



### Lesson Plan: Newton's Laws of Motion

**Grade Level:** 5

**Subject:** Physical Science

**Duration:** 45–60

**NGSS 5-PS2-1:** Support an argument that the gravitational force exerted by Earth on objects is directed down.

### Learning Objectives

By the end of this lesson, students will be able to:

- **Identify** forces such as gravity, friction, and inertia that affect an object's motion
- **Describe** Newton's three laws of motion and provide real-world examples of each
- **Explain** the relationship between force, mass, and acceleration



## PREVIEW

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- Printed copies of the Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-5-newton-s-laws-of-motion.pdf>)
- Activity Lesson: Newton's Laws of Motion (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-5-newton-s-laws-of-motion-newton-s-laws-of-motion-4.pdf>)
- Practice Worksheet 0 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-0.pdf>)
- Practice Worksheet 1 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-1.pdf>)



- Vocabulary Set 1 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-5-newton-s-laws-of-motion-1.pdf>)

### Lesson Procedure

#### Step 1: Introduction (5 minutes)

- Hook students by asking: 'Why is it harder to slide on grass than on ice, and what causes a soccer ball to stop rolling?'
- Introduce the concepts of motion, speed, and force using page 1 of the Study Guide. (<https://newpathworksheets.com/api/guide/study-guide-science-grade-5-newton-s-laws-of-motion.pdf>)

#### Step 2: Direct Instruction (15 minutes)

- Explain Newton's First Law (Inertia) and how objects resist changes in motion.



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[science-grade-5-newton-s-laws-of-motion-0.pdf](https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-0.pdf))

- Circulate the room to offer assistance and verify students are applying the concepts of mass and distance correctly.

#### Step 5: Assessment (10 minutes)

- Administer Practice Worksheet 1 as a formal check for understanding. (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-1.pdf>)



- Review the answers as a class, focusing particularly on scenarios involving roller coasters (friction) and Newton's laws.

### 💡 Differentiation Strategies

#### For advanced learners:

- Challenge students to identify simple machines (levers, pulleys, gears) in the classroom and explain how they alter the force needed to do work.
- Have students calculate simple power problems (Work / Time) as shown in the worksheets.

#### For learners needing support:

- Provide a vocabulary word bank with visual icons (e.g., an apple falling for gravity).
- Allow students to complete the independent practice in pairs to discuss their reasoning.



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- Worksheet 0 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-0.pdf>)
- Worksheet 1 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-1.pdf>)
- Worksheet 2 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-2.pdf>)
- Worksheet 3 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-newton-s-laws-of-motion-3.pdf>)



- Vocabulary 1 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-5-newton-s-laws-of-motion-1.pdf>)
- Vocabulary 2 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-5-newton-s-laws-of-motion-2.pdf>)



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## NEWTON'S LAW OF MOTION

We'll get to Newton's Laws of Motion in a moment...but first there are some important words we need to explore first...

### What is M - O - - T - - - I - - - - O - - - - N?

**Motion** is the process of an object changing its place or its position. Motion is *not* speed. **Speed** is the *rate* an object changes position.

→**FORCE**←

A **force** is a push or pull upon an object. Forces can change the position and motion of an object. There are forces that affect objects that come in physical contact with each other. There are also forces



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One last word to explore, **inertia**, which is an object's resistance to the change of motion.



## Newton's First Law of Motion

An object at rest tends to stay at rest and an object in motion tends to stay in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

Meaning, if you place a book on your desk, it will remain at rest on your desk unless something (or someone) causes it to move.

*Lesson Checkpoint: Describe Newton's First Law of Motion.*

## Newton's Second Law of Motion

The force of an object is equal to its mass times its acceleration.



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When object A exerts a force onto object B, object B exerts a force of equal strength in the opposite direction on object A.



*Lesson Checkpoint: Describe Newton's Third Law of Motion.*

## Newton's Law of Gravitation

**Newton's Universal Law of Gravitation** states that any two objects exert a gravitational force on each other. The strength of the gravitational force is dependent upon the mass of the objects. The larger the mass of the objects, the larger the force between the two objects. The strength of the gravitational force is also dependent upon the distance between the objects. The farther away the two objects are, the weaker the gravitational force is between them.

