

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 can make objects stop or start moving.

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

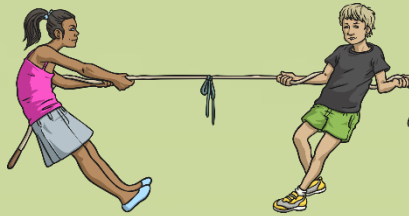
While you are watching, note down any examples of pushes or pulls that you see.

Pushes and Pulls

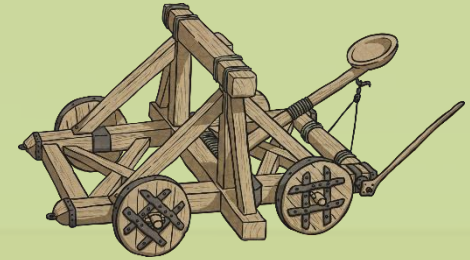
Did you spot these examples of **pulling** forces?



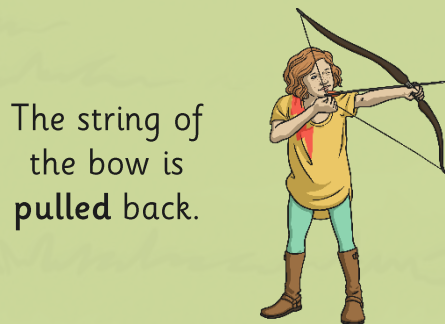
The rower **pulls** the oar.



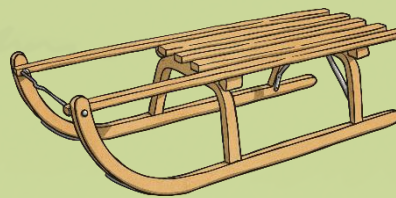
The tug of war teams **pull** the rope.



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.



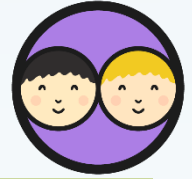
The bat **pushes** the ball.



The woman **pushes** the pram.



