AEROPHANTOM

Different Types Of AirFoils

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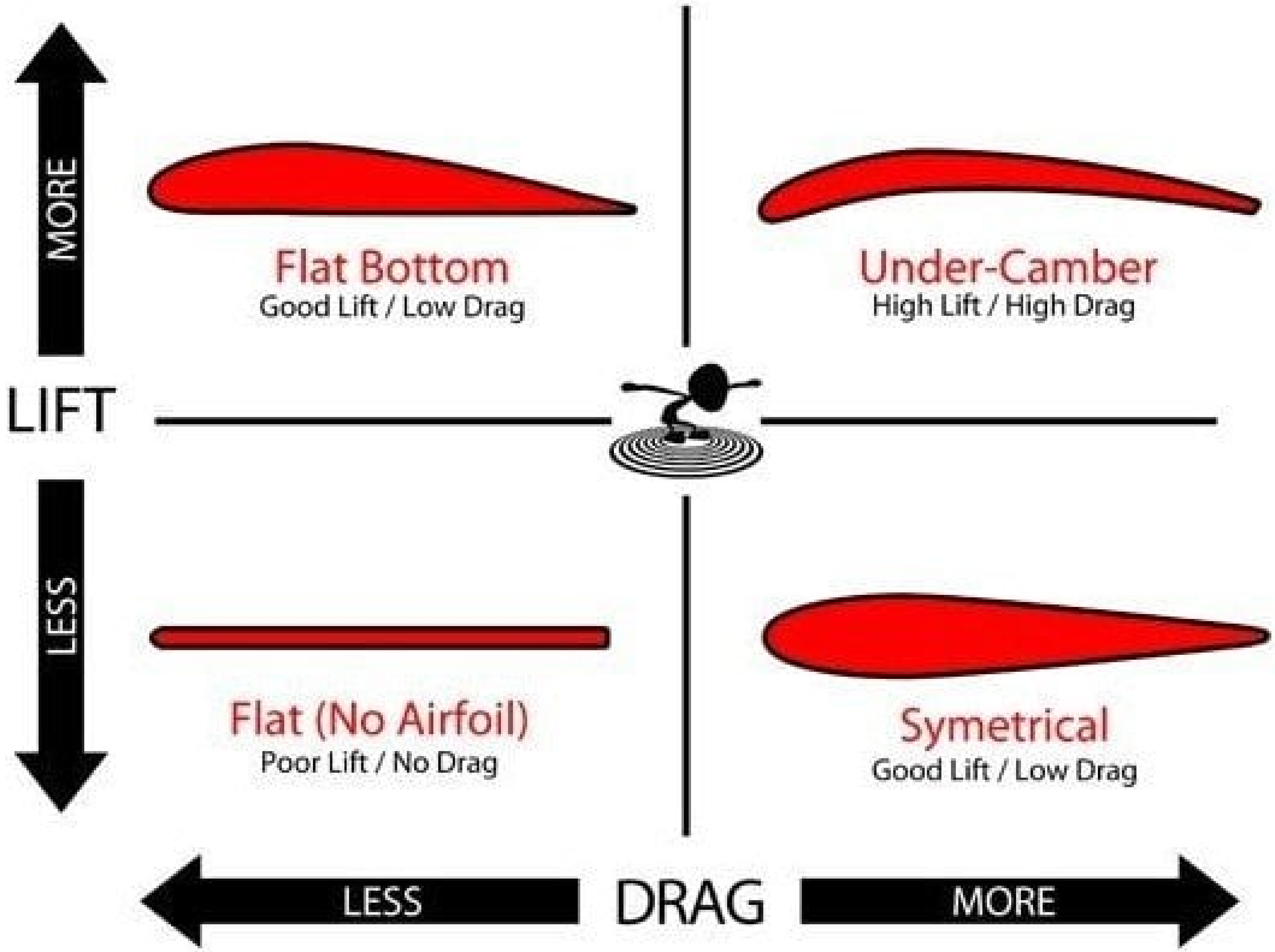
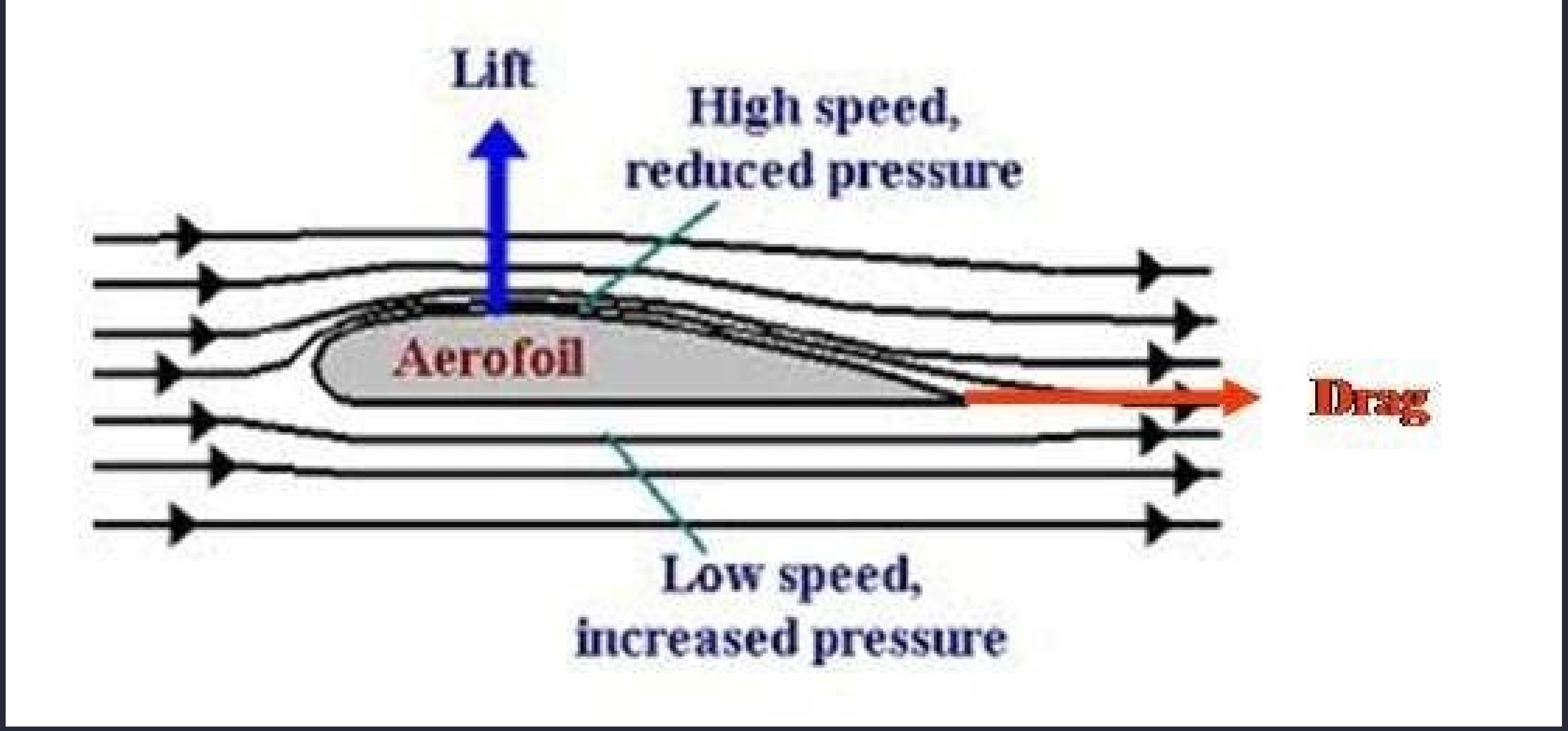


