

# Energy & Forces 5

## Unit Study Guide

My unit test will be on: \_\_\_\_\_

The questions below provide a guide for focusing your studying. You should be familiar with all the topics we covered (see your notes and work) and the vocabulary you studied during this unit. The unit test will consist of matching definitions to vocabulary, multiple choice, fill in the blanks (including labelling diagrams), and short answer.

1. How are buoyant force and weight related to floating and sinking?

Buoyant force is an upward force exerted by a fluid that opposes the weight of anything placed in the fluid. If the buoyant force of the fluid is greater than the weight of an object, the object will float. If the buoyant force of the fluid is less than the weight of an object, the object will sink.

2. How do thrust and drag affect flight?

Answers will vary. Thrust and drag are opposing forces. Thrust is a force in the direction of movement and drag is the force trying to slow the object down. In order to move forwards, the force of thrust must overcome the force of drag. The forward motion of thrust is what creates air movement over the wing. This air movement over the wing is what results in lift. In airplanes, thrust can be created by propellers or jet engines. In birds, thrust is created by flapping the wings. The shape of the object affects the force of drag. Smaller, rounder objects create less drag. This is why birds and airplanes have a 'streamlined' shape. Their rounded, smooth shape means less drag to overcome. More thrust = higher speed.

3. How do lift and weight affect flight?

Answers will vary. Lift and weight are opposing forces. Lift is an upward force and weight is the downward force of gravity acting on an object. In order to fly, the force of lift must overcome the force of weight. Lift is achieved due to moving air. A bird's wing is shaped in a way that forces the air on top to move faster than the air on the bottom. Faster moving air has lower pressure. This means there is lower pressure above the wing than below. This pressure difference results in lift. More lift = higher altitude.

4. Name three traditional technologies developed by diverse cultures that show understanding of the forces of flight.

Bow and arrow, slingshot, fishing spear.

5. Choose one technology from the question above and explain how it uses the forces of flight.

See 'traditional technologies' answer key or refer to the research students did to complete this activity.