Forces in Action

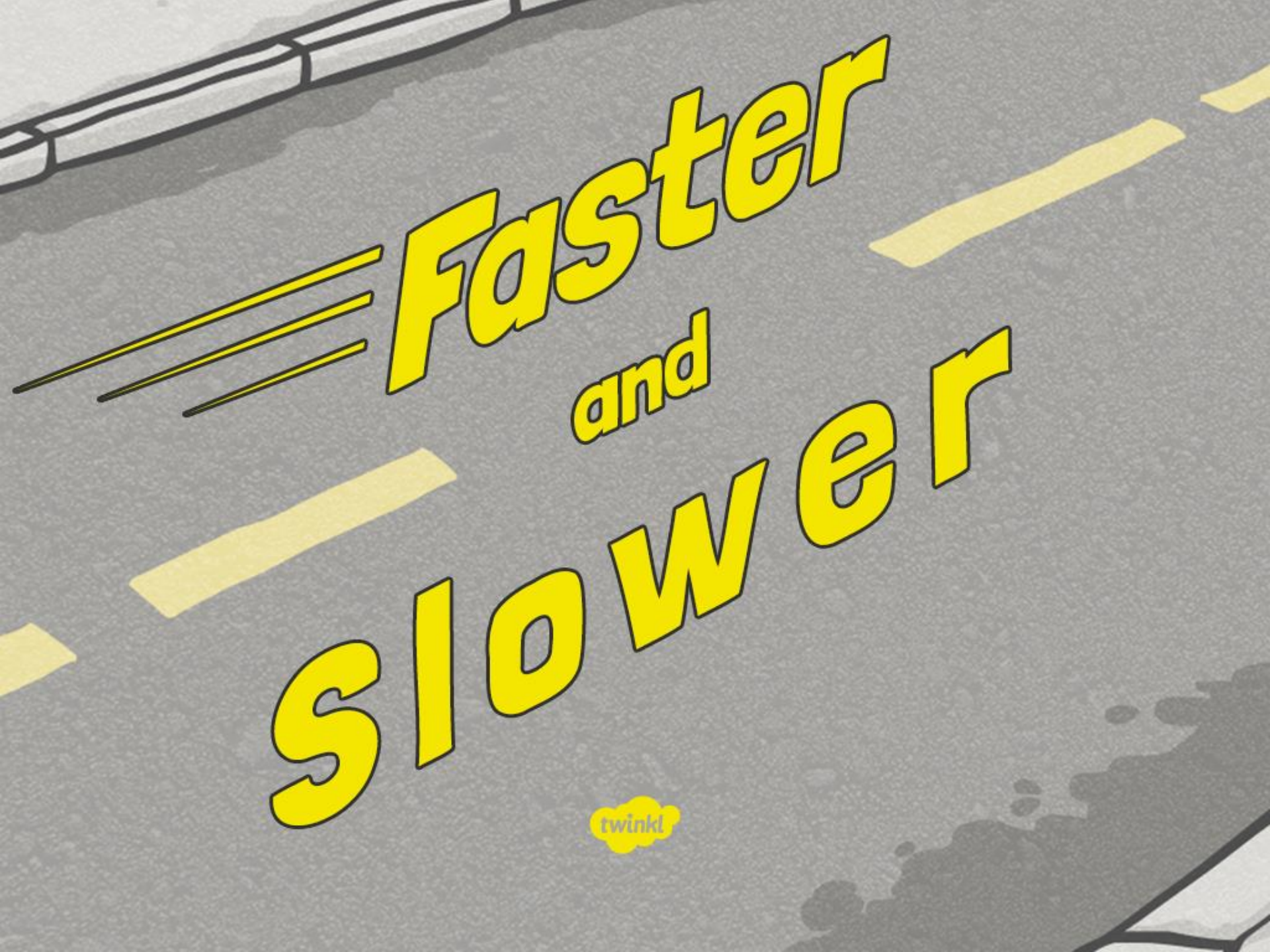


Think of an action that shows how forces move objects. You could choose an action from the clips you watched earlier or think of your own.



Work with a partner to create a freeze frame of the action you have chosen.

Show your freeze frames to the rest of your class. Can your classmates decide if you are demonstrating a pushing force or a pulling force?



Faster

and

slower



Making Things Move

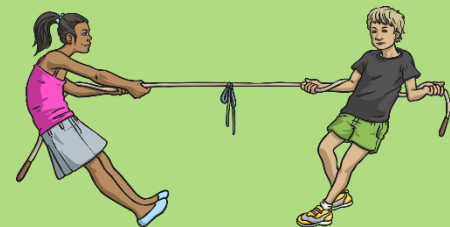
Forces make things move. Whenever an object starts to move or moves faster, it is a force making this happen.

Forces can also make things stop moving or slow down.

But what is a force?

- Forces are pushes and pulls.
- These pushes or pulls will always change the motion of an object. They will either make it start to move or speed up, slow it down or even make it stop.

Talk to your partner about examples of forces changing the motion of different objects.



Making Things Move

Cyclists sometimes travel over different surfaces.

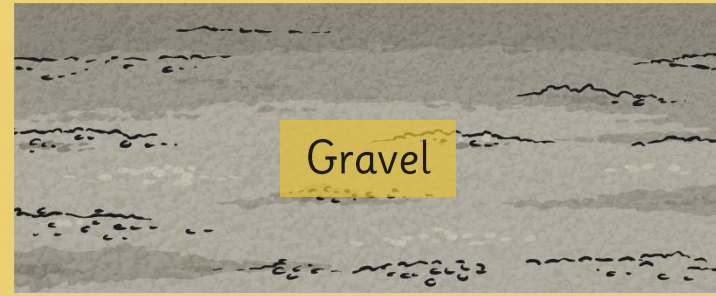
By pushing the pedals harder or faster, he can change the motion of the bicycle. It will speed up.

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.



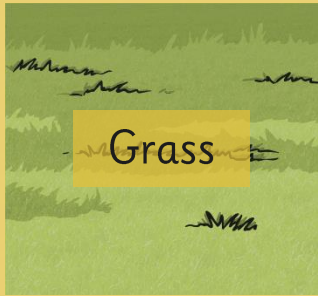
Different Surfaces

Cyclists sometimes travel over different surfaces.

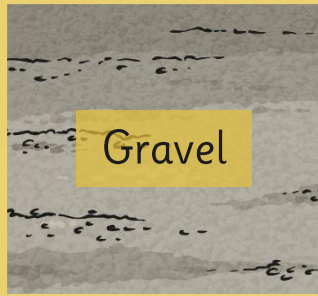


Different Surfaces

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



Grass



Gravel



Sand



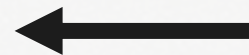
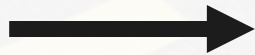
Road



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.

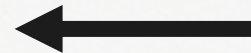
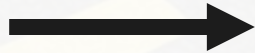


Different Surfaces

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.

