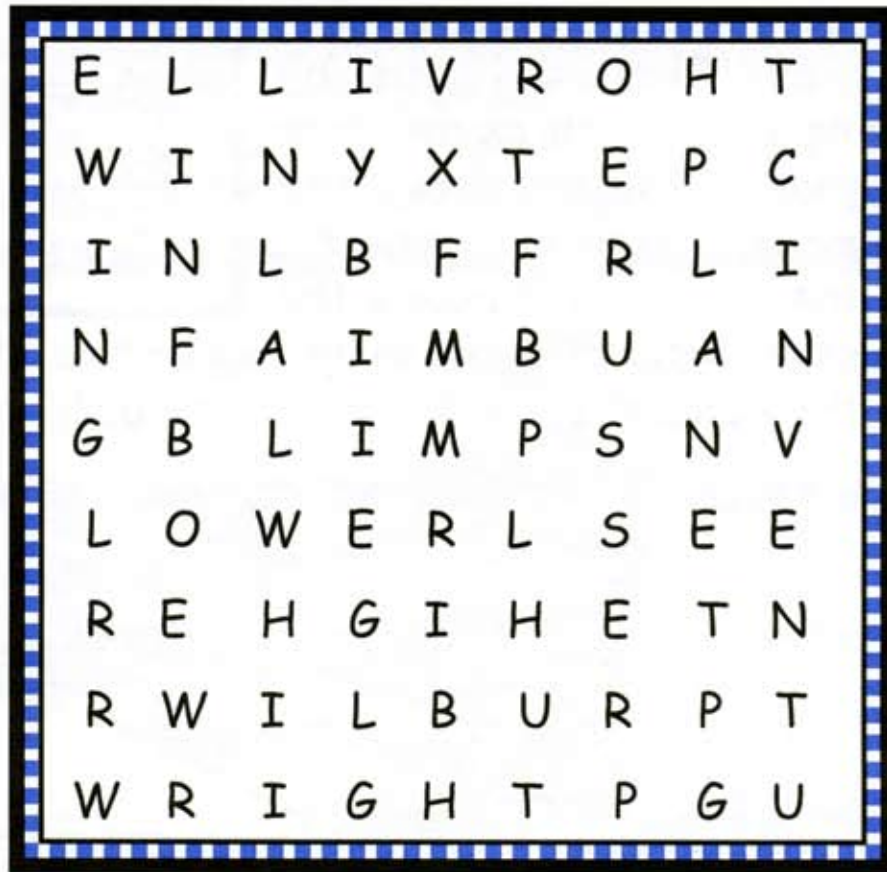
The Wright brothers built the first airplane because they realized they could use air to keep the plane up. In fact, planes cannot fly in space because there is no air!





CAN YOU FIND THESE WORDS?

AIR  
 BLIMP  
 FLY  
 HIGHER  
 INVENT  
 LIFT  
 LOWER  
 ORVILLE  
 PLANE  
 PRESSURE  
 WING  
 WILBUR  
 WRIGHT



In Case You Were Wondering...

Blimps do not go up in the air because of LIFT. They go up because they are lighter (less dense) than air. Another way to think about it... blimps float in air for the same reason a ping pong ball floats in water.



One Last Note:  
 Most of the Wright children had unusual names. Do you have an unusual name?



Time for dinner  
 Reuchlin, Lorin,  
 Wilbur, Orville  
 and Katharine!

REPORT FROM Just for U.S. Call-In.

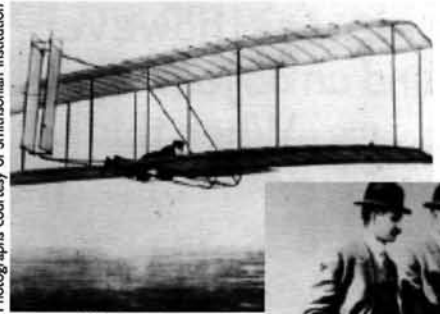
The most favorite "Did you know..." was that mosquitoes do not bite with teeth! Thanks to everyone who called!



To celebrate airplanes, Fernbank Science Center is hosting talks on Friday nights from 6:30 p.m. - 7:45 p.m. All of the talks are free and no reservations are required.

- February 7 Historical Milestones of Flight: The Georgia Aviation Hall of Fame
- February 18 Paul MacCready (Tuesday)
- February 21 Famous Black Aviators
- March 7 Women in Aviation
- March 21 Greenland Expedition
- April 4 Pilotless Flight
- April 18 Pre-WWI - Golden Age of Aviation
- May 2 Wright Experience
- May 16 Military and X-Planes
- June 6 Nothing General about General Aviation
- June 20 The Business of Aviation
- July 11 The Legacy of Apollo
- July 18 NASA Spinoffs: From Space Into Your Home
- August 1 Keeping Aviation Safe for All of Us
- August 8 Incredible Age of Aviation
- August 15 Vintage, Warbirds, Aerobatics, Homebuilts, Seaplanes, Ultralights
- September 5 The Mighty 8th Air Force in WWII
- September 19 Owning your own Airplane
- October 3 100 Years of Aviation History Right Here in Warner Robins, GA
- October 17 Looking Ahead Back to the Future
- November 7 Careers: What's out there for you?
- November 21 Learning to Fly
- December 5 Impact of Aviation on the Community

Photographs courtesy of Smithsonian Institution



Wright plane



Orville (left) and Wilbur Wright



Updates about the Centennial of Flight celebration can be found at <http://fsc.fernbank.edu/flight/>

You can also join us February 22, 2003 from 9 to 3 at our Georgia Arbor Day Celebration. There will be storytelling, forest walks, scavenger hunts, papermaking and planting demonstrations! The first 100 children who visit will get a free tree!

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Graphics by Sheila Ward.

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