### Gravity Facts:

If you drop an object, it will fall directly to the ground – because of gravity.

Planets orbit around the sun - because of gravity.

## Work, Work, Work



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point, called a fulcrum, and can be used to move an object up or down.

A **wedge** is simple machine that is actually two inclined planes joined together back to back. Wedges are often used to split wood.

A **gear** is made of two wheels that have notches that fit together either directly or by a chain or belt which allows one wheel to turn the other wheel. Gears help clocks and bicycles move.

**Lesson Checkpoint: What is one type of simple machine?**



# Newton's Laws of Motion

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Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**Motion** is the process of an object changing place or position.



**Speed** is a measure of how fast an object is moving.



**Force** is a **push or pull** upon an object. Forces can **change** the position and motion of an object.

**Gravity** is an **attractive force** that pulls objects together. Gravity depends on the **mass** of the objects and the **distance** between them.



The moon revolves around Earth because of the gravitational force between them.



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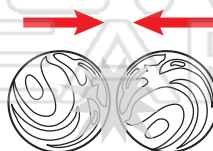
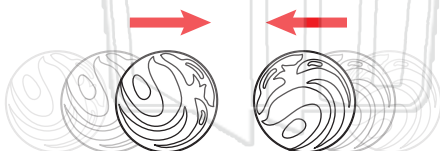
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amount of force applied.

## Newton's 3<sup>rd</sup> Law of Motion

For every action there is an equal and opposite reaction.



Marbles exert equal force on each other.



Both marbles change velocity and direction.



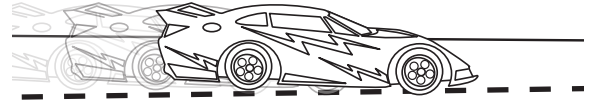
# Newton's Laws of Motion

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Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

Fill in the blanks.

\_\_\_\_\_ is the process of an object changing place or position.



\_\_\_\_\_ is a measure of how fast an object is moving.

\_\_\_\_\_ is a **push or pull** upon an object. It can **change** the position and motion of an object.

\_\_\_\_\_ is an **attractive force** that pulls objects together.



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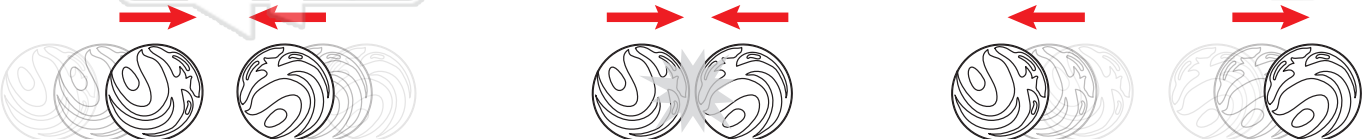
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\_\_\_\_\_ and the amount of \_\_\_\_\_ applied.

## Newton's 3<sup>rd</sup> Law of Motion

For every action there is an \_\_\_\_\_ and \_\_\_\_\_ reaction.



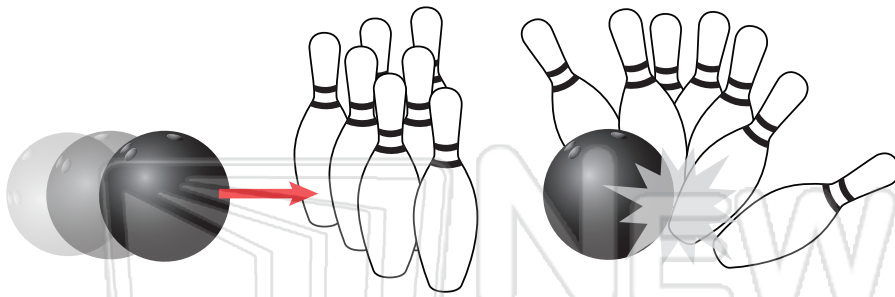


# Newton's Laws of Motion

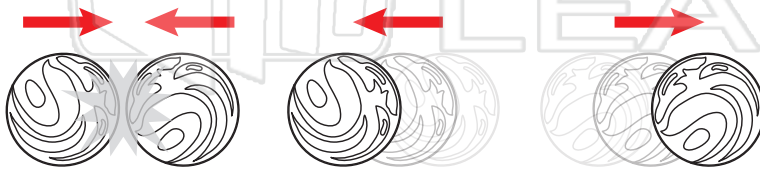
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Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

Look at each example. Check the Law of Motion that is being illustrated.



