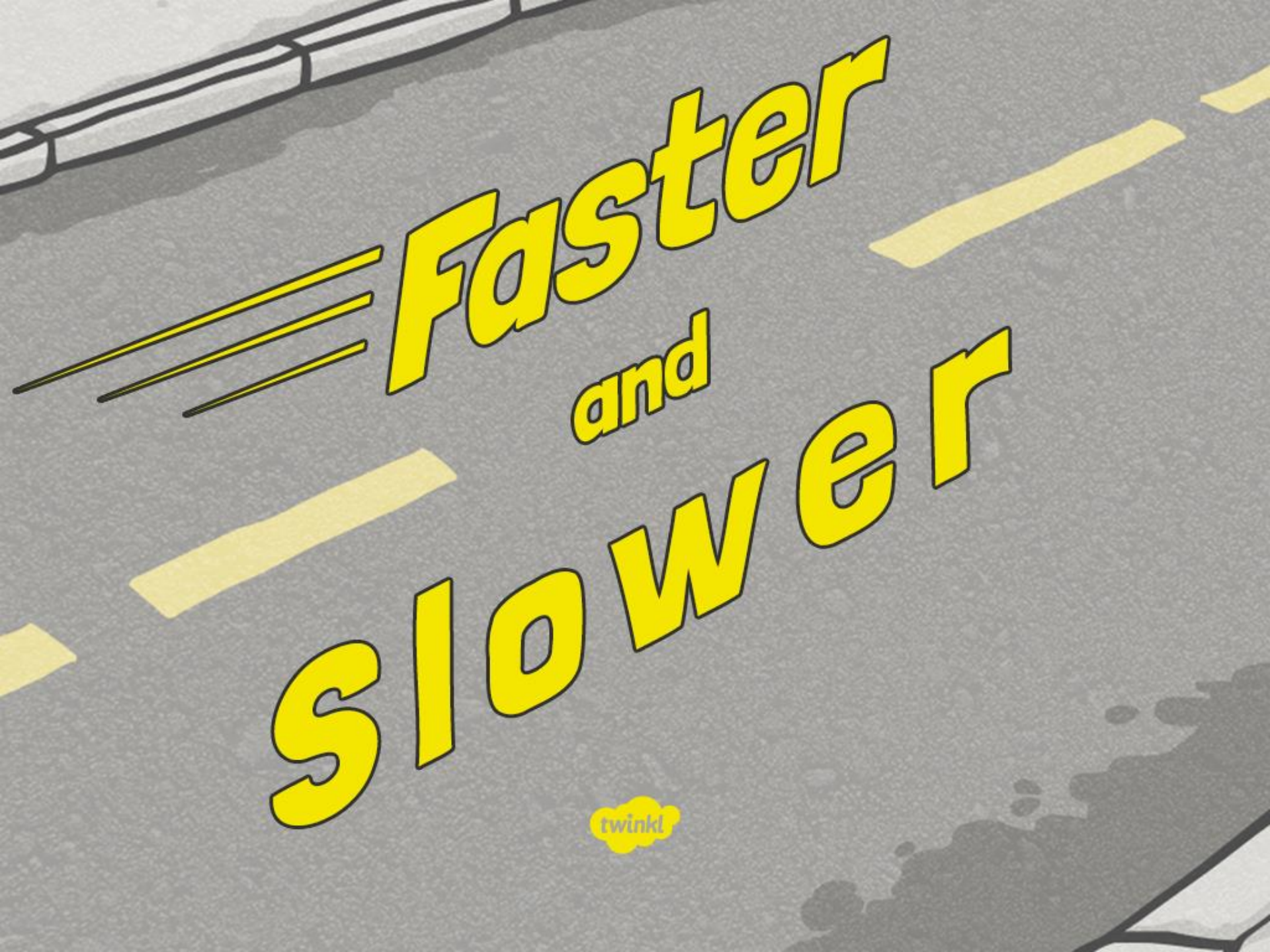

Faster
and
slower
twinkl

Aim

- I can investigate the effects of friction on different surfaces.

Success Criteria

- I can explain the force of friction.
- I can make a prediction about which surface creates the most friction for a toy car.
- I can take measurements and record my results in a table.
- I can explain my results.

