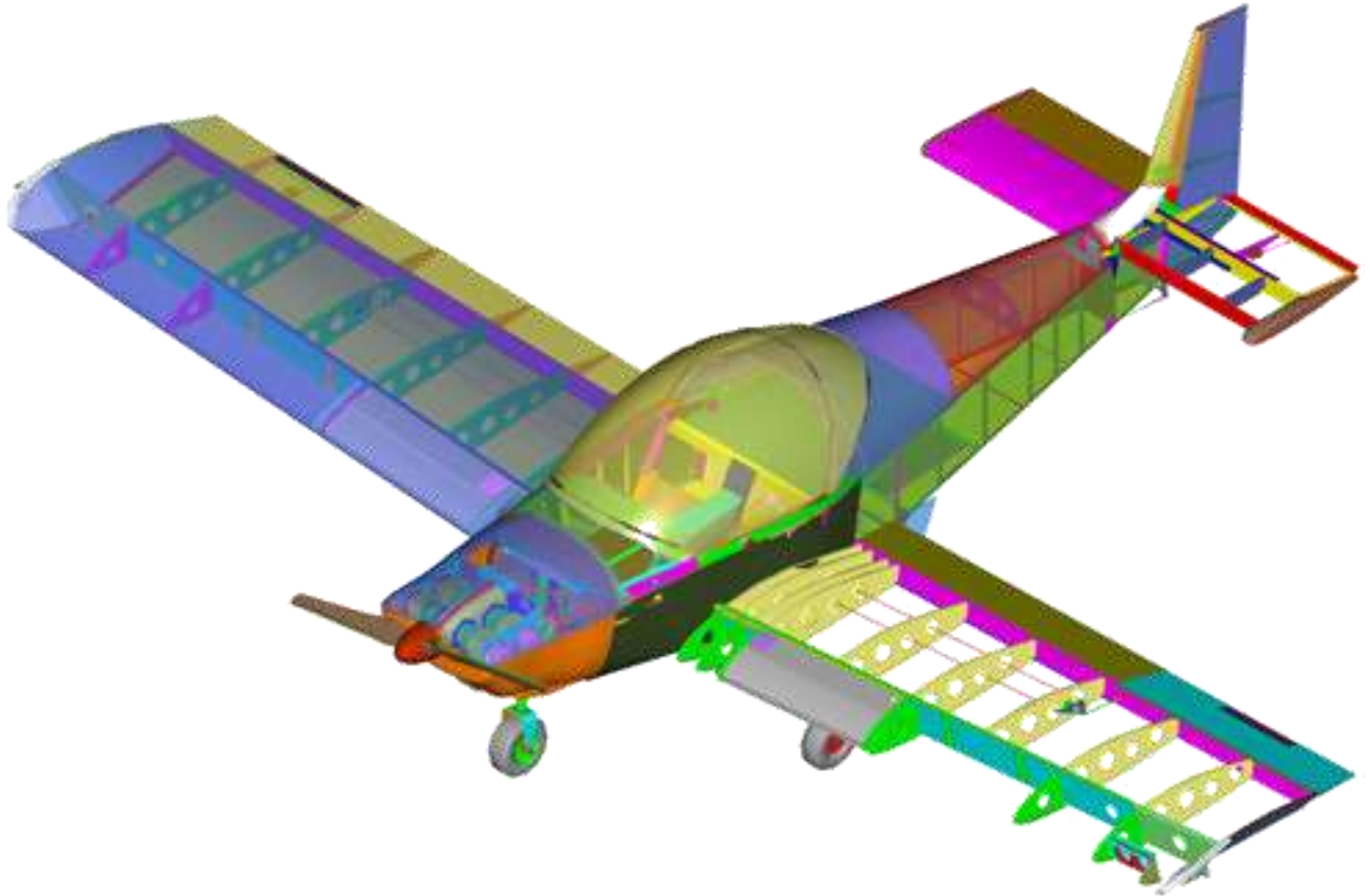
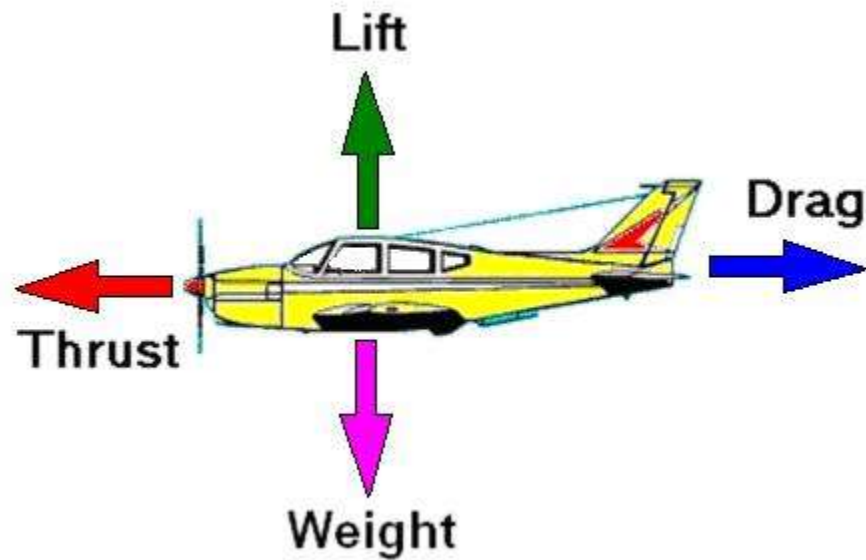


