

## Forces SC.5.P.13.1 & SC.5.P.13.2

### I Sense a Disturbance in the Force... and Motion - CPalms Student Tutorial

Force is a \_\_\_\_\_ or a \_\_\_\_\_ on an object.

Push forces move objects \_\_\_\_\_, but pull forces move objects \_\_\_\_\_ the pull force.

#### Practice 1:

Place a check mark in the correct column to identify if the event is a push or a pull.

Event	Push	Pull
Tug of war team on a rope		
Moving forward mowing the grass		
A boat towing a water skier		
Dog on a leash walking too fast		

Matter is the \_\_\_\_\_ that makes up objects around us.

Matter has \_\_\_\_\_ and takes up \_\_\_\_\_.

\_\_\_\_\_ can be measured on a \_\_\_\_\_.

#### Practice 2:

**Complete the sentence by typing the word that best completes the sentence.**

Objects are made of matter and anything made of matter takes up space (volume) and has \_\_\_\_\_.

An object in motion will continue its motion until acted on by an \_\_\_\_\_, like friction.

An object at rest will remain at \_\_\_\_\_ until acted on by an \_\_\_\_\_ force, like a \_\_\_\_\_ or a pull.

Balanced forces do not cause a change in \_\_\_\_\_.

Unbalanced forces will cause a change in \_\_\_\_\_.

Unbalanced forces can change an object's motion in three ways:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**Practice 3:**

Select the item that best completes the statement based on the first law of motion.

An object in motion will continue in motion and an object at rest will stay at rest unless a(n) \_\_\_\_\_ force acts on the object.

**Practice 4:**

Place a check mark in the correct column to identify if the event is a balance force or an unbalanced force.

Event	Balanced Force	Unbalanced Force
A child starts running.		
A child sits in a chair.		
A dog lays sleeping.		
A Skateboarder rides down a ramp.		

Force is something that can be \_\_\_\_\_.

The more \_\_\_\_\_ an object, the more \_\_\_\_\_ that is needed to \_\_\_\_\_ its motion.

**Practice 5:**

Place a check mark next to each object that would require more force to move than a basketball.

Object	More force needed
Passenger car	
Golf ball	
Very large boulder	
couch	

The greater the force, the \_\_\_\_\_ in motion of the object.

**Practice 6:**

Place a check mark in the correct column to identify if the event will result in a smaller change in motion or a greater change in motion.

Event	Smaller change in motion	Larger change in motion
Driving from the tee with a large force.		
Tapping a put in with a small force.		
An adult hitting a ball with a large force.		
A child hitting a ball with a small force.		

**Reading Passage: Gravity**

Gravity is a force of attraction between two objects. Gravity pulls objects together without them touching each other. On Earth, gravity pulls objects toward the center of the planet. This constant pulling keeps objects on Earth's surface from flying off into space. Gravity also causes objects to fall towards the ground. If you push your pencil off of your desk, gravity will pull it to the ground. How does gravity keep objects on Earth from flying off into space?

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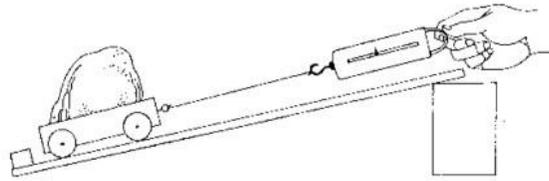
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**Check What You Know:**

1. Jerry was studying his vocabulary terms for a test. He came across a statement with no word. It says, "when two objects interact—that is, when one object does something to the other object". Which of the terms below belongs with this statement?  
A. Energy                                      B. Force  
C. Newtons                                      D. Mass

2. In this experiment, Charlie is using just enough force to keep the car moving up the ramp.



What type of force is Charlie using?

- A. Pushing
- B. Friction
- C. Gravity
- D. Pulling

### Force and Motion: Video

Force is a \_\_\_\_\_ and \_\_\_\_\_.

The unit of force is a \_\_\_\_\_.

What can force do?

