Research on the Relationship Between Angle of attack , Lift and Air resistance

Principles 1

- Air resistance and lift is proportional to velocity squared.

$$L = \frac{1}{2}\rho V^2 SC \qquad D = \frac{1}{2}\rho V^2 SC$$

L: Lift
S: Surface area
C_L: Coefficient of Lift
ρ : Density of Fluid

D: Drag
V: Velocity
C_D: Coefficient of Drag

Principles 2

- Lift-drag ratio is constant.

$$\frac{L}{D} = \frac{\frac{1}{2}\rho V^2 SC}{\frac{1}{2}\rho V^2 SC} = \frac{C}{C} \cdots\cdots$$

Constant

Purpose

1.To prove the principles by using alternative apparatus set

2.To find out what happens to lift-drag ratio when changing the angle of attack

Hypotheses

From the equations,

❖Air resistance and lift are proportionate to velocity squared.

❖Lift-drag ratio is constant.

❖Lift-drag ratio decreases after the angle of attack exceeds a particular value.

Procedures

(Experiment Ⅰ)

1. We used the wing and measured the lift.
2. We drew a graph of the interrelation between the lift and the angle of attack.

(Experiment Ⅱ)

1. We used the same wing that we used in experiment Ⅰ and measured the air resistance.
2. We drew a graph of the interrelation between the air resistance and the angle of attack.

Image of Alternative Apparatus 1

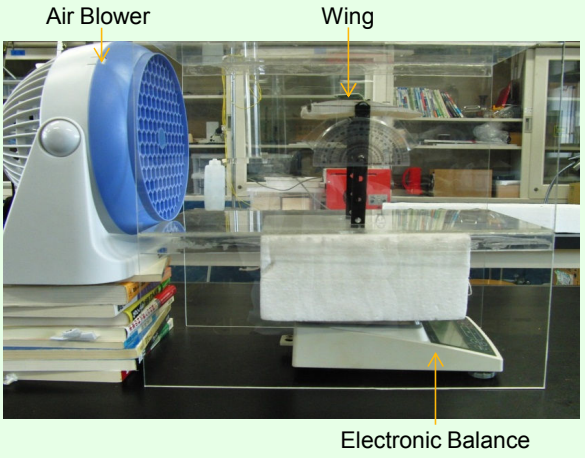
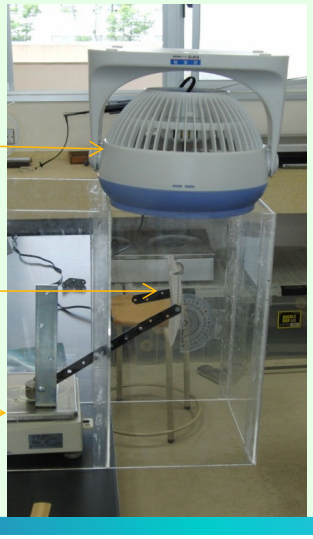


Image of Alternative Apparatus 2



Results of the Experiments

Sorry, we haven't got enough data to draw a conclusion.

We are going to measure the air resistance and the lift.