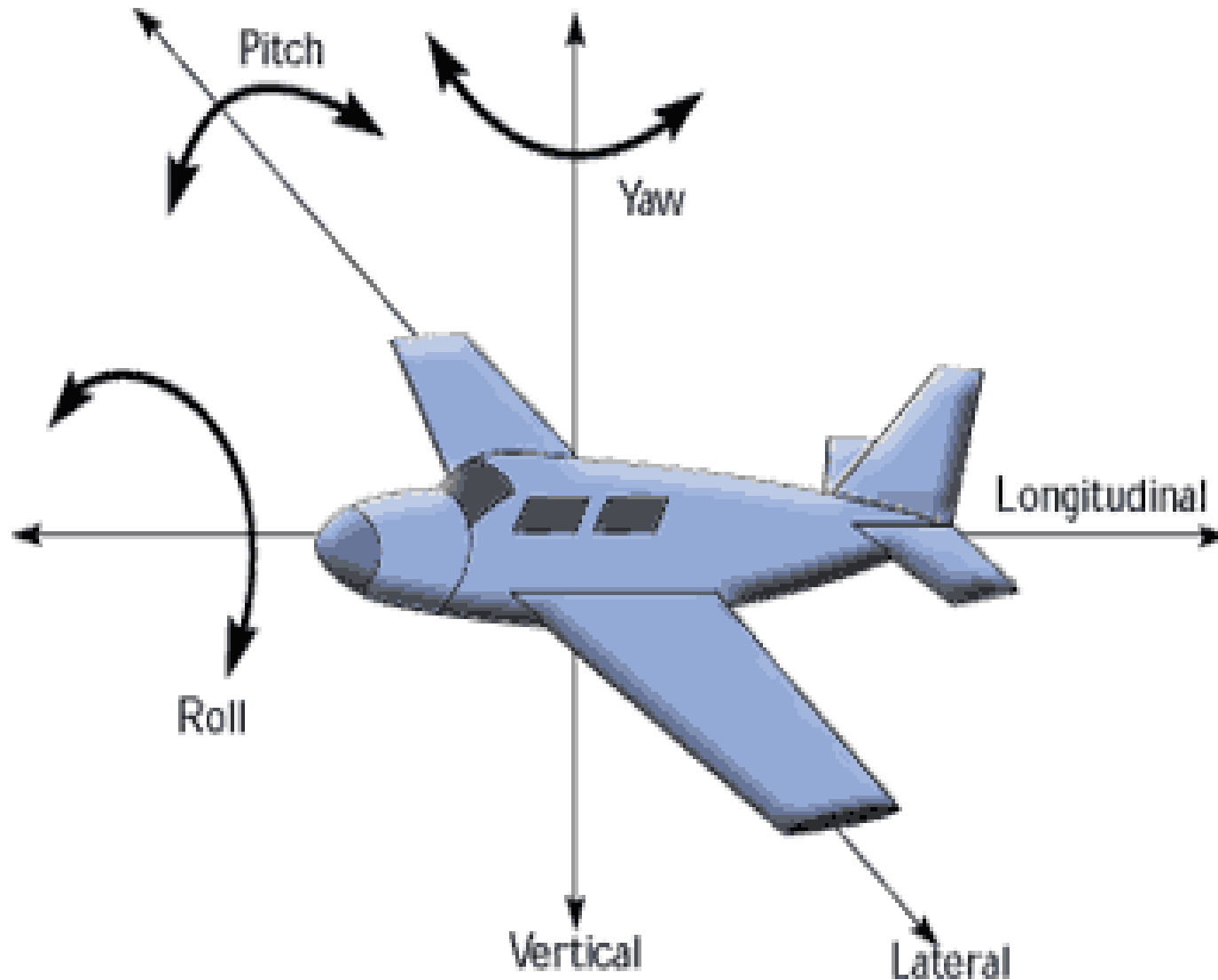
# Basic Aircraft Control System



# FORCES ACTING ON AN AEROPLANE

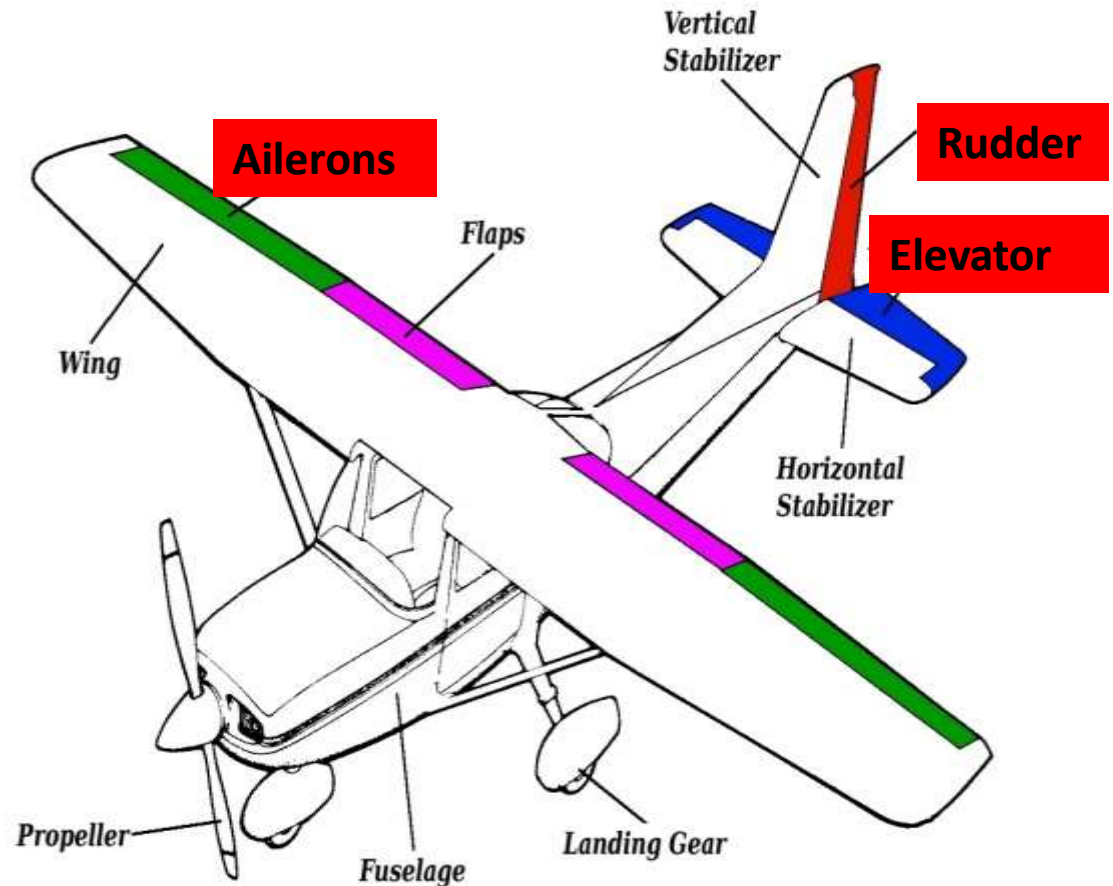


