



# FRICTION

We will explain friction using familiar objects

Repeat the opposite word/phrase.

FORCE

PUSH, PULL OR TWIST

SUCCESS CRITERIA

LEARNING OBJECTIVE



Repeat the opposite word/phrase.

SPRING BALANCE

MEASURES FORCES

Repeat the opposite word/phrase.

NEWTON

UNIT OF FORCE

Repeat the opposite word/phrase.

BALANCED FORCE

EQUAL IN OPPOSITE  
DIRECTIONS

Repeat the opposite word/phrase.

UNBALANCED FORCE

UNEQUAL OR SAME  
DIRECTION

Repeat the opposite word/phrase.

BUOYANCY

WHETHER IT FLOATS



Repeat the opposite word/phrase.

CONTACT FORCES

PHYSICAL CONTACT

Repeat the opposite word/phrase.

NON-CONTACT FORCES

NO PHYSICAL CONTACT

Which of the cars would have the **least** air resistance?

A



B



C



Which of the cars would have the **least** air resistance?

A



B



C



Which of the cars would have the **most** air resistance?

A



B



C



Which of the cars would have the **most** air resistance?

A



B



C



Calculate the net force from the diagram below.



Calculate the net force from the diagram below.

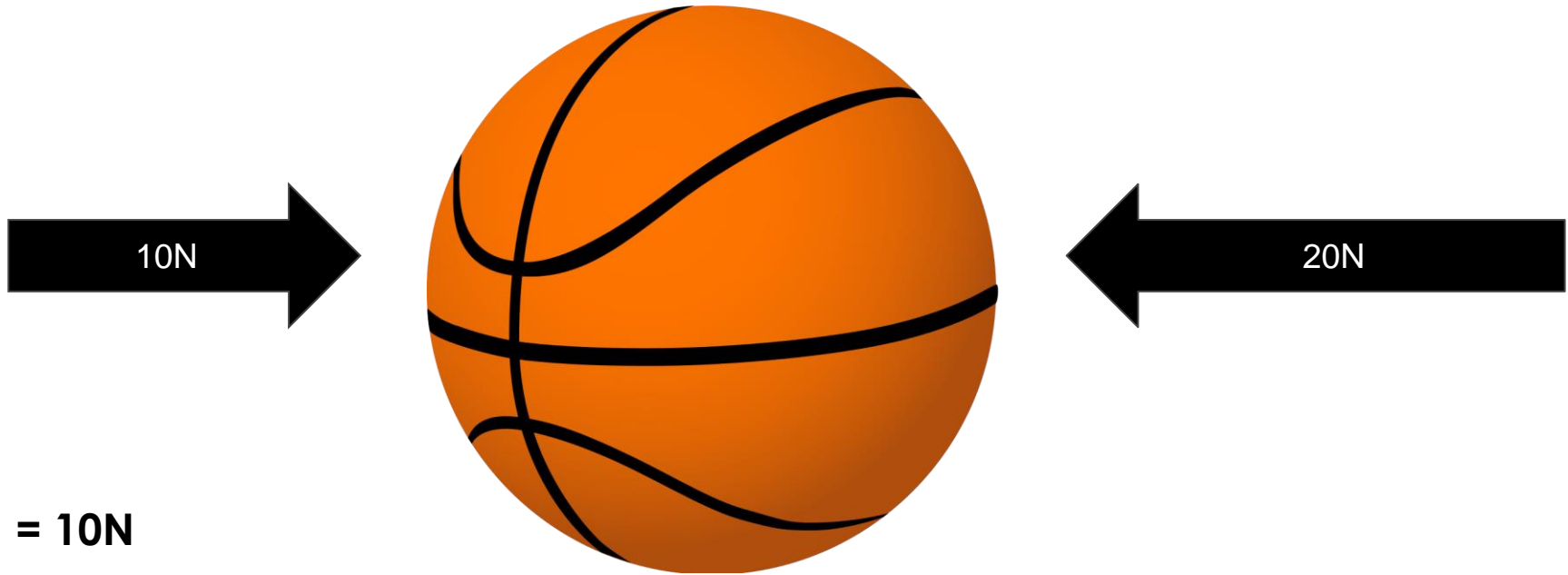




Calculate the net force from the diagram below.



Calculate the net force from the diagram below.



**= 10N**

Calculate the net force from the diagram below.



Calculate the net force from the diagram below.



**= 10N**

Complete the table below on your whiteboard.