Introduction

Welcome to the world of airfoils! In this presentation, we will explore the secrets behind different airfoil designs and their impact on flight. We will delve into symmetrical, flat bottom, and under cambered designs, and understand how Bernoulli's Principle plays a crucial role in their performance. Get ready to unravel the mysteries of airfoils!

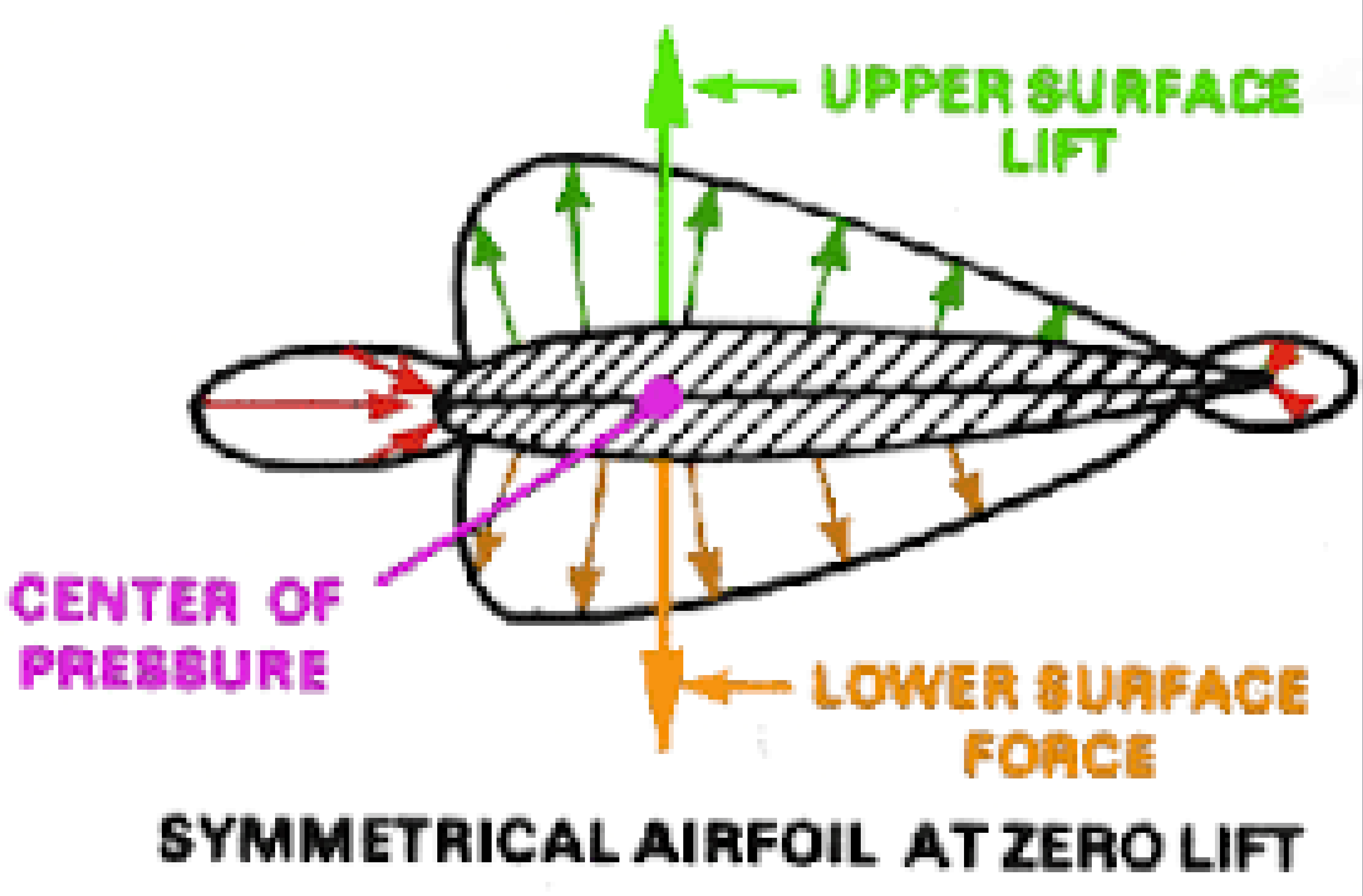
Bernoulli's Principle

Bernoulli's Principle is a fundamental principle that contributes to lift generation. It explains how the pressure difference between the upper and lower surfaces of an airfoil creates an upward force (lift) as air flows over the wing. However, it's important to note that while Bernoulli's principle is a significant factor in lift generation, it's not the sole contributor. Other factors, such as the angle of attack, wing shape, and air viscosity, also play roles in determining an airfoil's overall aerodynamic performance.



Symmetrical Airfoils

Symmetrical airfoils have the same shape on both sides, resulting in equal lift at zero angle of attack . Symmetrical airfoils are often used in applications where lift is not the primary concern.