# THREE AXIS OF ROTATION



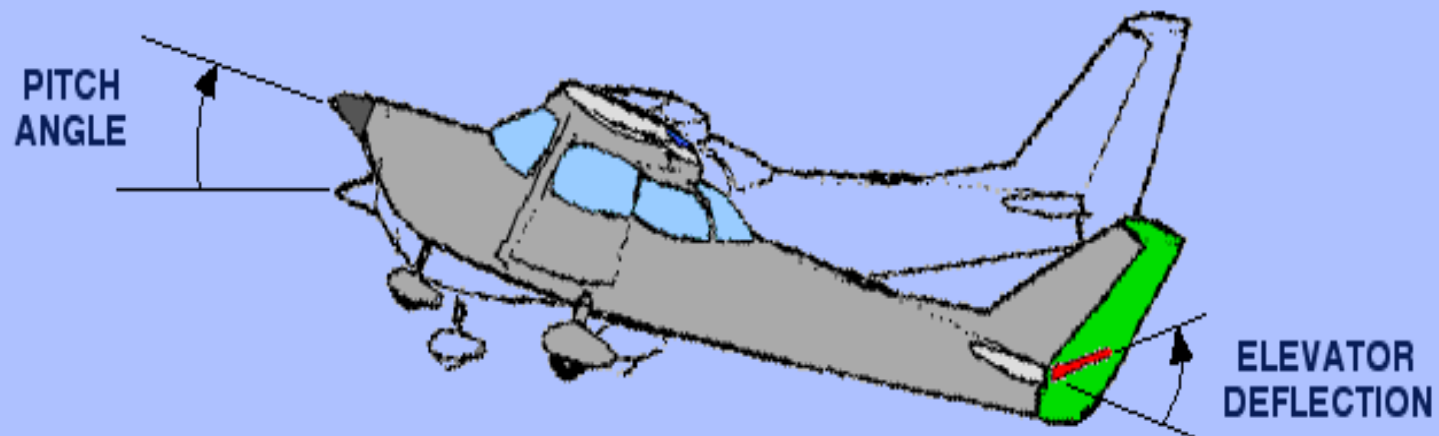
# Control Surfaces

- **Ailerons**
- **Elevator**
- **Rudder**



