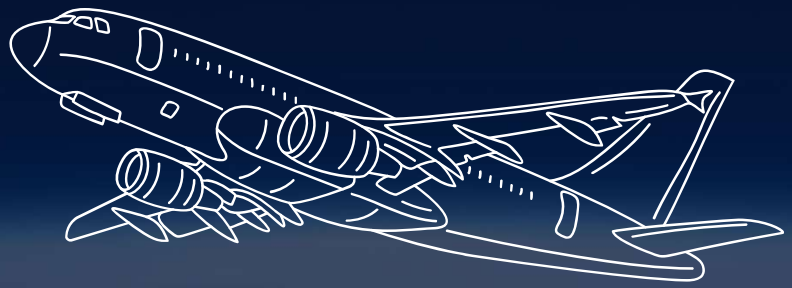
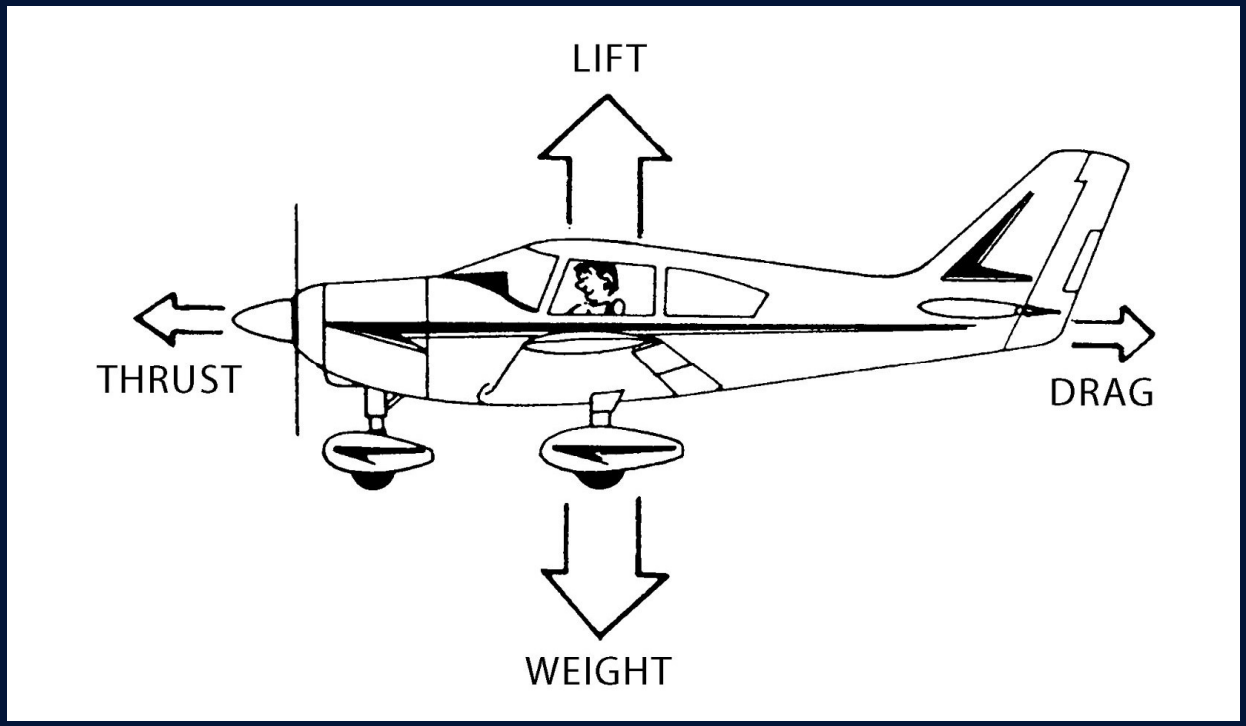
The Center for the Development of the Gifted and Talented
香港科技大學資優教育發展中心

# "Crafting" Engineering in the Air



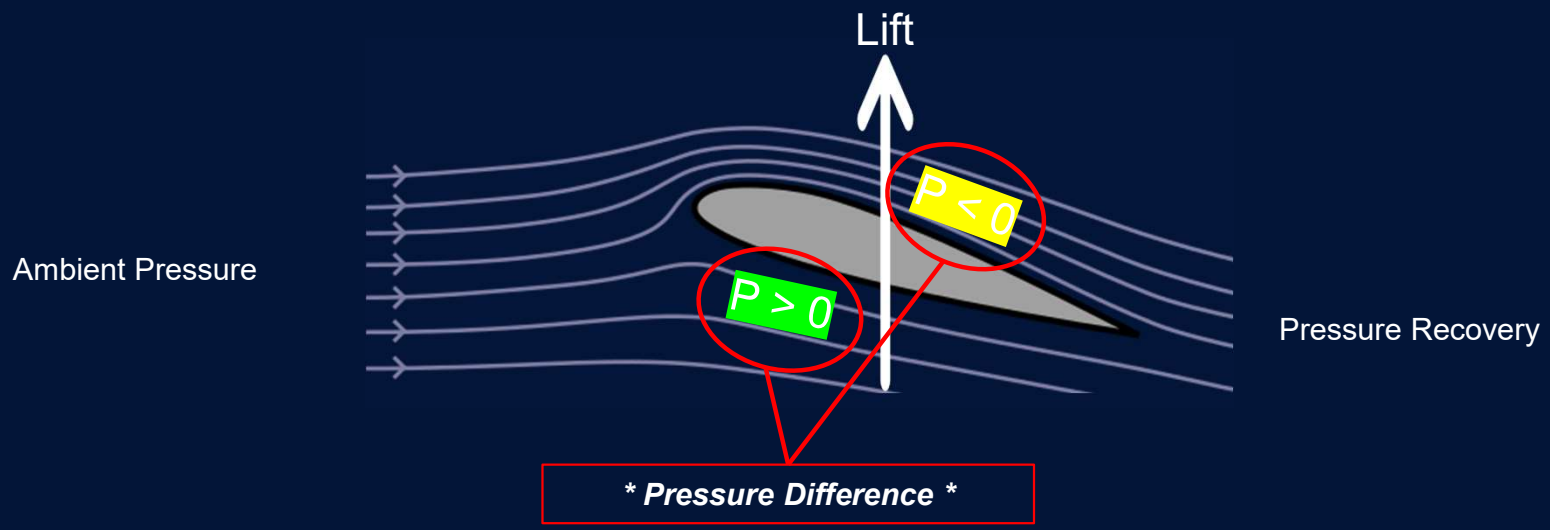
where your FLIGHT begins

# 4 Forces in Aerodynamics



# The Bernoulli's Theorem Explanation of Lift

- Suction surface: Velocity increases → Pressure decreases




- Pressure surface: Velocity decreases → Pressure increases

## Equations

$$Lift = \frac{1}{2}\rho V^2 S C_L$$

$$Drag = \frac{1}{2}\rho V^2 S C_D$$

$\rho$ = air density
V = freestream velocity
S = wing reference area
$C_L$ = coefficient of lift
$C_D$ = coefficient of drag

## Why $C_L$ $C_D$?

As long as the wing planform and wing configuration do not change, the coefficient of lift and drag will be the same with corresponding the angle of attack regardless of the change in wing size.

No need excessive **time** and **money** to build a 1:1 wing to calculate the actual amount of lift and drag