- 1<sup>st</sup> Law of Motion
- 2<sup>nd</sup> Law of Motion
- 3<sup>rd</sup> Law of Motion

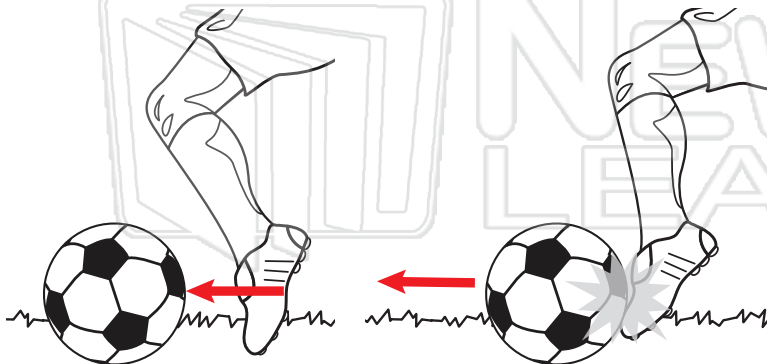


- 1<sup>st</sup> Law of Motion
- 2<sup>nd</sup> Law of Motion
- 3<sup>rd</sup> Law of Motion



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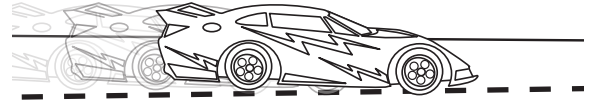
- 1<sup>st</sup> Law of Motion
- 2<sup>nd</sup> Law of Motion
- 3<sup>rd</sup> Law of Motion



## Answer Key

Fill in the blanks.

**Motion** is the process of an object changing place or position.



**Speed** is a measure of how fast an object is moving.

**Force** is a **push or pull** upon an object. It can **change** the position and motion of an object.

**Gravity** is an **attractive force** that pulls objects together.



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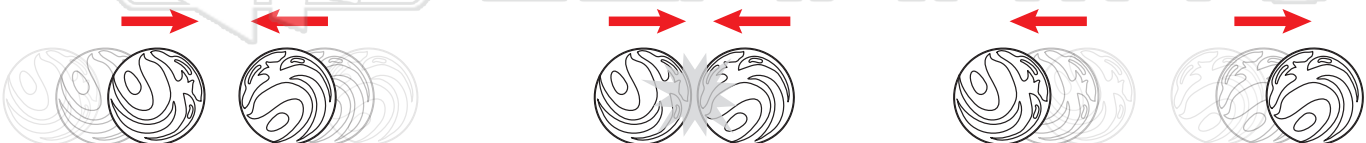
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**mass** and the amount of **force** applied.

### Newton's 3<sup>rd</sup> Law of Motion

For every action there is an **equal** and **opposite** reaction.



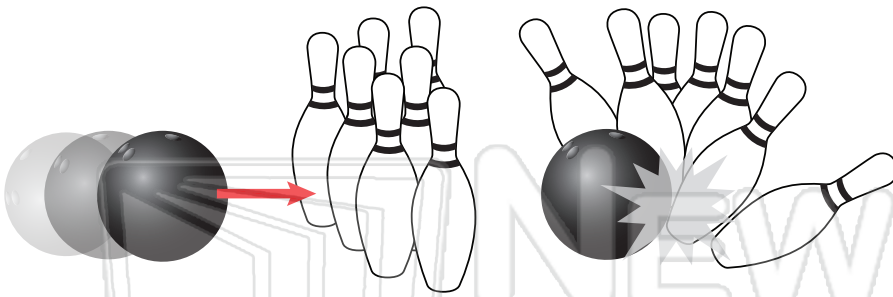


# Newton's Laws of Motion

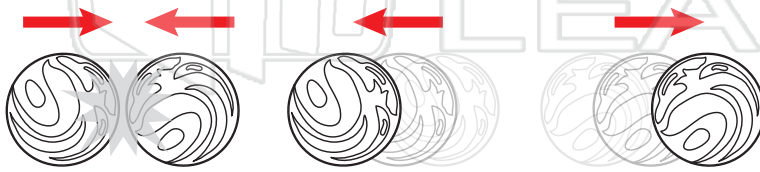
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## Answer Key

Look at each example. Check the Law of Motion that is being illustrated.