# The Elevator Controls the Pitch Angle

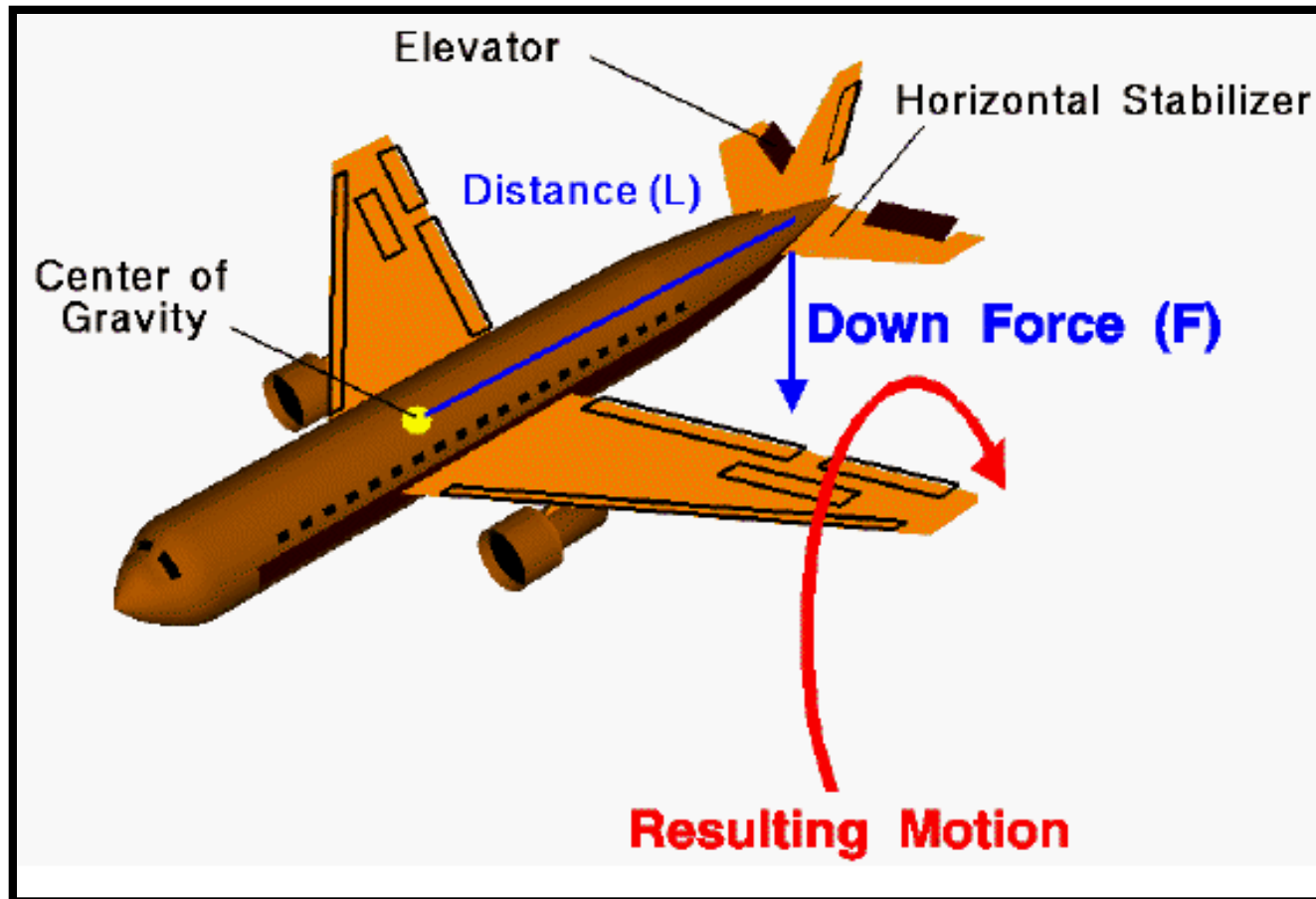
*Elevators are used  
to pitch the aircraft up or down  
causing it to climb or dive.*

