

Vocabulary: Air Pressure & Flight

Vocabulary

air: The mixture of gases that make up the earth's atmosphere.

- Air takes up space (it has volume)
- Air has weight

pressure: A force acting on an area.

- Pressure is equal to the force exerted on a surface divided by the total area over which the force is exerted.
- Pressure = $\frac{\text{Force}}{\text{Area}}$, or $\frac{F}{A}$

air pressure: The force air exerts on a given area.

- Air pressure is the pressure exerted by the atmosphere—it can also be called atmospheric pressure.

volume: The amount of three-dimensional space something takes up.

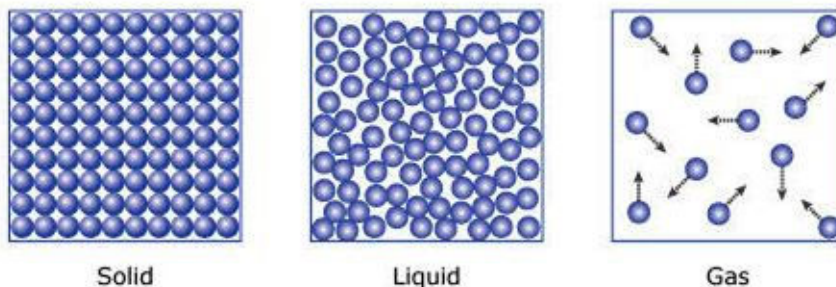
Boyle's Law: Boyle's Law states that the volume of a gas (such as air) is inversely related to its pressure. This means that as the volume of the gas increases, the pressure decreases and vice versa.

- Pressure x Volume = A Constant Value, or $P \times V = \text{const}$

states of matter:

The states of matter are solid, liquid, and gas.

- In a solid, the molecules are tightly packed and vibrate in place
- In a liquid, the molecules are more loosely packed than in a solid and they can slide past one another, but are still pretty close together
- In a gas, the molecules are much farther apart than in a solid or liquid and they are free to move past one another and all around



- Because the molecules are so spread apart, gases are the easiest state of matter to compress (press into a smaller volume)

vacuum: A space where there is no air pressure.

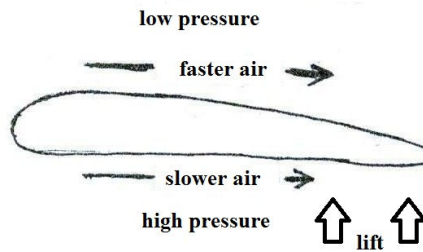
fluid: A material that can easily flow.

Bernoulli's

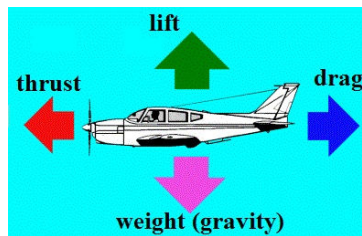
Principle:

Bernoulli's Principle states that as the speed of a moving fluid increases, the pressure within the fluid decreases.

- Bernoulli's Principle on an airplane wing, resulting in lift:



flight forces: The basic forces of flight that are sets of opposing forces that act upon one another. The forces are lift and weight (gravity), and thrust and drag.

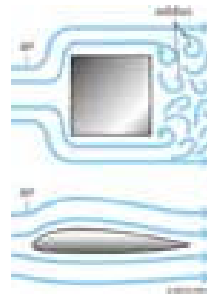


angle of attack: The angle between the airfoil and the undisturbed relative airflow.

airfoil: A part or surface, such as a wing, whose shape and orientation control lift.

aerodynamics: The science of how objects move through the air.

top: high drag on a less aerodynamic shape



bottom: low drag on a more aerodynamic shape