Air Effect

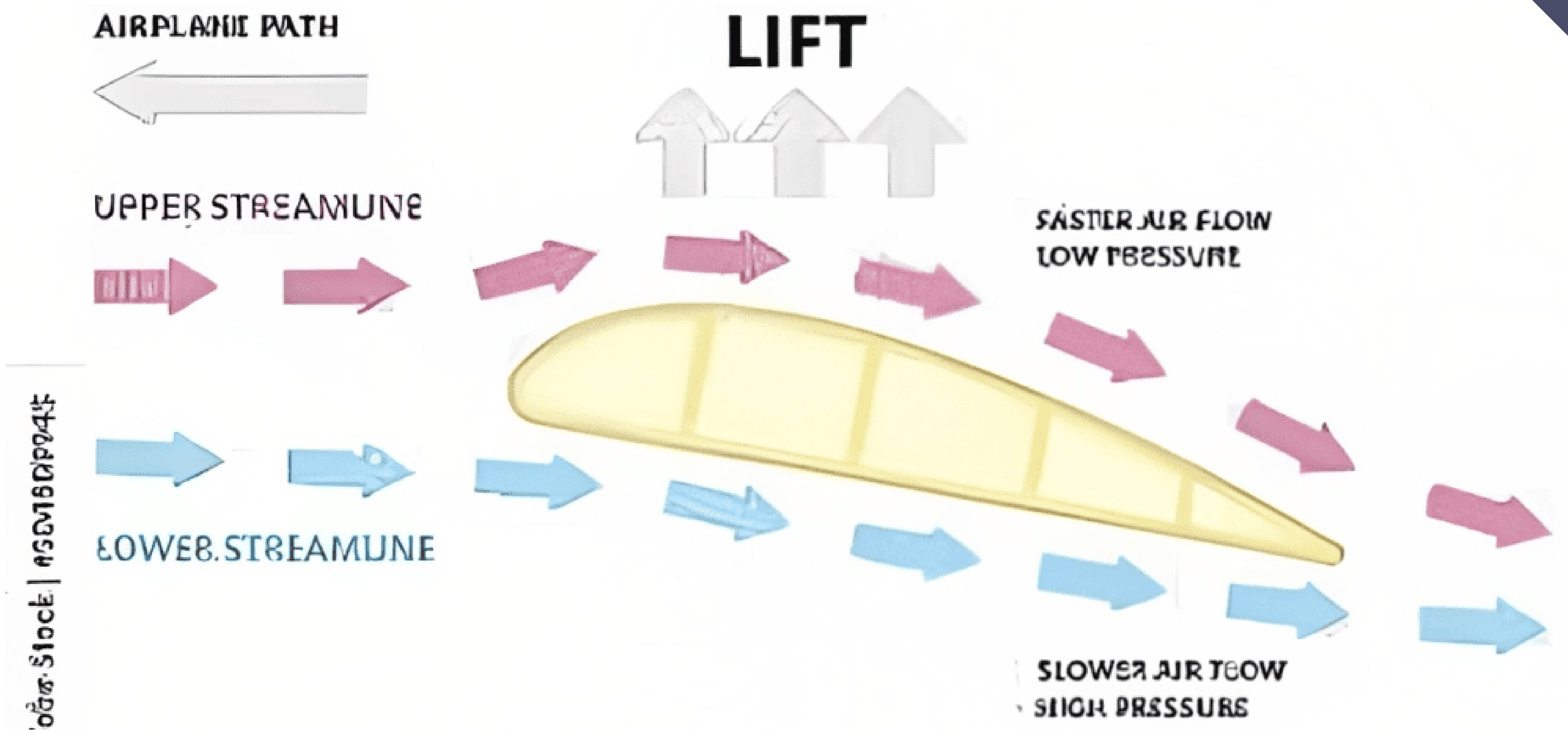
In a symmetrical airfoil, when the angle of attack increases, the airfoil's upper and lower surfaces experience similar changes in pressure, resulting in minimal lift generation.

Uses

They are favored in aerobatic aircraft where rapid changes in pitch are important.

Air Effect

As air flows over the curved upper surface of the flat bottom airfoil, it must travel a longer path and therefore accelerates, resulting in lower pressure on the upper surface. This pressure difference generates lift.