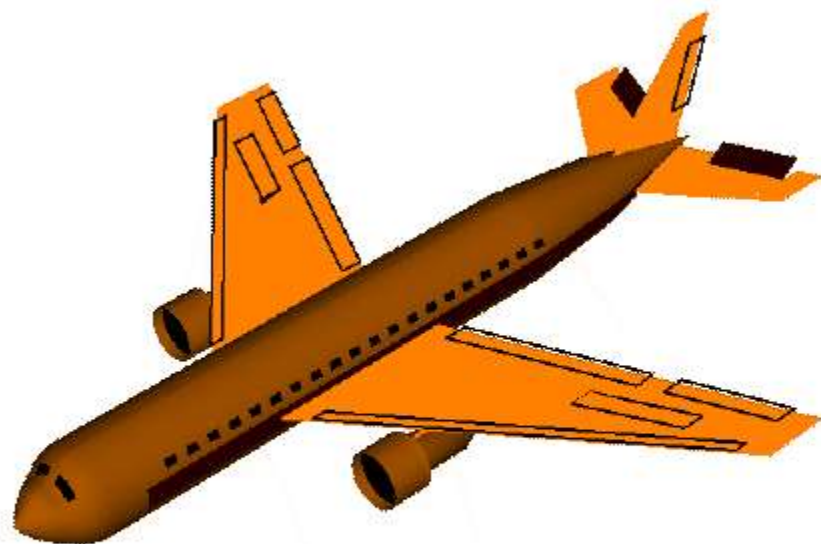


*To climb, the pilot pulls the  
control stick back causing the  
elevators to be deflected up. This*