Making Things Move

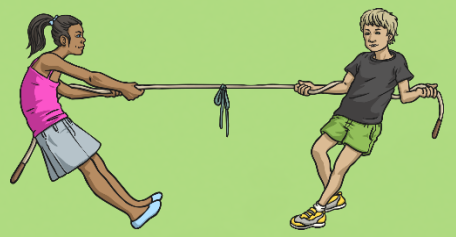
Forces make things move. Whenever an object starts to move or moves faster, it is a force making this happen.
Forces can also make things stop moving or slow down.

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.

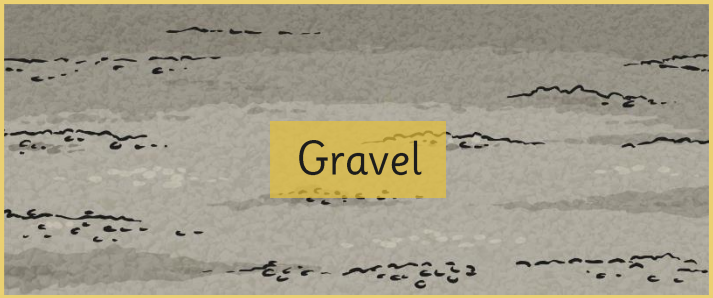
When the cyclist pulls on the brakes, the brake pads will push on the wheels, changing the bicycle's motion. It will slow down, and eventually stop.



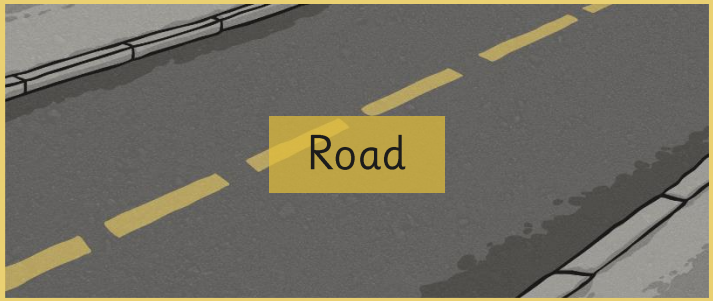
Different Surfaces

Cyclists sometimes travel over different surfaces.



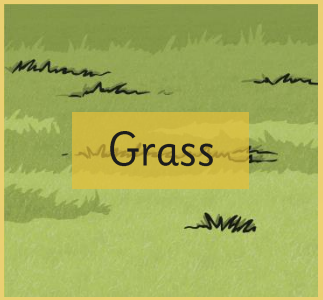






Different Surfaces

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











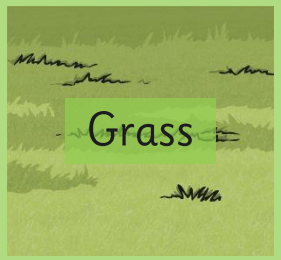
Different Surfaces

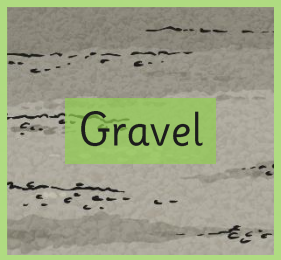
These surfaces all exert a force on the bicycle. This force is called **friction.** Friction is a force that holds back the movement of an object. Friction acts in the opposite direction to the movement of the object.

The driving force pushes the bicycle, making it move.



Friction pushes on the bicycle, slowing it down.









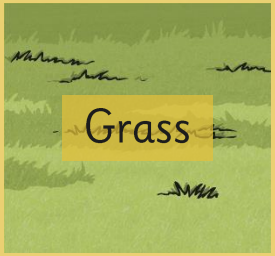
Different Surfaces

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.









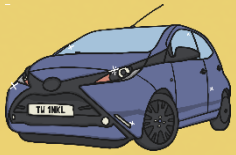
Investigating Friction



You are going to work in groups to set up your own investigation into the amount of friction created by different surfaces.

