

# Lesson 3

Can I explain how friction affects motion?

# Fast Five - answers are on the next slide!

- 1) What is the name of the chart that helps us identify living things?
- 2) Where does the first stage of the digestive system take place?
- 3) What are the three states of matter?
- 4) What temperature is the freezing point of water?
- 5) What part of the water cycle is also known as rain?

# Fast Five - answers are on the next slide!

1) What is the name of the chart that helps us identify living things?

**Classification key**

2) Where does the first stage of the digestive system take place?

**In the mouth**

3) What are the three states of matter?

**Solid, liquid, gas**

4) What temperature is the freezing point of water?

**0 degrees celsius**

5) What part of the water cycle is also known as rain?

**Precipitation**

So what is friction?

# Friction

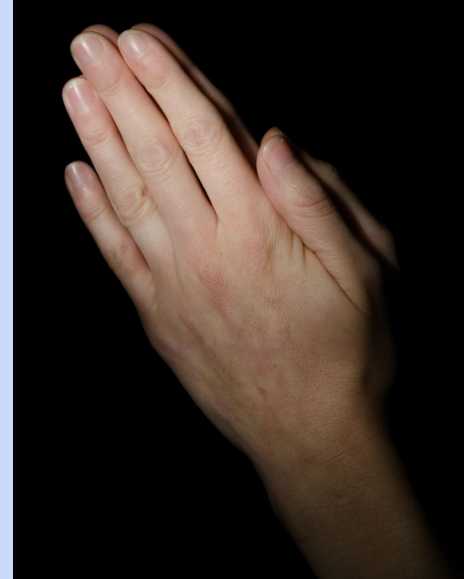


Friction is a force between two surfaces that are sliding, or trying to slide, across each other. Friction always slows a moving object down as it works in the direction opposite from the direction the object is moving, or trying to move.

Friction is a force created when two different surfaces slide against each other.

Friction resists the movement of one surface on another. So if both surfaces are smooth, there will be little resistance.

When we are cold, we rub our hands together to make them warm. The warmth comes from the force of friction, as the surfaces of our hands slide against each other.



# So why is friction important?

Friction is taking place all around us - most of the time we don't even realise it! Even the choice of what item to use or wear is made by the effects that friction might have!

Can you think of a time where friction might be important?



# Socks!

When walking around the house that has smooth flooring, wearing normal socks that also have a smooth surface might end up in us falling over.

There will be little friction between the surface of the floor and the surface of the sock - we know this because smooth surfaces have less friction than rough surfaces!

However, there are slipper socks that have rubber grips along the bottom, and these are there all because of friction.

The rubber grips create lots of friction between the two surfaces and stops us falling over!



Have a look at this picture of a bike. Where might friction occur?





# Have a look at this picture of a bike. Where might friction occur?

Friction between the road surface and the bike's tyres



Friction between their hand and the handlebar.

Friction between the bike pedal and their shoe.

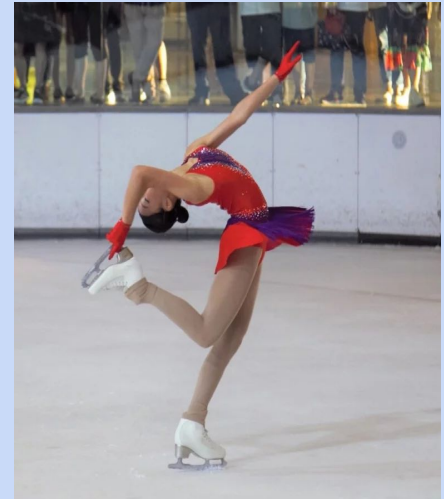
# But what happens when the bike needs to stop?



On the bike's tyres there are brake pads. When the brakes are applied the rubber pad touches the moving wheel. This creates friction between the brake pad and the wheel. The more friction created, the more resistance the wheel will have to try and move. This causes the wheel to come to a stop.

# Friction - advantages and disadvantages

Friction can be an advantage or a disadvantage. Look at the images and decide if friction would be an advantage or disadvantage in the situation.





# Friction - advantages and disadvantages

## Advantage

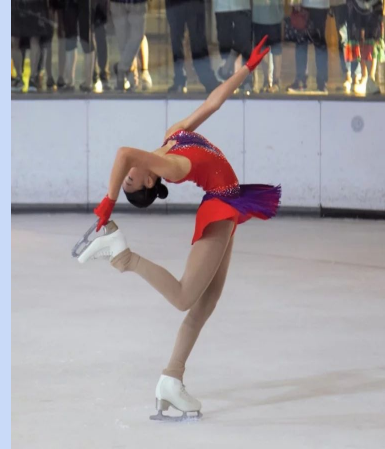


Car tyre - It helps stop the car skidding on the road

Shoes - It helps us stop falling over

Bike brake - It helps bikes stop safely

## Disadvantage



Ice skater - they rely on low friction to glide smoothly along the ice. If there was more friction, it would be harder for them to skate.



Door hinge - if a door hinge is squeaking, the noise is caused by friction. The metal is sliding against each other which, if not treated, could break the hinge.

## Activity (Lesson 3 Work)

Red - Look at the images and decide if friction is an advantage or disadvantage in the situation.

Yellow - Look at the images and decide if friction is an advantage or disadvantage in the situation. Explain why it would be an advantage or disadvantage.

Green - Look at the images and decide if friction is an advantage or disadvantage in the situation and explain why. Think of your own examples and explain if friction would be an advantage or disadvantage.