# ELEVATOR

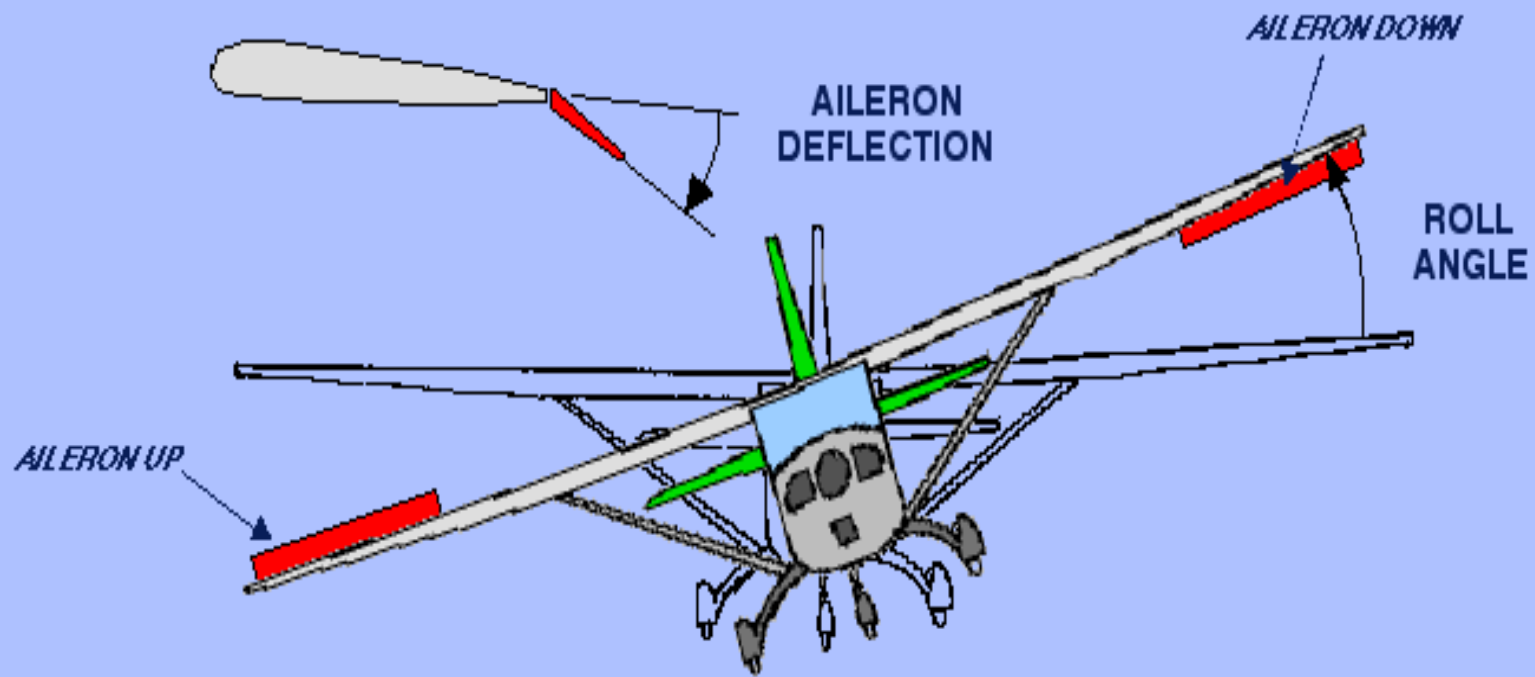
- **Lateral axis** extends crosswise from wingtip through wingtip. Movement about the lateral axis is called pitch. **Pitch is controlled by the elevator.**





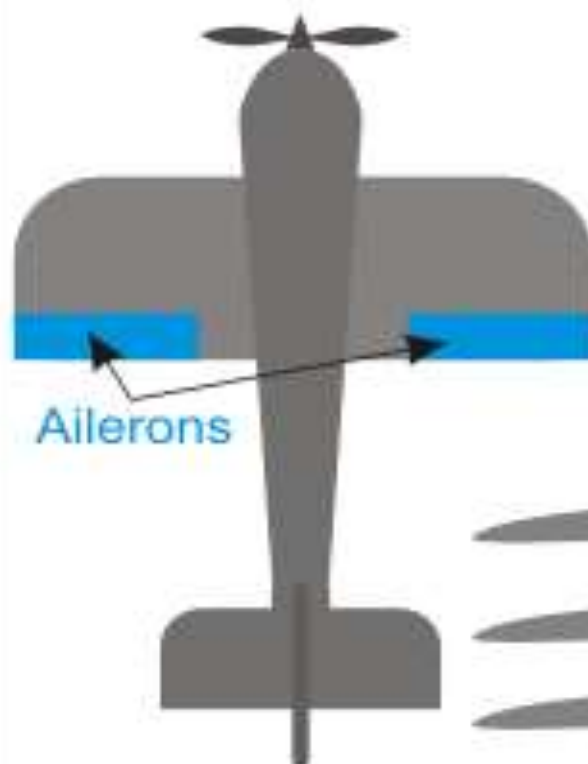
# The Ailerons Control the Roll Angle

Ailerons are used to roll or rotate the aircraft .

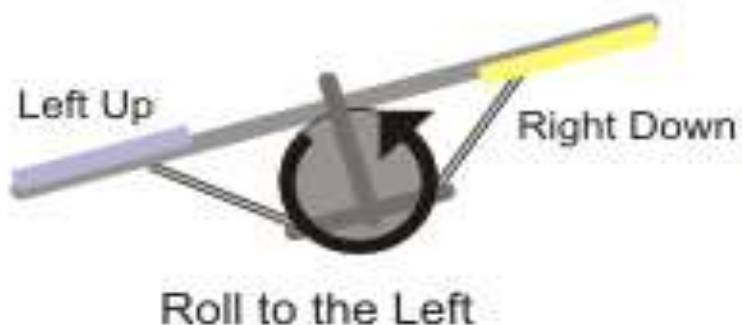
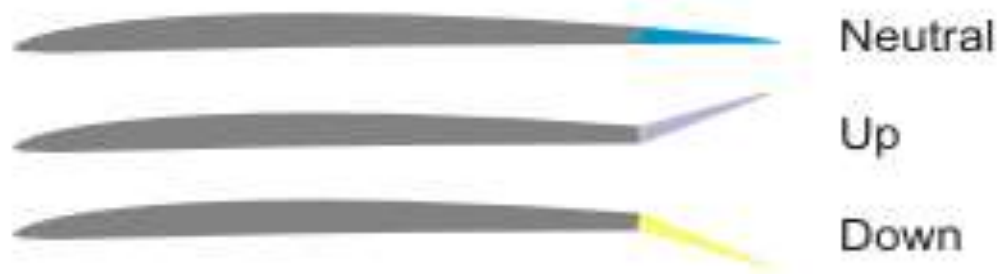




