Friction

Objectives

• **Explain** why friction occurs.

• List the two types of friction, and give examples of each type.

 Explain how friction can be both harmful and helpful.

Critical Thinking Time

• When was the last time you fell down? How did it happen?

Suppose you and a younger sister or brother are at a neighborhood pool. Your sister or brother asks why there are signs that say "NO RUNNING." What would be your answer in terms of friction? Where else do you see such cautionary signs?



I. The Source of Friction

A. The Effect of Force on Friction The amount of friction depends on the force pushing the surfaces together.

B. The Effect of Rougher Surfaces on Friction Rough surfaces have more microscopic hills and valleys than smooth surfaces do. So, the rougher the surface is, the greater the friction is.



FRICTION IS A FORCE THAT ACTS IN AN OPPOSITE DIRECTION TO MOVEMENT.

Force and Friction

There is more friction between the book with more weight and the table than there is between the book with less weight and the table. A harder push is needed to move the heavier book.



Turning a book on its edge does not change the amount of friction between the table and the book.



II. Types of Friction

A. Kinetic Friction The word kinetic means "moving." So, kinetic friction is friction between moving surfaces.

B. **Static Friction** When a force is applied to an object but does not cause the object to move, static friction occurs.



III. Friction: Harmful and Helpful

A. Some Ways to Reduce Friction One way to reduce friction is to use lubricants. Friction can also be reduced by switching from sliding kinetic friction to rolling kinetic friction. Another way to reduce friction is to make surfaces that rub against each other smoother.

B. Some Ways to Increase Friction One way to increase friction is to make surfaces rougher. Another way to increase friction is to increase the force pushing the surfaces together.



