



# Friction in Our Lives

## Reading for Information

When you go to gym class, what is best to wear – socks or tennis shoes? You probably said tennis shoes – but why? Well, for one thing, tennis shoes protect your feet from getting hurt during your activities. But the other reason you wear tennis shoes, is because they provide a lot more friction between your feet and the gym floor.

Friction is the force that occurs when two things rub together. It usually slows you down – so with less friction you can move more easily. With more friction, you have to work harder to go the same distance or go the same speed.

Often we think of friction as a bad thing because it slows us down. In many cases, friction is a good thing. Sometimes you want your tennis shoes to grip the floor. Maybe you wear cleats when you play baseball or soccer to help your feet get better traction. If the tires on your car are worn down and don't have enough friction with the road you can end up in the ditch!

However, in some instances we try to decrease friction as much as possible. Cars are a good example. Wheels decrease friction a lot, and race cars have smooth tires to further decrease friction. The tires on our cars need to have enough tread to give us traction in rain and snow. Also cars use oil and ball bearings to reduce friction and make the engine and other moving parts work smoother.

Another way the people try to reduce the force of friction when they travel is by not traveling on the ground. Boats travel with less friction than cars on the highway, but there still is friction between the boat's hull and the water – this is called fluid friction. Boats that can decrease the amount of contact between their hull and the water can go faster because of less friction. Airplanes and helicopters also avoid the friction of traveling across the ground, but there is still friction that occurs when they travel through the air. They also must be able to overcome the force of gravity that constantly tries to pull them back to the ground.

A recent invention that has received a lot of attention is the maglev train, which is short for magnetic levitation. This train uses the concept of magnetic repulsion to hover just over its tracks so there is no friction at all when it travels. Magnets in the track and the train repel each other to keep the train suspended. Inventors have been experimenting with the concept of the maglev train since the 1960's.

Germany is leading the way in development of a maglev train system called the Transrapid System. Other countries are also working on developing maglev trains to be used for public transportation including Japan and the United States. Maryland and California are both working on maglev train projects but the technology is very complicated. However, when in place, the maglev trains will be able to travel up to 300 miles per hour!

There are online plans for building your own mini maglev train – maybe you'd like to look it up and give it a try!