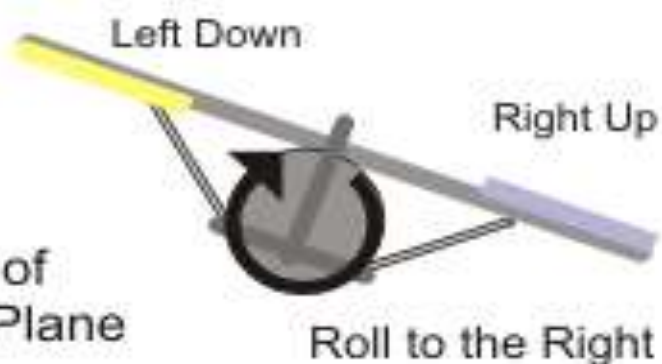
# Ailerons



## Side View Wing / Aileron



## View of Back of Plane



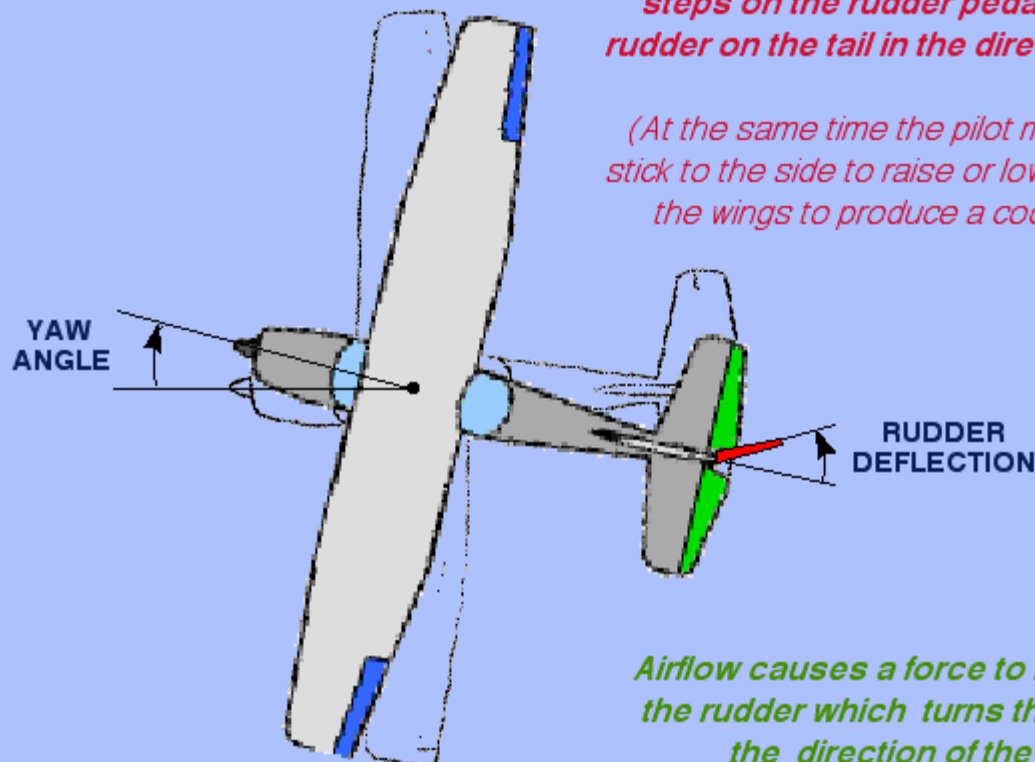


# The Rudder Controls the Yaw Angle

*The rudder turns the aircraft right or left, this is called yawing*

*To yaw right or left, the pilot steps on the rudder pedals to swivel the rudder on the tail in the direction of the turn.*