<b>Force</b>	<b>Contact Force</b>	<b>Non-Contact Force</b>
Air resistance		
Magnet		
Buoyancy		
Gravity		

We will explain<sub>1</sub>  
friction using familiar<sub>2</sub>  
objects

TRACK WITH ME

READ WITH ME

- We will define friction
- We will use examples to explain how friction affects other forces

#### DEFINITION

- 1 - describe
- 2 - well-known

#### DECLARE THE OBJECTIVE

Read the learning objective to your partner.

## We will explain friction using familiar objects

### ACTIVATE PRIOR KNOWLEDGE

Some floors can be slippery at times, such as tiles or floorboards.

1. If you wanted to slide on the floor, would it be better to be barefoot or wearing socks?



# We will explain friction using familiar objects

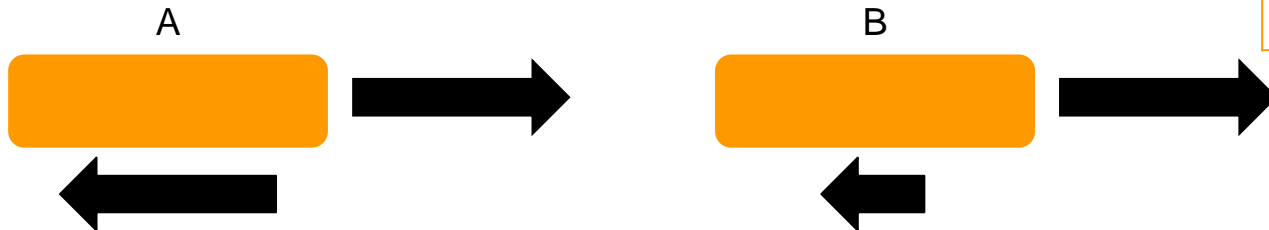
## ACTIVATE PRIOR KNOWLEDGE

Some floors can be slippery at times, such as tiles or floorboards.

1. If you wanted to slide on the floor, would it be better to be barefoot or wearing socks?



1. Which force diagram below do you think shows someone sliding on the floor wearing socks?



### MAKE THE CONNECTION

Students, you already know that forces occur when two objects interact. Have a think about whether socks reduces a force or increases a force?



# We will explain friction using familiar objects

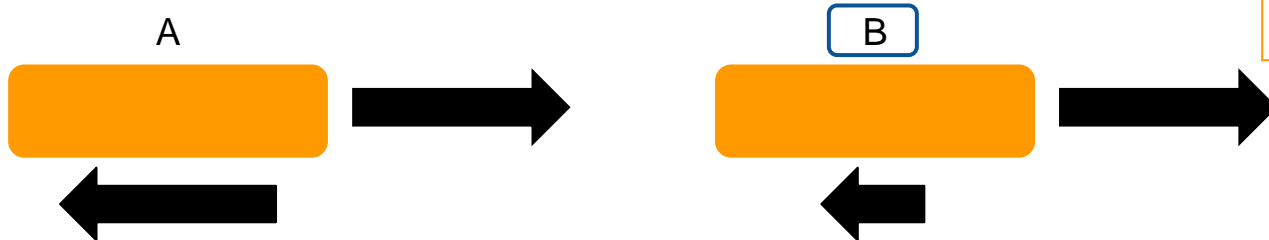
## ACTIVATE PRIOR KNOWLEDGE

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1. If you wanted to slide on the floor, would it be better to be barefoot or wearing socks?



1. Which force diagram below do you think shows someone sliding on the floor wearing socks?



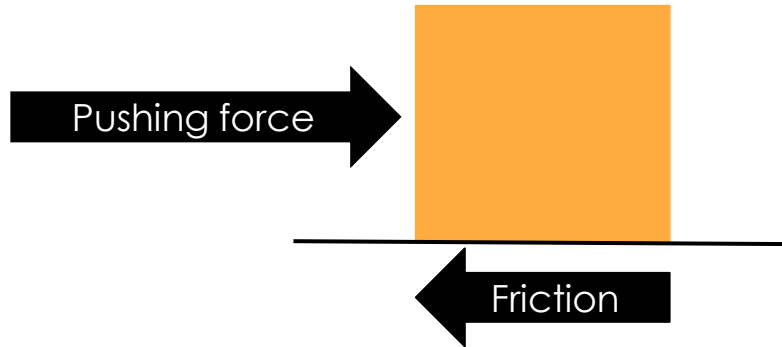
## MAKE THE CONNECTION

Students, you already know that forces occur when two objects interact. Have a think about whether socks reduces a force or increases a force?

