

MONZA

THE FASTEST F1 LAP IN HISTORY HAPPENED AT MONZA RACE TRACK

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=YQYPU3MNQHW](https://www.youtube.com/watch?v=YQYPU3MNQHW)

Discuss:

What can you think of that makes a car go fast?

What can you think of that slows a car down?

F1 TEAMS HAVE 13 SETS OF TYRES...WHY?

[HTTPS://WWW.FORMULA1.COM/EN/CHAMPIONSHIP/INSIDE-F1/RULES-REGS/TYRES-AND-WHEELS.HTML](https://www.formula1.com/en/championship/inside-f1/rules-regs/tyres-and-wheels.html)

WHAT DO YOU THINK A FORCE IS?

WHAT IS A FORCE?



A force is a push or pull acting on an object as a result of the object's interaction with another object.

Forces make things move. Whenever an object starts to move or moves faster, it is a force making this happen.

Forces can also make things stop moving or slow down.

Click the hockey player to watch a clip showing the effects of forces on different objects.

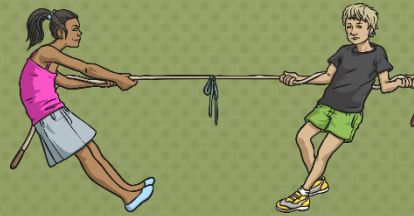
While you are watching, note down any examples of pushes or pulls that you see.

PUSHES AND PULLS

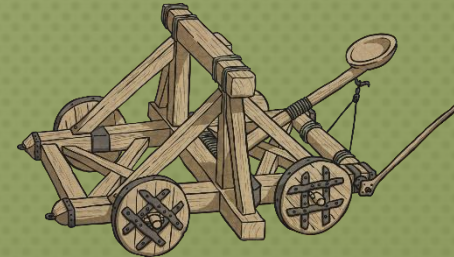
Did you spot these examples of pulling forces?



The rower pulls the oar.

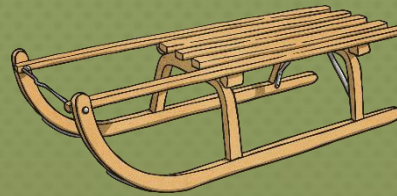


The tug of war teams pull the rope.



A catapult is pulled back.

The string of the bow is pulled back.



Pulling the sledge.



The bell ringers pull the ropes.

PUSHES AND PULLS

Did you notice these examples of pushing forces?

The runner's feet push off the ground.



A person pushes the piano keys down.



The hockey stick pushes the ball.



The golf club pushes the golf ball.



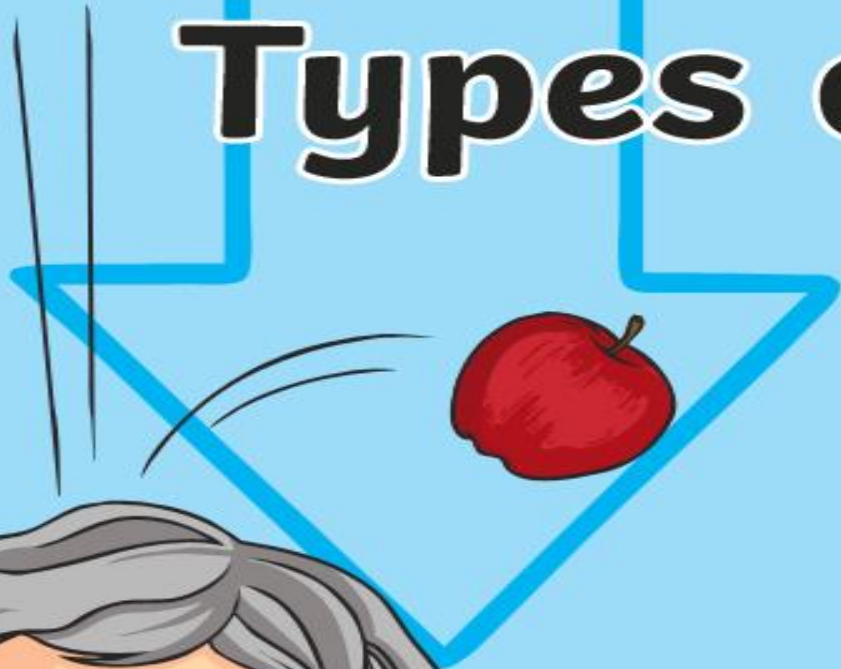
The bat pushes the ball.



The woman pushes the pram.



Types of Forces

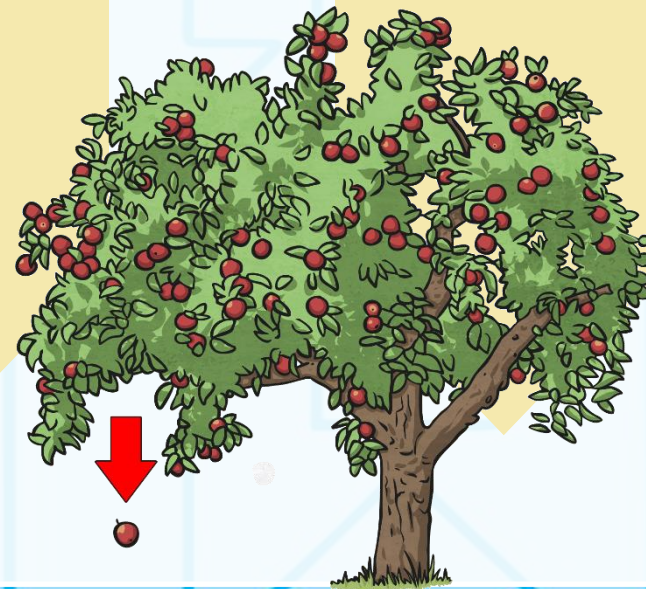


Gravity

Gravity is the force that pulls the Earth and other planets towards the Sun. It also keeps us and other objects on the ground.

