

Lesson #115

Friction and Buoyancy

When two objects come into contact with one another, there is always a certain degree of friction. **Friction** is a force that reduces motion by working against it. Even a very smooth surface - like a skating rink - has some friction, and you would be able to see it at a microscopic level. Other things that cause friction are very easy to see, like speed bumps in a parking lot. Friction is what allows you to stop your bike by applying the brakes. The brakes rub against your bicycle tires, and that slows or stops the motion. Friction always *works against* motion.

Buoyancy is another force; it effects objects that are in fluids, usually water. Buoyant force is the force of water pushing up on an object and keeping it afloat. When a raft is floating on a pond, the raft moves some of the water out of place. The buoyant force of the raft is equal to the weight of the water that is pushed aside by the raft itself. Like friction, buoyant force acts *in opposition* to another force - gravity. If the weight of an object is greater than the weight of the water it displaces, there will not be enough buoyant force, and the object will sink.

- Which **forces** cause the sled to move?
 - gravity and the adult pushing the sled
 - buoyancy and friction
 - friction and velocity
 - the steering bar and gravity



- What **force** allows a sailboat to stay afloat?

buoyancy gravity friction wind

- Which of these is a mixture of two or more gases?

soda pop humus air petroleum

- The innermost layer of the Earth is called the _____.

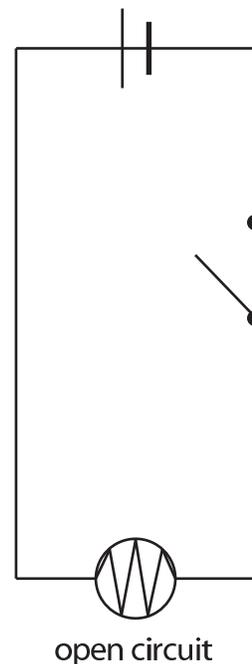
core mantle crust continents

- Which layer of the atmosphere has the lowest density? (See Lesson #50.)

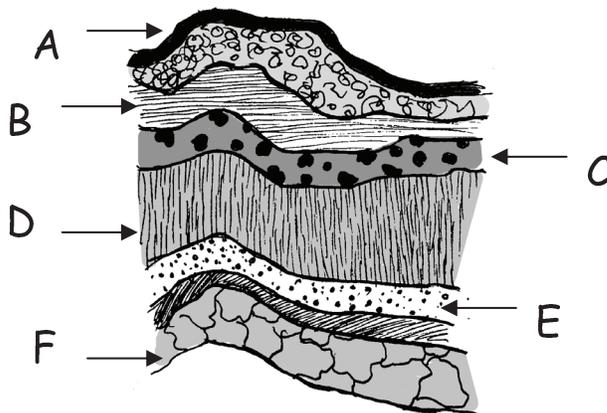
troposphere stratosphere mesosphere thermosphere

6. Look at the diagram of a circuit. What will happen to the bulb in this circuit?

- A) The bulb will light but only for a short time.
- B) The bulb will light, but it will flicker.
- C) The bulb will light and remain lit.
- D) The bulb will not light up.



7. Look at the diagram of the layers of Earth's crust. Which layer would most likely contain the oldest fossils?



8. **True or False?**

- _____ Renewable resources like water may become unusable due to pollution.
- _____ If a forest is completely cut and removed, it will automatically grow back.
- _____ Fish are a renewable resource, so humans can use up as many fish as they want without ever running out.

9. The food you eat combines with oxygen during a chemical reaction that releases heat and energy. What is this chemical reaction called?

- recreation aspiration digestion convection

10. _____ is a measure of average kinetic energy.

- Weight Mass Speed Temperature