



Resistance and Friction

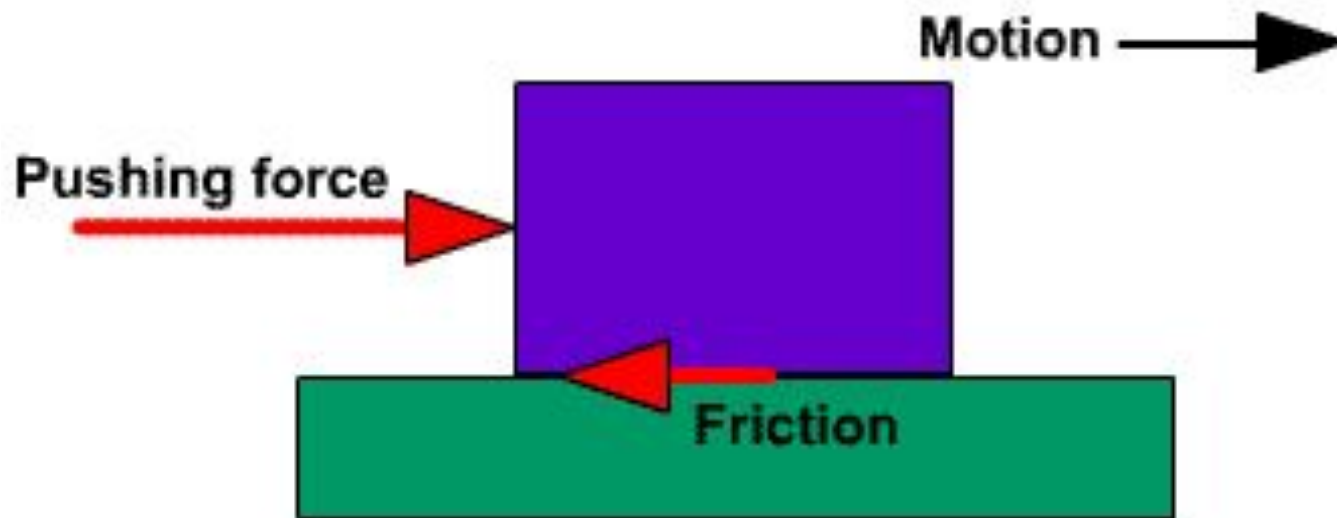
What do they mean?

Can you find the common meaning behind these warning signs?



What is friction?

Why is friction important when creating vehicles?



Keywords

Match or define keywords in your workbook

- Friction
- Force
- Rover
- Resistance



Checks for understanding

1. What is unhelpful friction?

- A. Friction caused between a tyre and the road*
- B. Friction caused when we don't want it*
- C. Friction caused when walking*

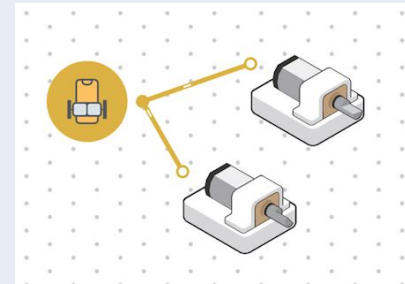
2. In your workbooks can you identify from the images which are 'Helpful Friction' and which are 'Unhelpful friction'

Worked Example

Step 1. Turn on and pair 2 DC Motor blocks.



Step 2. Drag 2 DC Motor blocks and a Car Controller block onto the Workspace and connect them together.

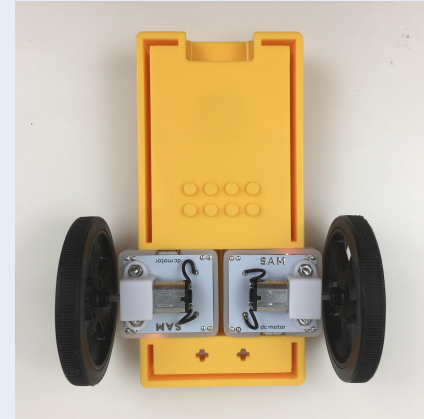


Step 3. Connect the 2 Wheels to the DC Motors and insert into the Yellow Car Chassis. Insert the Rollerball underneath the car.

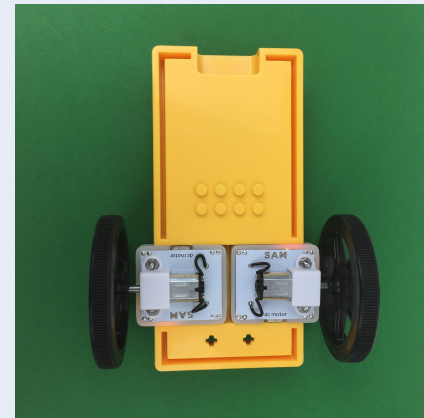


Worked Example

Step 4. Test the car using the tablet's inbuilt accelerometer to control the direction and speed of the car.



Step 5. Test it on grass.



Challenge 1

Step 1. Create a ramp.



Step 2. Add cardboard to the ramp.



Step 3. Test the car on cardboard.



Challenge 1

Step 4. Cover the cardboard with foil.



Step 5. Test the car on foil.





Checks for understanding

1. Why do the cardboard and foil surfaces affect the speed of the car or its ability to climb??

- A. *The friction is reduced on the cardboard*
- B. *The friction is increased on the foil*
- C. *The friction is increased on the cardboard*

2. Why does the car move on both surfaces??

- A. *The Slider makes it move*
- B. *The friction caused between tires and surface make it move*
- C. *The friction caused between tires and surface make it stop*

Challenge 1- Debug it

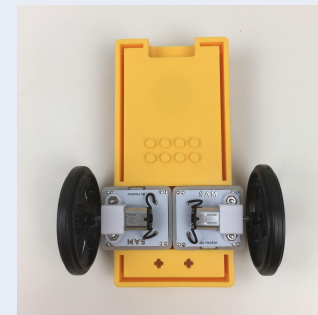
Step 1. Take the wheels out of the chassis.



Step 2. Remove the tyre from the wheel.



Step 3. Test it.



Challenge 2

Step 1. Cover part of the ramp with sandpaper.



Step 2. Place the car at the bottom of the ramp.



Step 3. Test it.



Step 4. Test other surfaces.





Checks for understanding

1. Why do the tires help the movement?

- A. *Because minimal friction is produced*
- B. *The tires are too big*
- C. *Rough rubber tires create more friction*

2. Why did the car move better on the sandpaper than on the foil?

- A. *There was no difference*
- B. *The cardboard was too high*
- C. *Sandpaper is rough so create more friction and therefore more grip.*



Tidy Up/Exit Ticket

✓ **Today I learned....**