We can represent gravity with an arrow pointing down towards the Earth.

Weight is the pull on the mass of an object by the Earth.



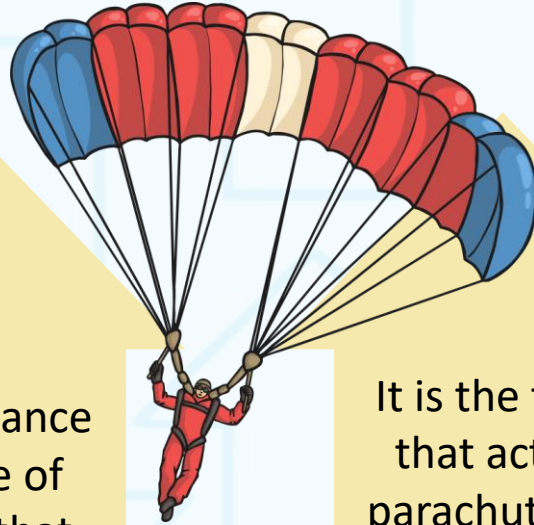
Friction

Friction is a push against a moving object. It happens when there is contact between two materials, like a brake pad on a bicycle tyre.

Friction is the force that stops or slows us when trying to move an object.
If the object is already moving, friction is slowing it down.



Air Resistance



Air Resistance is a type of friction that occurs between the air and another material.

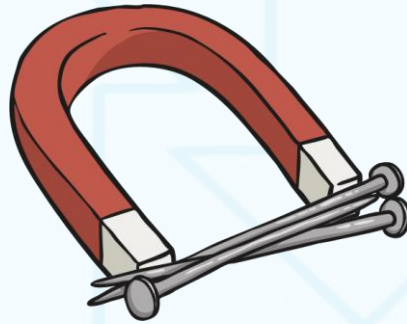
It is the force that acts in parachutes so that we don't crash to the ground.

Upthrust is not a type of friction. It is when the gas or liquid below something pushes up more than the gas or liquid above.

Magnetism

Magnetism is the force that occurs when a magnet pulls a metal object or another magnet towards itself.

Magnetic materials are always metals but only a few metals are magnetic.



Examples of magnetic materials include iron, nickel and cobalt.

Steel is a mixture of metals. It is magnetic because it contains iron.

Buoyancy



Buoyancy (upthrust) is the force that pushes an object upwards in a fluid.

In the water, the weight of an object is pushing down and the upthrust is pushing up. If the weight is equal to or less than the upthrust, the object will float.

If the weight of the object is greater than the upthrust, it will sink.

MODEL WIND TUNNEL TESTING

What do you think they are testing?
What forces might be involved?

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=JYAIXWNOA_A](https://www.youtube.com/watch?v=JYAIXWNOA_A)

INVESTIGATION

MAKING THINGS MOVE

Cyclists sometimes travel over different surfaces.

By pushing the pedals harder or faster, he can change the motion of the bicycle. It will speed up.

When the cyclist pulls on the brakes, the brake pads will push on the wheels, changing the bicycle's motion. It will slow down, and eventually stop.

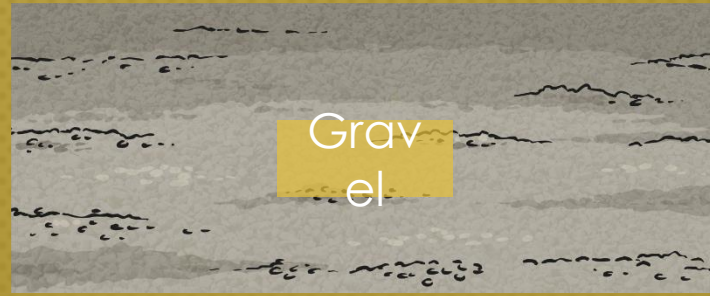


DIFFERENT SURFACES

Cyclists sometimes travel over different surfaces.



Grass



Gravel



Sand



Road

DIFFERENT SURFACES

How do the different surfaces affect the motion of the bicycle?



DIFFERENT SURFACES

These surfaces all exert a force on the bicycle. This force is called friction.

Friction is a force that holds back the movement of an object. Friction acts in the opposite direction to the movement of the object.

The driving force pushes the bicycle, making it move.



Friction pushes on the bicycle, slowing it down.



Grass



Gravel



Sand



Road

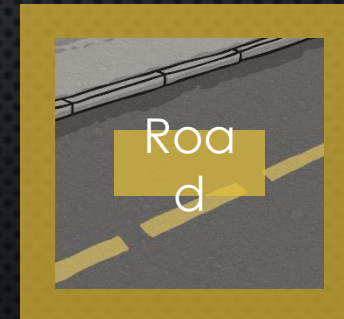
DIFFERENT SURFACES

Different surfaces create different amounts of friction.
The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them.

The driving force pushes the bicycle, making it move.



Friction pushes on the bicycle, slowing it down.



MOVEMENT AND FRICTION

Click the cyclist to watch this clip to watch a group of children investigating the friction created by different surfaces.



Which do you think would move faster?

Why?

What forces might be impacting the speed?



Which do you think would move faster?

Why?

What forces might be impacting the speed?



Which do you think would move faster?

Why?

What forces might be impacting the speed?



Which do you think would move faster?
Why?
What forces might be impacting the speed?



Which do you think would move faster?
Why?
What forces might be impacting the speed?



Which do you think would move faster?

Why?

What forces might be impacting the speed?

