

Parts of an Airplane

Concepts Illustrated:

- Various aviation knowledge and trivia
- Identification of the basic parts of a plane.

Time Requirements: 60 Minutes

Grade Level of Audience: This activity is primarily suited for kids in grades 3-6.

Parts of an Airplane

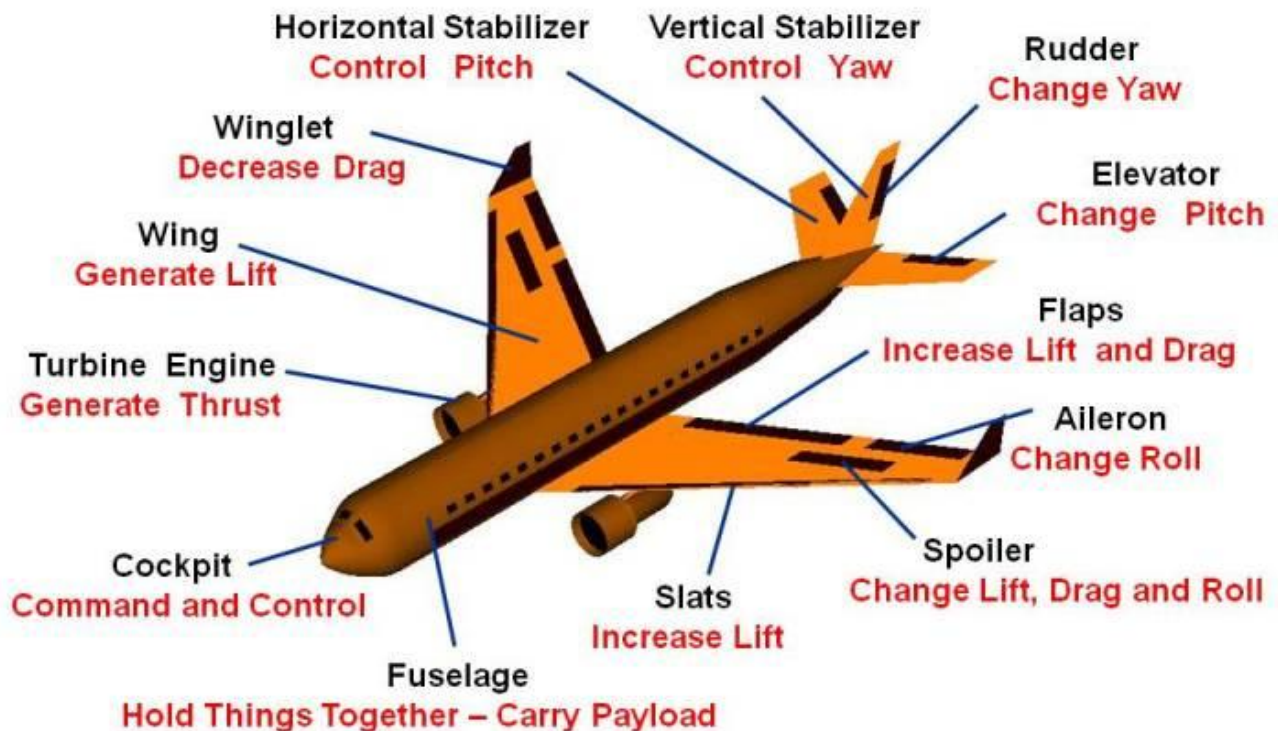
Adapted for the EAA from Glenn Learning Technologies, LTP

Beginner's Guide to Aerodynamics is a "textbook" of information prepared at NASA Glenn Research Center to help you better understand how airplanes work. Reference the diagram below, **Airplane Parts and Function**. Study the labeled diagram and read the explanation of the functions of the airplane parts. Then using the information shown at Airplane Parts Identification and Functions Problems, complete the questions.