Flat Bottom Airfoils

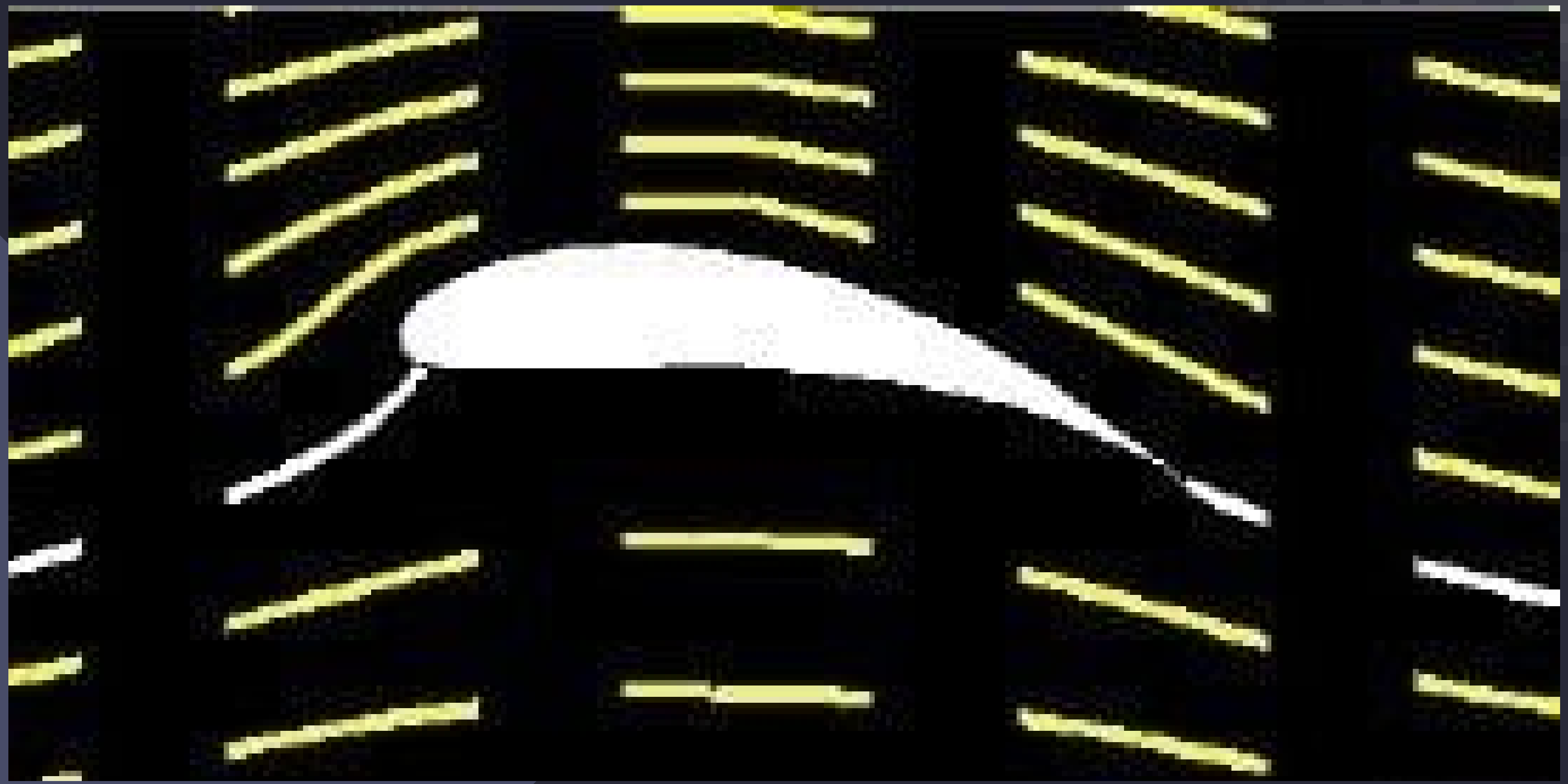
With a **flat bottom**, as the name suggests, has a flat lower surface and a curved upper surface. This type of airfoil generates lift by having a pressure difference between the upper and lower surfaces..

Uses

Flat bottom airfoils are often used in simple and lightweight aircraft designs, such as model airplanes or ultralights. They are relatively easy to manufacture and provide sufficient lift for certain low-speed applications.

Under Cambered Airfoils

Under cambered airfoils have a **curved upper surface** and a **convex lower surface**, creating a longer path for the airflow. This design enhances lift at lower speeds, making it suitable for light aircraft and gliders. Explore the benefits and considerations of under cambered airfoils in this segment.



Uses

In specialized applications where slower flight speeds and high lift are desired, such as some gliders and model aircraft.

Air Effect

The curved shape of the airfoil's upper surface increases the velocity of the air above the wing, causing a pressure drop and generating lift. The undercambered shape allows for more lift at lower angles of attack compared to symmetric or flat bottom airfoils.