## We will explain friction using familiar objects

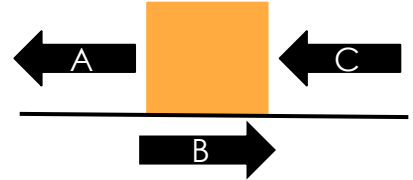
**Friction** is the force that resists<sup>1</sup> movement between two objects that are touching.

For example, there is friction when you push an object on a surface. It reduces the net force.



### CHECK FOR UNDERSTANDING

Looking at the diagram below, which arrow is the friction force? Justify your answer.



A B C

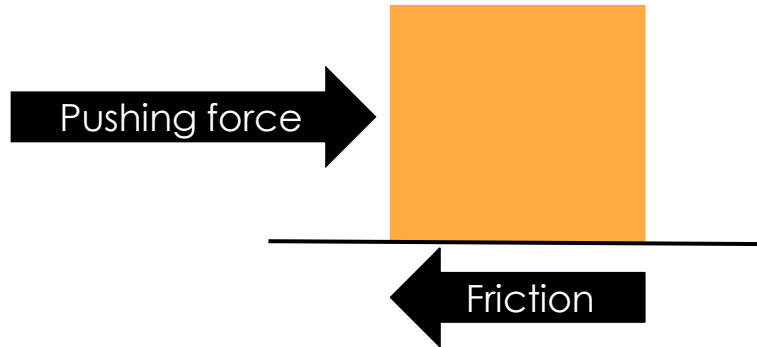
### DEFINITION

1 - stops or slows

## We will explain friction using familiar objects

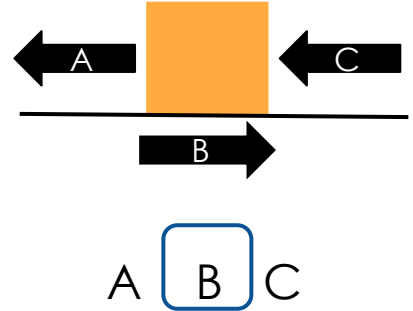
**Friction** is the force that resists<sub>1</sub> movement between two objects that are touching.

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Looking at the diagram below, which arrow is the friction force? Justify your answer.



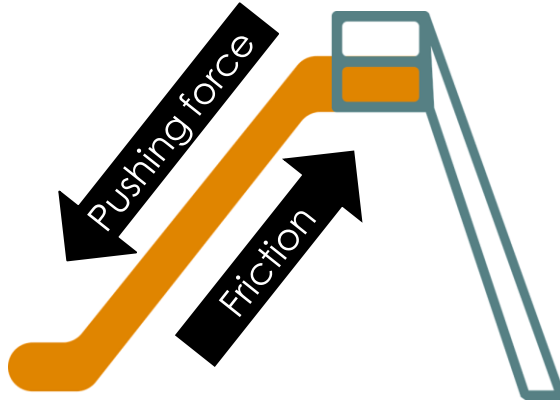
### DEFINITION

1 - stops or slows

## We will explain friction using familiar objects

**Friction** is the force that resists<sub>1</sub> movement between two objects that are touching.

On a playground slide, friction can slow you down. You can reduce friction on a slide if you use a soft piece of fabric or wear soft clothes.



### CHECK FOR UNDERSTANDING

In the image below, friction is occurring between:



- A. dog and ground
- B. ground and ball
- C. dog and ball

Justify your answer.

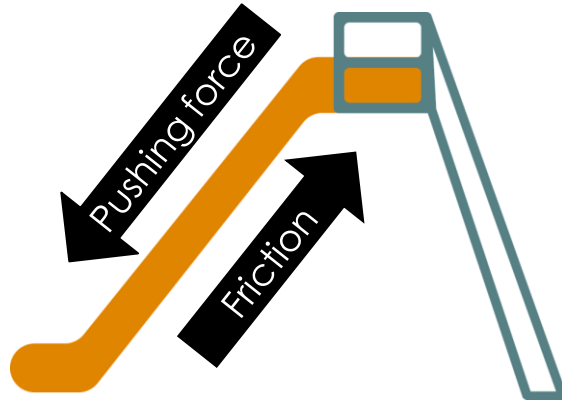
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- A. dog and ground
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- C. dog and ball

Justify your answer.

### DEFINITION

1 - stops or slows

# We will explain friction using familiar objects

1. Identify the objects which are being affected<sub>1</sub> by friction forces in the examples below.

Example	Two objects being affected by friction	
A. Scooter down a hill		
B. Using an iPad		
C. Sweeping the floor		

## CHECK FOR UNDERSTANDING

If friction **increases**, do objects slow down or speed up? Justify your answer.

## REMEMBER THE CONCEPT

Remember that **friction** is the force that resists movement between two objects that are touching.