National Aeronautics and Space Administration



Airplane Parts and Function



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This page shows the parts of an airplane and their functions. Airplanes are transportation devices which are designed to [move](#) people and cargo from one place to another. Airplanes come in many [different](#) shapes and sizes depending on the mission of the aircraft. The airplane shown on this slide is a turbine-powered airliner which has been chosen as a representative aircraft.

For any airplane to fly, one must lift the [weight](#) of the airplane itself, the fuel, the passengers, and the cargo. The [wings](#) generate most of the [lift](#) to hold the plane in the air. To generate lift, the airplane must be pushed through the air. The air resists the motion in the form of aerodynamic [drag](#). Modern airliners use [winglets](#) on the tips of the wings to reduce drag. The [turbine engines](#), which are located beneath the wings, provide the [thrust](#) to overcome drag and push the airplane forward through the air. Smaller, low-speed airplanes use [propellers](#) for the [propulsion system](#) instead of turbine engines.

To [control](#) and maneuver the aircraft, smaller wings are located at the tail of the plane. The tail usually has a fixed horizontal piece, called the horizontal stabilizer, and a fixed vertical piece, called the vertical stabilizer. The stabilizers' job is to provide stability for the aircraft, to keep it flying straight. The **vertical stabilizer** keeps the nose of the plane from swinging from side to side, which is called [yaw](#). The **horizontal stabilizer** prevents an up-and-down motion of the nose, which is called [pitch](#). (On the Wright brother's first aircraft, the horizontal [stabilizer](#) was placed in front of the wings. Such a configuration is called a **canard** after the French word for "duck").

At the rear of the wings and stabilizers are small moving sections that are attached to the fixed sections by hinges. In the figure, these moving sections are colored brown. [Changing the rear portion](#) of a wing will change the amount of force that the wing produces. The ability to change forces gives us a means of controlling and maneuvering the airplane. The hinged part of the vertical stabilizer is called the [rudder](#); it is used to deflect the tail to the left and right as viewed from the front of the fuselage. The hinged part of the horizontal stabilizer is called the [elevator](#); it is used to deflect the tail up and down. The outboard hinged part of the wing is called the [aileron](#); it is used to [roll](#) the wings from side to side. Most airliners can also be rolled from side to side by using the [spoilers](#). Spoilers are small plates that are used to disrupt the flow over the wing and to change the amount of force by decreasing the lift when the spoiler is deployed.

The wings have additional hinged, rear sections near the body that are called [flaps](#). Flaps are deployed downward on takeoff and landing to increase the amount of force produced by the wing. On some aircraft, the front part of the wing will also deflect. **Slats** are used at takeoff and landing to produce additional force. The [spoilers](#) are also used during landing to slow the plane down and to counteract the flaps when the aircraft is on the ground. The next time you fly on an airplane, notice how the wing shape changes during takeoff and landing.