You will use:

- A toy car

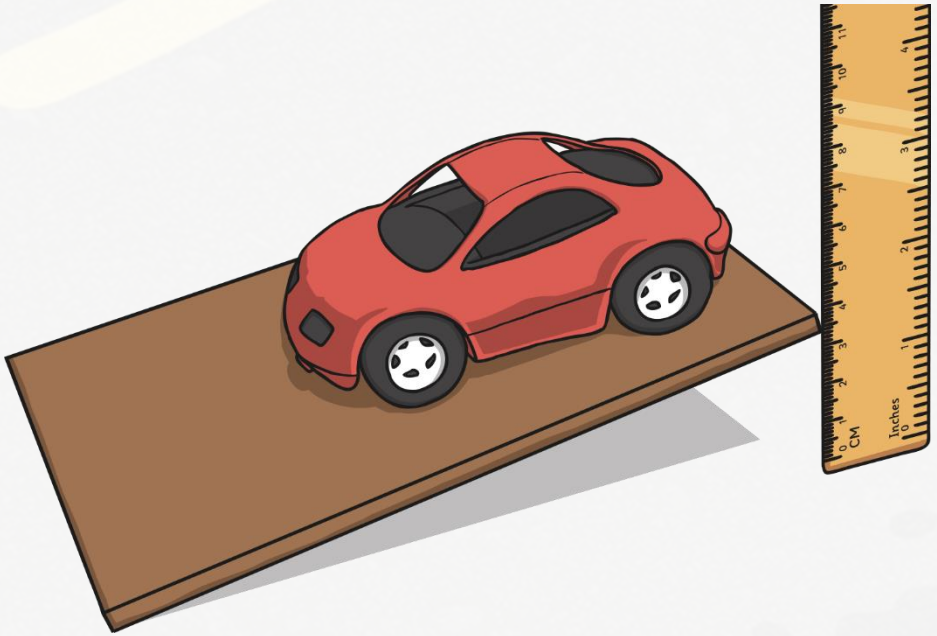


- Boards covered with different surfaces



- A ruler





Investigating Friction



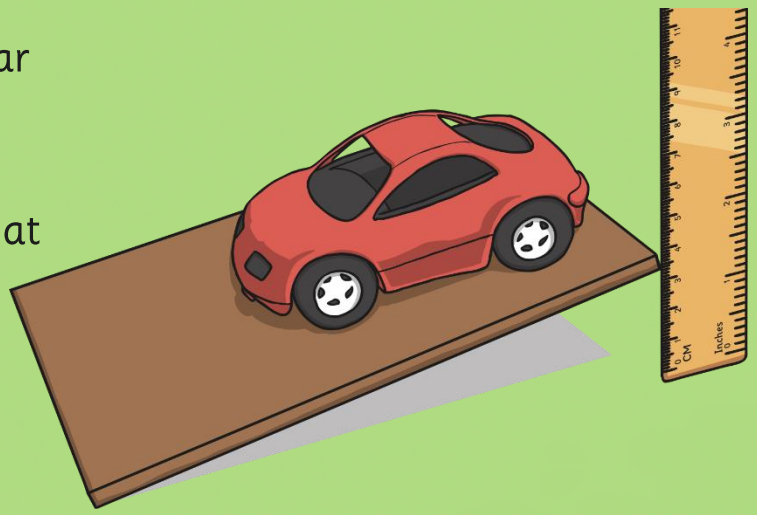
1. Place the car at the end of one of the boards.

2. Place the ruler at the side of the board, so you can measure the height of the board as you lift the end.

3. Lift the end of the board that the car is on 1 cm at a time.

4. Watch the car carefully, and notice at what height it starts to move.

5. Try this with each of the boards covered with different surfaces.



Investigating Friction

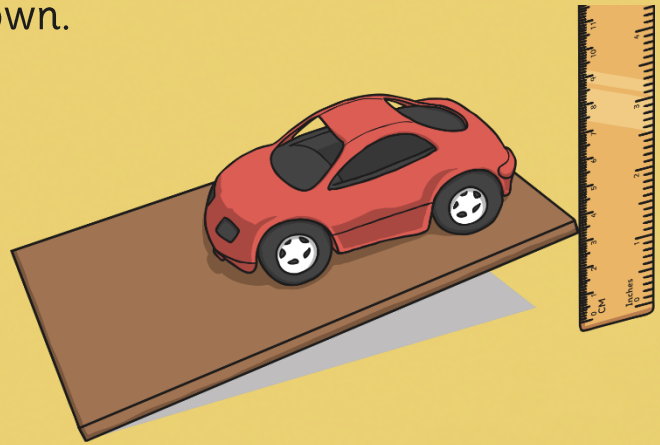


As you lift the ramp, **gravity** will pull the car down.

