



Where a good grip is needed

You can increase friction by using suitable materials and making surfaces rougher.

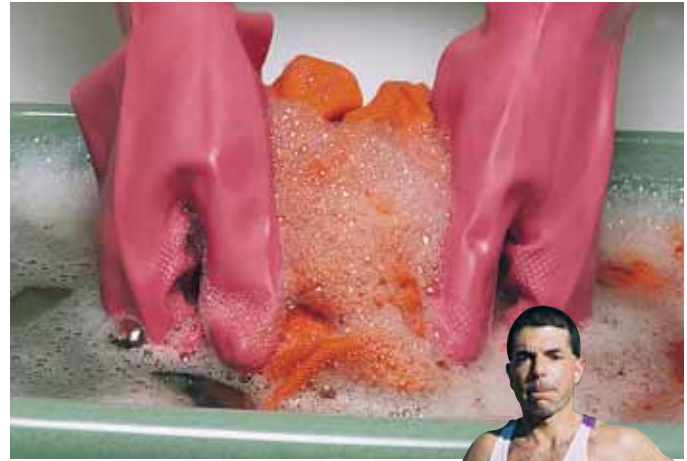
If you try holding soapy dishes, or a bar of wet soap, you will find that they are quite difficult to hold. The dishes and the soap appear far less slippery, however, when you are wearing washing up gloves (Picture 1). Why is this?

When soap is wet, the little troughs in the surface fill with water and become smoother, so the bumps in your fingers can't grip the soap as well. Soap film, or liquid soap, on a dish work the same way.

Why soft is useful

Rubber gloves are made of a very soft material that squashes down into the troughs of the soap even when it is wet, pushing the water out. As a result, it gets a better grip. Soft rubber soles are used on athletic shoes (Picture 2) in part for the same reason: the soles give a good grip. Goalkeepers also have soft rubber surfaces on their gloves.

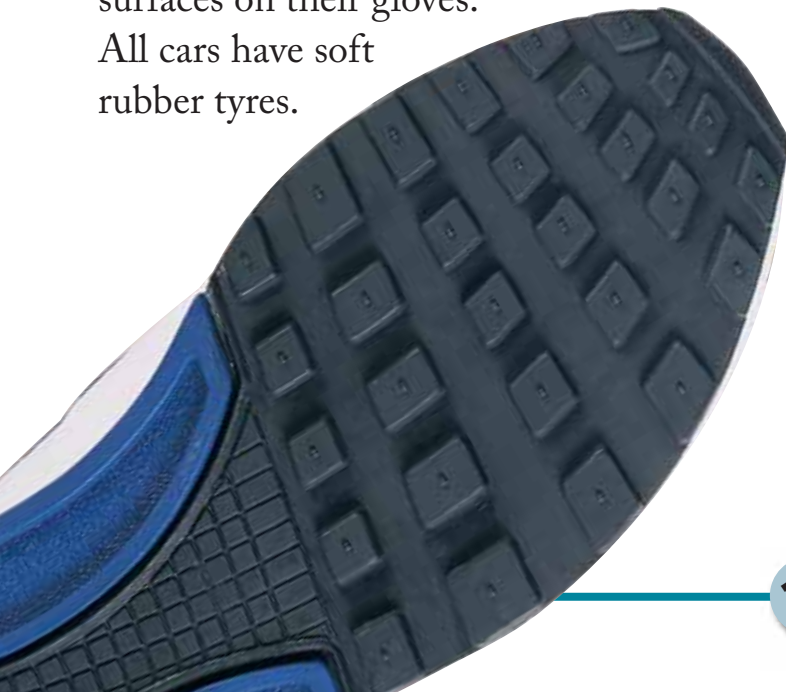
All cars have soft rubber tyres.



▲ (Picture 1) Washing up gloves have a pattern on them to help improve grip.



▼ (Picture 2) Soft soles are best for a good grip on hard surfaces. Notice the gaps in the tread so that water can be squashed out of the way if the surfaces are wet.



A good grip in the wet

Gripping surfaces have patterns cut into them. This is called a **TREAD**.

A tread is used because grip is very different when a surface is wet from when it is dry. When the weather is wet, a flat shoe sole or tyre can easily trap water between itself and the road. This will

► (Picture 3) The tread on tyres provides a place for water to go when the tyres run over a wet road.



cause the shoe or tyre to lose its grip. The tread (Picture 3) makes it easy for water to be squashed out of the way and keeps good grip even in wet weather.

Grip on ice and mud

When one of the surfaces is very slippery, you can get a better grip by making the other surface bite into the slippery one.

In many outdoor sports, for example, players use studded shoes. The studs dig into the soft, slippery ground and give extra grip for running faster.

Snowy and icy weather make roads very slippery. This can be especially dangerous for cars. In this weather, chains may have to be wrapped around tyres (Picture 4). The steel of the chain is harder than the ice so it bites into the ice and gives some grip.



These zig-zag channels make up the tread and allow the water to be pushed out of the way, giving the tread a good grip on wet roads.

If the depth of the tread gets too shallow, the tyre is nearly worn out and there is an increased chance of AQUAPLANING.

► (Picture 4) If a hard material is to have a good grip, it must bite into the slippery surface.



Summary

- For a good grip, both surfaces need to be rough.
- Soft materials can squash down into surfaces to give a better grip.
- Hard materials can bite into slippery surfaces to give a better grip.