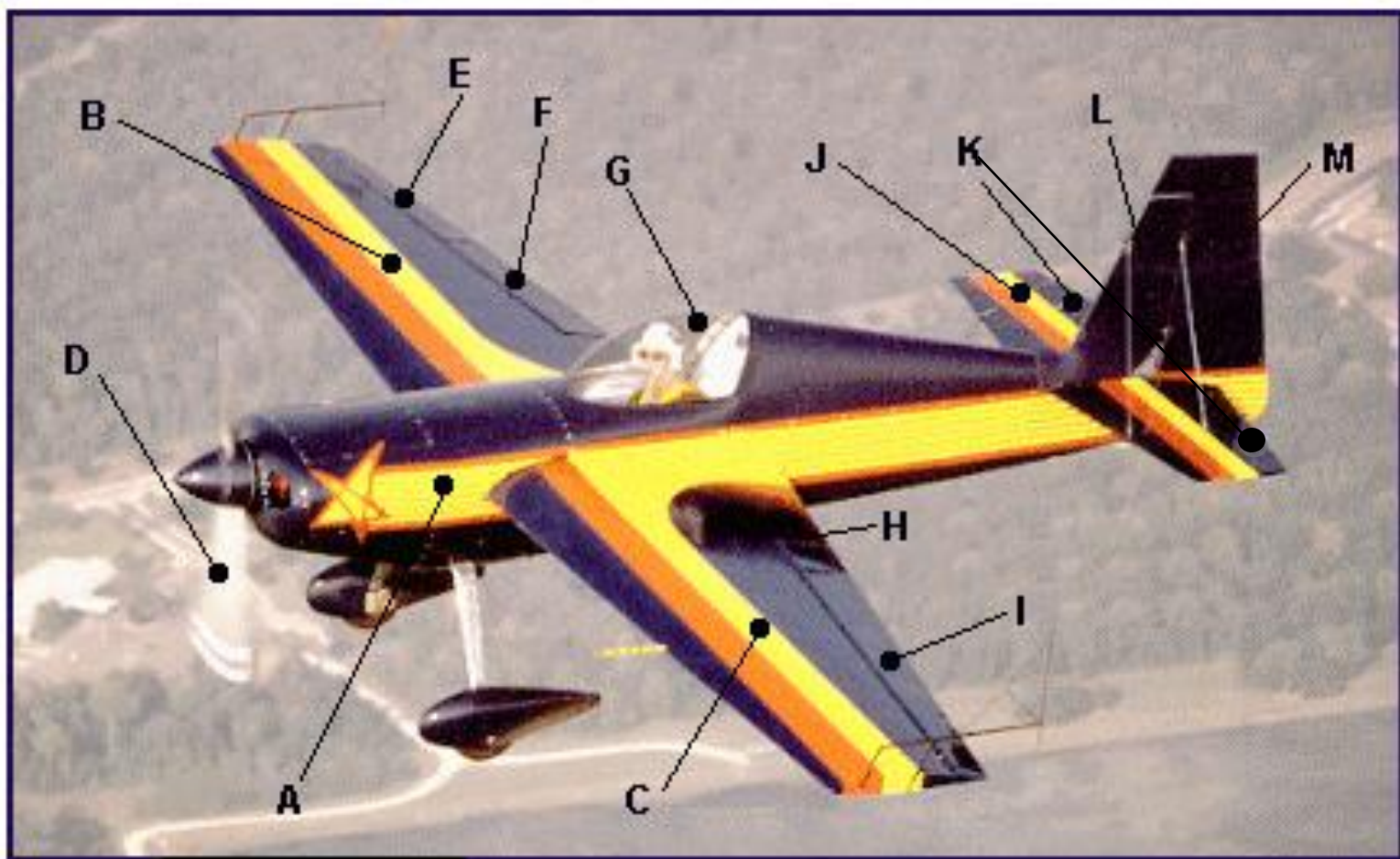
The [fuselage](#) or body of the airplane, holds all the pieces together. The pilots sit in the **cockpit** at the front of the fuselage. Passengers and cargo are carried in the rear of the fuselage. Some aircraft carry fuel in the fuselage; others carry the fuel in the wings

PRINT THIS ANSWER SHEET TO FILL OUT AND TURN IN.

NAME _____

CLASS _____ DATE _____

Airplane Parts Identification & Functions Worksheet



- Using the letters shown on the airplane photograph above, identify the airplane parts listed below. Write both correct letters where needed.



Answer Sheet

1. Wings _____
2. Vertical stabilizer _____
3. Fuselage _____
4. Flaps _____
5. Cockpit _____
6. Propeller _____
7. Rudder _____
8. Ailerons _____
9. Elevator _____
10. Horizontal stabilizer _____

1. Write the names of the three airplane parts that can be used to change the shape of the wings.

1. _____

2. _____

3. _____

2. The wing generates lift because of its shape. Look at the airplane above. Which other part of the airplane, because of its similar shape, should also generate lift?

3. Look at the airplane above. Which moveable part would the pilot use to make the airplane turn to the left?

4. Which part would the pilot move in order to tip the left wing lower than the right?

5. Which part of the airplane in the picture above is generating thrust?