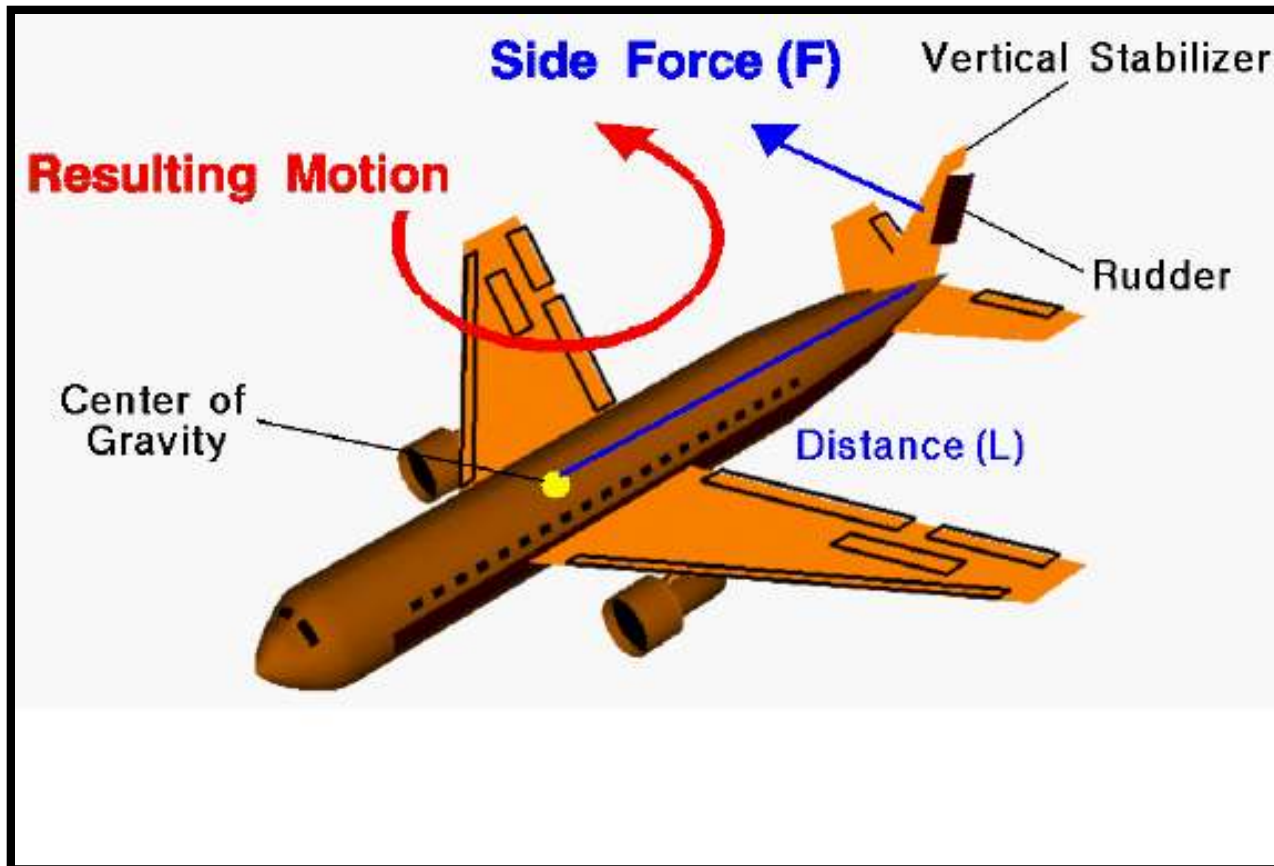
*(At the same time the pilot moves the control stick to the side to raise or lower the ailerons on the wings to produce a coordinated turn.)*



*Airflow causes a force to be applied to the rudder which turns the aircraft in the direction of the force.*

# RUDDER

- **Vertical axis** passes vertically through the center of gravity (when the aircraft is in level flight). Movement about the vertical axis is called yaw. **Yaw is controlled by the rudder.**





# Fly-by-wire control systems

- The movements of flight controls are converted to electronic signals transmitted by wires (hence the fly-by-wire term)
- Flight control computers determine how to move the [actuators](#) at each control surface to provide the expected response
- Electronics for aircraft flight control systems are part of the field known as [avionics](#)

# Fly By Optics

- The movements of flight controls are converted to electronic signals transmitted by fiber optic cables (also known as fly-by-light)

# Variant Flight Control Surfaces

- V-tail Ruddervator
- Flaperons
- Elevons



# Control Surfaces