- 1<sup>st</sup> Law of Motion
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- 3<sup>rd</sup> Law of Motion

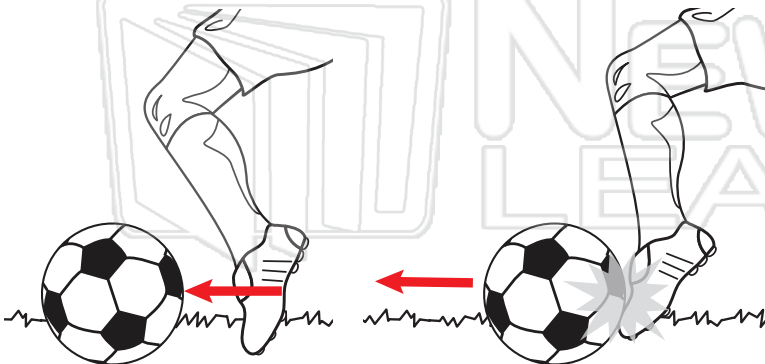


- 1<sup>st</sup> Law of Motion
- 2<sup>nd</sup> Law of Motion
- 3<sup>rd</sup> Law of Motion



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- 1<sup>st</sup> Law of Motion
- 2<sup>nd</sup> Law of Motion
- 3<sup>rd</sup> Law of Motion



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

1

\_\_\_\_\_ is the process of an object **changing its place or its position.**

- A Friction
- B Motion
- C Speed
- D Force



2

Which is an example of an object **in motion**?

- A a basketball on a rack
- B a soccer ball resting in grass
- C a bowling ball rolling
- D a tennis ball sitting in a container



3

What is a **push or pull** upon an object?

- A inertia
- B motion
- C friction
- D force



4

Max **pushed** his book and the book **moved** 7 centimeters to the right on the table. **What could Max now determine about a force?**

- A It can change the position of an object.
- B It does not move objects.



5



## PREVIEW

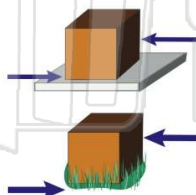
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9

\_\_\_\_\_ is a **force** that goes **against an object** as it moves along a surface.

- A Inertia
- B Motion
- C Friction
- D Gravity



10

Which of the following can happen as a result of **friction**?

- A an object can speed up
- B an object can slow down
- C an object can go twice as fast
- D all of the above





Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

1 \_\_\_\_\_ is the process of an object **changing its place or its position.**

- A Friction
- B Motion
- C Speed
- D Force



(B)

2 Which is an example of an object **in motion**?

- A a basketball on a rack
- B a soccer ball resting in grass
- C a bowling ball rolling
- D a tennis ball sitting in a container



(C)

3 What is a **push or pull** upon an object?

- A inertia
- B motion
- C friction
- D force



(D)

4 Max **pushed** his book and the book **moved** 7 centimeters to the right on the table. **What could Max now determine about a force?**

- A It can change the position of an object.
- B It does not move objects.



(A)

5



(C)

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7

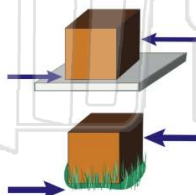
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(D)

9

\_\_\_\_\_ is a **force** that goes **against an object** as it moves along a surface.

- A Inertia
- B Motion
- C Friction
- D Gravity



(C)

10

Which of the following can happen as a result of **friction**?

- A an object can speed up
- B an object can slow down
- C an object can go twice as fast
- D all of the above




(B)



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

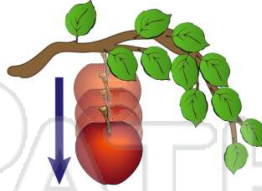
1 In what way do designers of roller coasters use **friction** to their **advantage**?



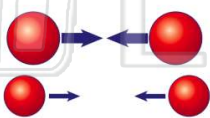
A to slow down roller coasters  
B to make roller coaster speed up  
C to keep roller coasters in motion  
D to help roller coasters sound louder

2 \_\_\_\_\_ is an **attractive force** that attempts to pull two objects **together**.