## DEFINITION

1 - impacted

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A. Scooter down a hill	Scooter	Ground
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1. Identify the objects which are being affected<sub>1</sub> by friction forces in the examples below.

Example	Two objects being affected by friction	
A. Scooter down a hill	Scooter	Ground
B. Using an iPad	iPad screen	Finger
C. Sweeping the floor		

## CHECK FOR UNDERSTANDING

If friction **increases**, do objects slow down or speed up? Justify your answer.

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Remember that **friction** is the force that resists movement between two objects that are touching.

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1. Identify the objects which are being affected<sub>1</sub> by friction forces in the examples below.

Example	Two objects being affected by friction	
A. Scooter down a hill	Scooter	Ground
B. Using an iPad	iPad screen	Finger
C. Sweeping the floor	Broom	Floor

## CHECK FOR UNDERSTANDING

If friction **increases**, do objects slow down or speed up? Justify your answer.

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Remember that **friction** is the force that resists movement between two objects that are touching.

## DEFINITION

1 - impacted

## We will explain friction using familiar objects

**Friction** is the force that resists<sup>1</sup> movement between two objects that are touching.

We sometimes **increase** friction when we want something to stop or slow down. Such as catching a ball or opening a jar.

We can also **reduce** friction when we want something to stay moving or speed up. Such as a swimming race.

### CHECK FOR UNDERSTANDING

Can you think of an example from Phys. Ed. where you might need to increase or reduce friction?



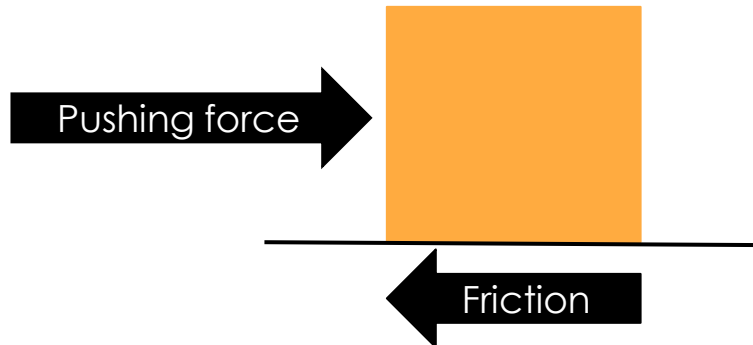
### DEFINITION

- 1 - stops or slows
- 2 - impacts

## We will explain friction using familiar objects

**Friction** is the force that resists<sub>1</sub> movement between two objects that are touching.

It is a **contact-force** and affects<sub>2</sub> every object which touches another object.



### CHECK FOR UNDERSTANDING

You are playing basketball and notice you are sliding all over the place on the court. Your shoes are worn out and you need new ones.

Below is a force diagram of you slipping on the court.



Draw a force diagram if your shoes were working properly.

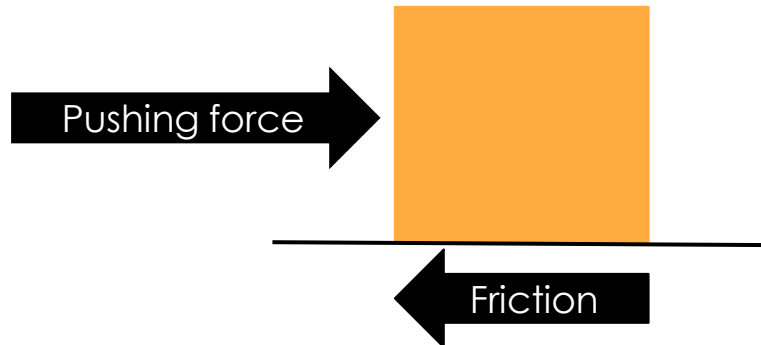
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### DEFINITION

1 - stops or slows

## We will explain friction using familiar objects

### CHECK FOR UNDERSTANDING

Using an example, what is friction?

### REMEMBER THE CONCEPT

Remember that **friction** is the force that resists movement between two objects that are touching.

### DEFINITION

1. For each of the following examples, **identify** the two objects which are affected by friction.
2. **Draw** a force diagram of each example and label the friction force.

Example	Two objects being affected by friction		Force Diagram
A. Closing a window			
B. Skateboard slowing down			
C. Cleaning a whiteboard			

We will explain<sub>1</sub>  
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objects

- We will define friction
- We will use examples to explain how friction affects other forces

**DEFINITION**

1 - describe  
2 - well-known

**CHECK FOR  
UNDERSTANDING**

Check Success Criteria.