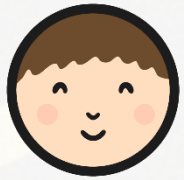
Friction will be pushing opposite to this.

Surfaces that create a lot of friction will need to be lifted higher for gravity to overcome the friction and pull the car down the ramp.

Surfaces that don't create much friction will not need to be lifted much, as it will be easier for gravity to pull the car down.



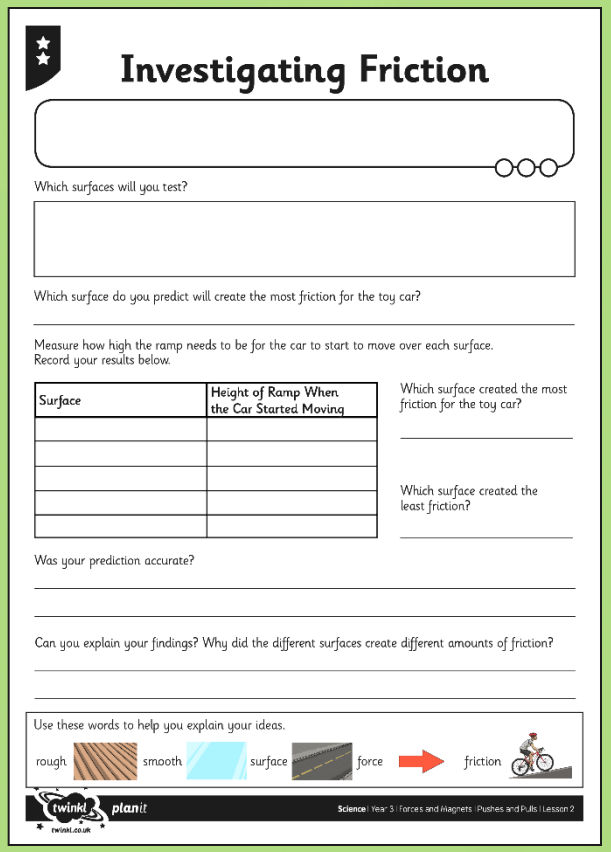
Investigate!



Fill in your Investigating Friction Activity Sheet to predict which surface you think will create the most friction.

Record your results in the table.

Use your results to come up with a conclusion about the surface that created the most friction. **Can you explain your results?**



Investigating Friction

Which surfaces will you test?

Which surface do you predict will create the most friction for the toy car?

Measure how high the ramp needs to be for the car to start to move over each surface.
Record your results below.

Surface	Height of Ramp When the Car Started Moving

Which surface created the most friction for the toy car?

Which surface created the least friction?

Was your prediction accurate?

Can you explain your findings? Why did the different surfaces create different amounts of friction?

Use these words to help you explain your ideas.

rough smooth surface force friction

Friction Findings

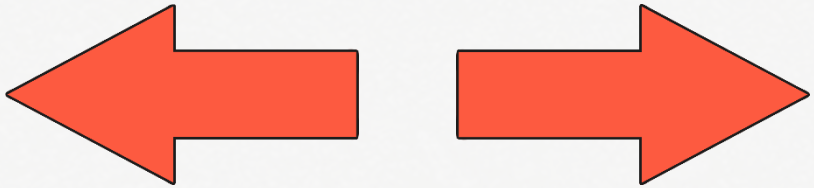


What did you discover?

Which surface created the most friction?

Which surface created the least friction?

Was your prediction accurate?



Aim



- I can investigate the effects of friction on different surfaces.

Success Criteria

- I can explain the force of friction.
- I can make a prediction about which surface creates the most friction for a toy car.
- I can take measurements and record my results in a table.
- I can explain my results.

