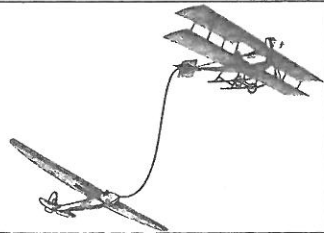


## UNIT TEST—FLIGHT

- When compared to the cooler air around it, the reason why hot air rises is that warmer air
  - lessens drag
  - increases drag
  - is less dense than cooler air
  - is more dense than cooler air
- The pilot of a hot air balloon uses a cord to open a flap at the top of the balloon. When the pilot pulls the cord, some of the warm air in the balloon escapes out the top flap. The pilot does this to cause the balloon to
  - turn around
  - fly straight
  - descend
  - ascend

Use the following information to answer the next three questions.

A glider is a lightweight aircraft supported by the dynamic action of air against its surfaces. A glider is tethered to an aircraft that takes the glider up into the air. When ready, the glider pilot releases the tether and begins the flight downward. A glider will always finish its flight at a lower altitude than where it began its flight. Other examples of gliders include paper planes, flying squirrels and hang gliders because their wings interact with air currents.



- The thrust for a glider is provided by
  - the wind blowing at the time
  - columns of warm air rising
  - an airplane
  - its wings
- The structure that would make a glider curve upward when it flies is its
  - elevators
  - fuselage
  - ailerons
  - rudder

- To make the glider turn to the right, it is necessary to adjust the
  - elevators
  - fuselage
  - ailerons
  - rudder



- The rudder of an airplane is located on its
  - fuselage
  - vertical stabilizer
  - horizontal stabilizer
  - right and left ailerons
- When the rudder is angled right
  - it lessens drag on the right side
  - it creates drag on the right side
  - the plane banks left
  - the plane yaws left
- In order to make an airplane roll to the left and then to the right as it flies, it is necessary to adjust its
  - elevators
  - fuselage
  - ailerons
  - rudder
- The upright fin located at the tail of a plane is called the
  - horizontal stabilizer
  - vertical stabilizer
  - elevator
  - rudder
- Jets achieve forward motion because
  - propellers push air backwards
  - their streamlined shape cuts through the air
  - hot gases are forced out from the rear of the plane
  - hot gases are forced out from the front of the plane

11. Spacecraft achieve lift by
- using the airfoil shape on the body of the rockets
  - first generating lift, then thrust
  - first generating thrust, then lift
  - using large rocket boosters
12. Spacecraft do not need to be streamlined because
- the rockets are streamlined enough
  - spacecraft do not travel quickly in space
  - there is no air in space, therefore there is no drag
  - the equipment needed on the spacecraft makes streamlining too difficult
13. If a space shuttle pilot wanted to increase the speed of the shuttle moving forward in space, the pilot would
- raise the nose of the shuttle
  - release gases from the back of the shuttle
  - lower the outer elevators to decrease drag
  - release gases from the both back and the front of the shuttle

*Use the following information to answer the next question.*

Kira set up an experiment with two parachutes that were the same size and shape but had different-sized holes at the top of the canopy. She predicted that there would be a difference in how fast each parachute fell.



14. In the experiment described, a controlled variable would be the
- time it takes each parachute to reach the ground
  - size of the hole at the top of each parachute
  - colour of the shroud lines of each parachute
  - height from which each parachute falls

*Use the following information to answer the next question.*

Susan builds a launch pad for a glider. The launch pad consists of a rubber band slingshot on a track. Susan hooks the glider to the rubber band and pulls the glider back 2 cm. She then releases the glider and measures how far it travels. Susan performs three more trials, stretching the rubber band back 3 cm, 4 cm, and finally 5 cm.



15. The hypothesis that Susan was likely trying to test was that how far her glider will travel depends on the
- distance the rubber band is stretched
  - slant at which the track is set
  - surface of the track
  - mass of the glide