

Chapter 13

Use with Section 1

ENRICHMENT**● Newton's First Law****Fluid Friction**

You've already learned that friction is the rubbing force that acts against motion between two touching surfaces. *Fluid friction* is the term used to describe friction between moving fluids or a fluid and a solid. A fluid is any material that flows, so examples include air, water, and oil.

A very simple illustration of fluid friction is an object falling through the air. Another example is a sailboat sailing on a lake—fluid friction from both the air and the water oppose the motion of the object. In general, the less dense the fluid, the less friction it causes.

Oil or other fluid lubricants reduce friction between solid surfaces. That is why they are used to fill spaces between moving machinery parts. The lubricants do their job by allowing the parts of the machine to move more easily and produce less heat. Heat, one of the main effects of the force of friction, can cause severe problems with machinery by making parts that rub against one another wear out faster. This excessive wear can be dangerous as well as costly.

For another example of fluid friction at work, consider a glacier sliding down a mountain. Several forces are at work, but one of them is water. When the ice of a glacier is deep enough, it weighs so much that ice crystals at the glacier's base begin to melt. The water then acts as a fluid between the ice and the mountain beneath the glacier. With this lubrication, the glacier can slide downhill.

Answer the following questions, using complete sentences.

1. Name some examples of fluid friction. Try to include examples using the fluids air, water, and oil.

2. Why do we say that lubricating fluids "control" friction?
