

Air and Aerodynamics

Quiz #2

True or False. Circle T if the statement is correct or F if the statement is incorrect. (1 mark each)

1. **T** **F** The feathers on birds most important for flight are called contour feathers
2. **T** **F** If thrust is greater than drag, the object slows down.
3. **T** **F** Shape affects how objects move through air.

Multiple Choice. Circle the best answer. (1 mark each)

4. **Propulsion is best defined as**
 - a. The force that resists the forward movement of an object
 - b. The force that drives the forward movement of an object**
 - c. The force that resists the lift of an object
 - d. The force that drive the lift of an object
5. **From a height we drop a piece of non-crumpled paper and a crumpled piece of paper. The crumpled piece of paper would hit the ground first because**
 - a. The crumpled piece of paper has a smaller surface area making less drag.**
 - b. The crumpled piece of paper has a smaller surface area making less thrust.
 - c. The non-crumpled piece of paper has a smaller surface area making less drag.
 - d. The non-crumpled piece of paper has a smaller surface area making less thrust.
6. **The pilot explains that the airplane is like a bird in that both are streamlined in order to reduce _____.**
 - a. Lift
 - b. Drag**
 - c. Thrust
 - d. Gravity
7. **In order for a bird or airplane to fly**
 - a. Drag must be equal to lift
 - b. Gravity must equal thrust
 - c. Lift must be greater than gravity**
 - d. Thrust must be greater than drag

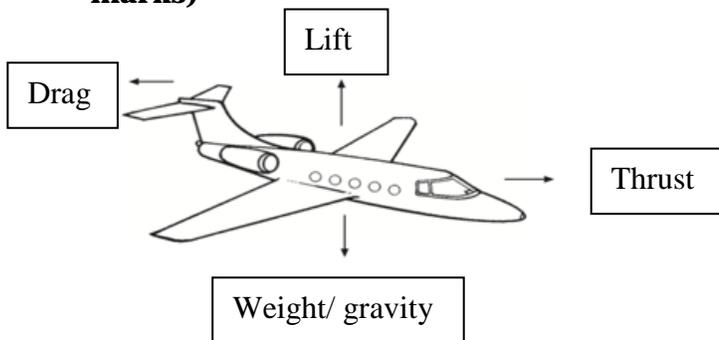


Fill in the Blanks. (1 mark/blank)

8. Powered Flyers use engine or body energy as forms of propulsion.
9. Lift occurs when an object has high pressure on its lower surface than on its upper surface.
10. An airplane's wing is *shaped* to so the top of the wing is curved while the bottom of the wing is flat
11. While a bird is landing the *force* of drag/gravity is greater than thrust/lift

Short Answer. Complete the following questions in written form.

12. Label the four forces of flight on the airplane and explain what each force means. (8 marks)



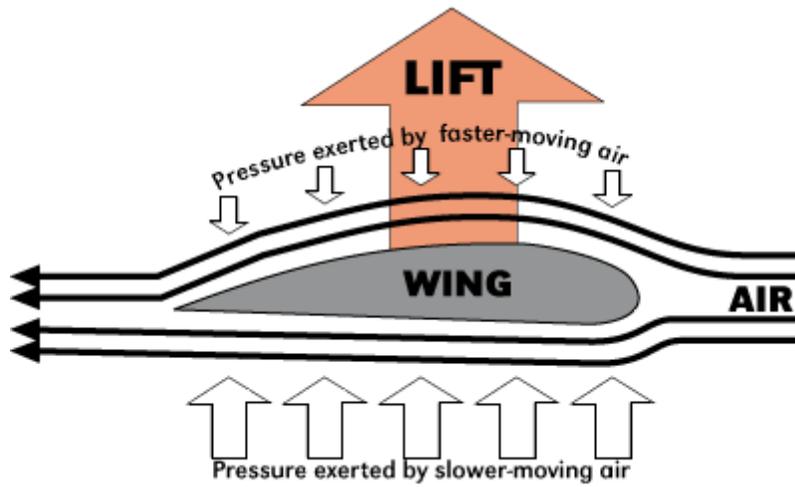
13. Explain why one athlete may want to reduce drag and another athlete may want to increase drag. (2 marks)

- Reduce drag to go faster/ speed up
- Increase drag to slow down (finish line, tight turn)

14. Explain one adaption that helps either a bird or insect fly. Be sure to identify which you have chosen. (1 mark) Answers may vary

- Bird- hollow bones for light weight
- Insects- wings are rigid/ flexible

15. How is Lift created? Describe Bernoulli's Principle to support your answer. (4 marks)



Fast moving air has low pressure (on the top of an object moving through the air)

Slow moving air has high pressure (on the bottom of an object moving through air)