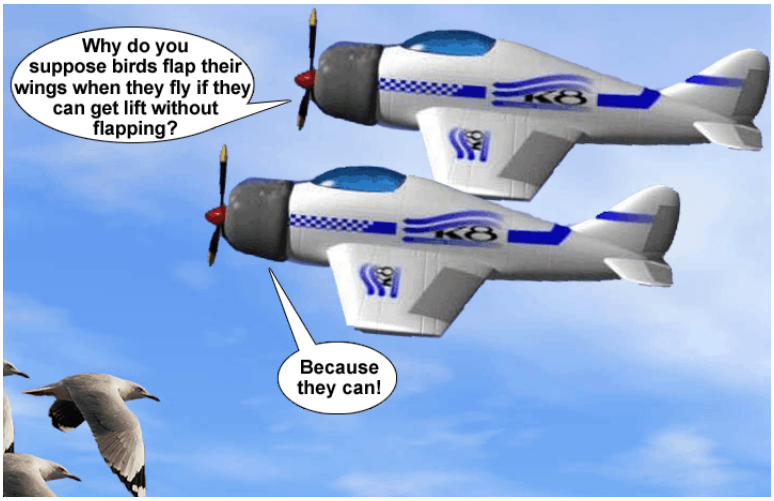
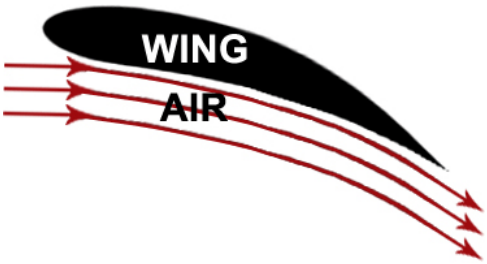
How Planes Fly



It is more obvious what happens when a bird flies than when a plane flies, because a bird flaps its wings. When the bird presses downward with its wings, Newton's Third Law tells us that the air will press upwards against the bird. This upward reaction force is called lift. Human beings can't fly like birds because they can't produce enough lift to overcome their own weight. How does a plane get lift? It doesn't flap its wings.

At first, it might seem that air rushing over the wing reduces the pressure creating lift (Bernoulli's principle), but air is rushing under the wing too. The lift comes from the fact that the wing turns air in a downward direction. (See the diagram to the right.) In order to turn the air downward, the wing must exert a downward force. As a result, according to Newton's Third Law, the air must exert an upward force generating lift. If the lift is greater than the weight of the plane, the plane flies.



The wing forces the air downward generating lift.

Answer the questions below based on your reading above, and on your knowledge of physics.

1. What causes lift in bird flight? _____

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2. What causes lift for airplanes? _____

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3. How is bird flight similar to flight in planes? _____

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