A Work  
B Friction  
C Gravity  
D Inertia




3 **Mass** and **distance** affect \_\_\_\_\_.



A an object's speed  
B an object's color  
C the strength of gravity

4 Objects in motion tend to **stay in motion**. Motion only changes if an unbalanced outside force causes change. This **resistance to change** of motion is called \_\_\_\_\_.


A inertia




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- B its weight divided by its acceleration  
C its mass times its acceleration  
D its width times its speed


- C the paper clip  
D the crayon
- 

9 According to **Newton's third law of motion**, what does **every action** have?

A no reaction  
B an equal and opposite reaction  
C the same reaction  
D a larger reaction



10 When object A exerts a force onto object B, object B exerts a force of **equal strength in the opposite direction** on object A. Which of **Newton's laws** does this example support?



A Newton's gravitational law  
B Newton's third law of motion  
C Newton's second law of motion  
D Newton's first law of motion



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

1 In what way do designers of roller coasters use **friction** to their **advantage**?

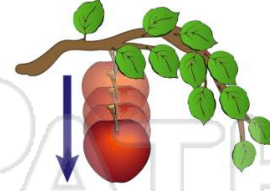


- A to slow down roller coasters
- B to make roller coaster speed up
- C to keep roller coasters in motion
- D to help roller coasters sound louder

(A)

2 \_\_\_\_\_ is an **attractive force** that attempts to pull two objects **together**.

- A Work
- B Friction
- C Gravity
- D Inertia



(C)

3 **Mass** and **distance** affect \_\_\_\_\_.



- A an object's speed
- B an object's color
- C the strength of gravity

(C)

4 Objects in motion tend to **stay in motion**. Motion only changes if an unbalanced outside force causes change. This **resistance to change** of motion is called \_\_\_\_\_.

- A inertia



(A)

5



(D)

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(A)

- B its weight divided by its acceleration
- C its mass times its acceleration
- D its width times its speed

- C the paper clip
- D the crayon



9 According to **Newton's third law of motion**, what does **every action** have?

- A no reaction
- B an equal and opposite reaction
- C the same reaction
- D a larger reaction



(B)

10 When object A exerts a force onto object B, object B exerts a force of **equal strength in the opposite direction** on object A. Which of **Newton's laws** does this example support?



- A Newton's gravitational law
- B Newton's third law of motion
- C Newton's second law of motion
- D Newton's first law of motion

(B)



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Match each of the following terms to its definition:

Wheel and axle

Wedge

Friction

Gear

Force

Pulley

Lever

Gravity

1. \_\_\_\_\_ - a push or pull upon an object that causes it to change speed or direction



2. \_\_\_\_\_ - a force of attraction that pulls objects toward each other; the force of attraction between two objects



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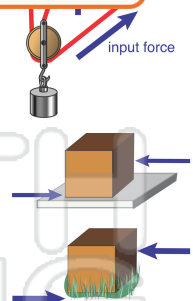
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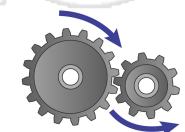
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7. \_\_\_\_\_ - a force of resistance between two objects in contact with each other that works in the opposite direction of an object that is moving



8. \_\_\_\_\_ - a simple machine that is made of two wheels that have notches that fit together either directly or by a chain or belt which allows one wheel to turn the other wheel





Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**Match each of the following terms to its definition:**

Wheel and axle

Wedge

Friction

Gear

Force

Pulley

Lever

Gravity

**1. force** - a push or pull upon an object that causes it to change speed or direction



**2. gravity** - a force of attraction that pulls objects toward each other; the force of attraction between two objects



**3. wheel and axle**



**4. wheel and axle**

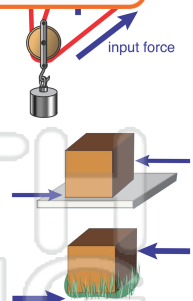
**5. lever**

**6. pulley**

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**7. friction** - a force of resistance between two objects in contact with each other that works in the opposite direction of an object that is moving



**8. gear** - a simple machine that is made of two wheels that have notches that fit together either directly or by a chain or belt which allows one wheel to turn the other wheel

