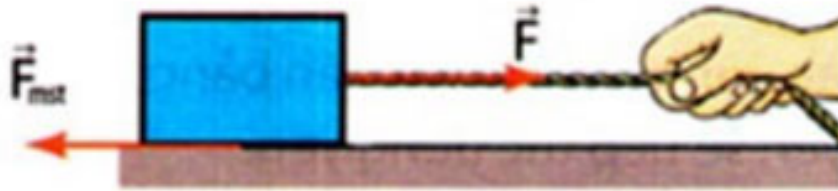


What is friction? How many types of friction are there?

Friction is the force that opposes the motion of an object, created by the objects in contact with it.

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How many types of friction are there?

There are three types of friction:

a) Sliding friction force

1. Sliding friction is generated when one object slides on the surface of another object.
2. Sliding friction always acts in the opposite direction to motion.

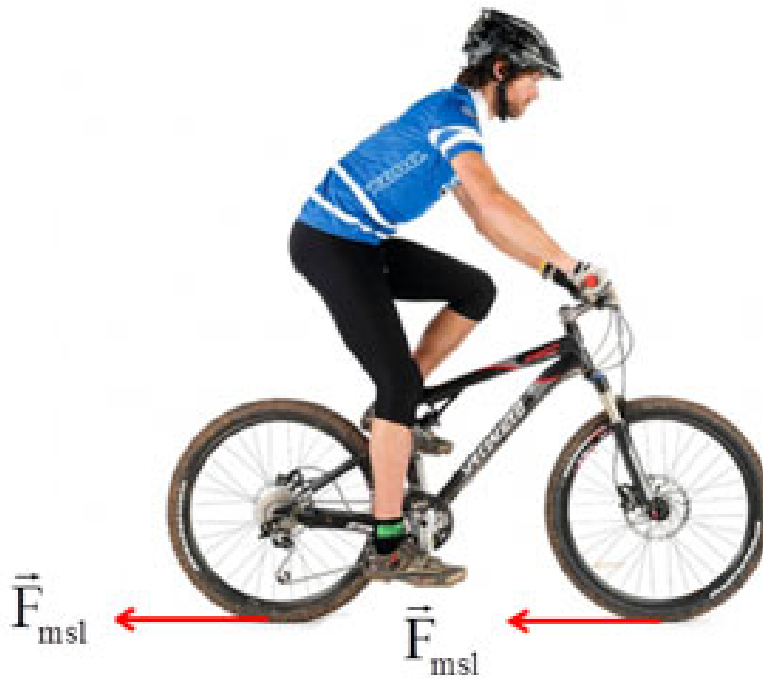
For example, in a violin, when the bow is rubbed against the strings, a sliding friction force is created between them, causing the strings to vibrate and produce sound.



b) Rolling friction force

1. Rolling friction is generated when one object rolls on the surface of another object.
2. Rolling friction is usually very small compared to sliding friction.

For example, rolling friction opposes the movement of objects rolling on a flat surface, such as bicycle wheels.



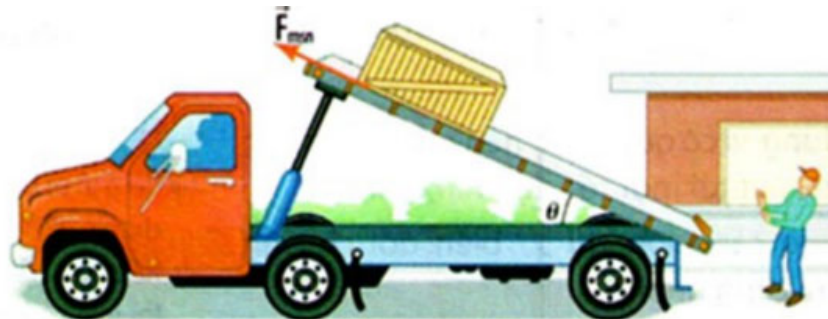
c) Static friction force

- Static friction prevents an object from sliding when subjected to other forces.

- Static friction has the following characteristics:

1. The intensity (magnitude) of a force that tends to cause an object to change its motion varies depending on the force applied to it.
2. It always has the effect of keeping an object in a state of equilibrium when a force is applied to it.

For example: Static friction prevents the cargo container from sliding off the vehicle.



Attention:

1. If an object is at rest and is acted upon by balanced forces, then there is no static friction.

2. If an object is at rest and is subjected to unbalanced forces, then static friction occurs.

Compare sliding friction and rolling friction.

Similarities : Both have the effect of hindering the movement of an object.

Different :

	Sliding friction	Rolling friction
Appears when	An object sliding on the surface of another object.	An object rolling on the surface of another object.
Intensity	Its intensity is greater than the intensity of rolling friction but less than the intensity of static friction.	Its magnitude is less than the magnitude of sliding friction and the magnitude of static friction.

What are the effects of friction in daily life? Give examples.

1. Thanks to static friction, objects are held fixed in space.

Examples: Nails are held in place on walls, screws and bolts are fastened together without coming loose, people can grasp objects, vehicles move on roads, etc.

1. Thanks to rolling or sliding friction, objects stop when they roll or slide.

For example: The brakes on a bicycle, car, or motorcycle help the vehicle stop.

1. Matches are made thanks to sliding friction.
2. Friction between objects generates heat.

For example, indigenous people have used sliding friction to start fires since ancient times.

For example: In winter, rubbing your hands together helps warm them up.

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