A force can make an object \_\_\_\_\_.

A force can change the \_\_\_\_\_ of a \_\_\_\_\_ object.

A force can make a moving object \_\_\_\_\_.

A force can \_\_\_\_\_ a moving object.

A force can change the \_\_\_\_\_ of an \_\_\_\_\_.

Force can be classified into 2 types of force: \_\_\_\_\_ and \_\_\_\_\_.

Contact force is a force that needs the objects to \_\_\_\_\_ for the force to work.

Non-contact force is a force that can happen \_\_\_\_\_ the objects touching.

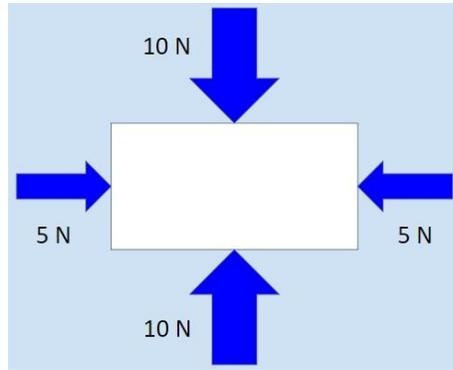
1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Magnetic force is the \_\_\_\_\_ or \_\_\_\_\_ exerted by a magnet.

Electrostatic force is the force that exists between all \_\_\_\_\_ particles.

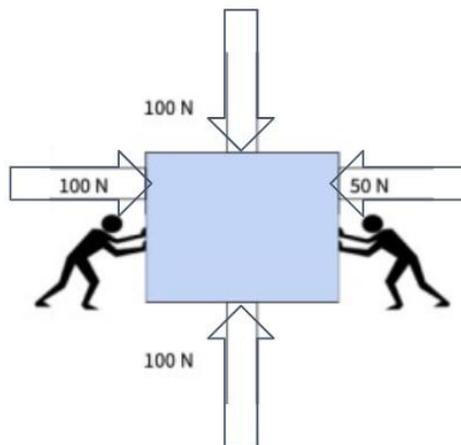
Gravitational force is the force that \_\_\_\_\_ each other.

## Balanced Forces



The forces acting on this object are balanced. If this object is stationary, it will remain in the same location. If this object is moving, then it will continue to move at the same speed. It will not speed up nor slow down.

## Unbalanced Forces



The forces acting on this object are unbalanced. If this object started off in a stationary position, how do you think it will likely move? \_\_\_\_\_

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## Check What You Know

- In the vacuum of space, objects are weightless and float freely through the air. On Earth, objects have weight and are held firmly to the ground. What force is responsible for keeping objects on Earth from floating away?
  - A) Air resistance
  - B) friction
  - C) gravity
  - D) A normal force
- Kwan places a set of marbles on the table. He notices that when he runs a magnet by them, some of the marbles are pulled to the magnet in his hand. What would be the reason for why this is happening?
  - A) Some of the marbles are made of wood.
  - B) Some of the marbles are made of glass.
  - C) Some of the marbles are made of plastic.
  - D) Some of the marbles are made of iron.
- When is it clear that balanced forces are acting on an object?
  - A) The object's motion stops.
  - B) The object's motion does not change.
  - C) The object changes direction.
  - D) The object begins moving.
- Anita is bicycling on a flat, straight road. She changes gears, so she needs to use more force.



Which of the following best describes the effect of the applied force on the pedals?

- A. The greater the force applied, the slower the bicycle travels.
  - B. The greater the force applied, the greater the effect of friction on the bicycle's speed.
  - C. The greater the force applied, the greater the change in the bicycle's motion.
  - D. The greater the force applied, the less effect that mass has on the bicycle's motion.
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- Gravity is a force that pulls one object towards the center of another object. Which one of the following would be an example of gravity?
    - A. The ball is kicked into the air.
    - B. The Earth pulls the ball back to the ground.
    - C. The ball slows down as it rolls across the grass.
    - D. The speed the ball travels depends on the pushing force used to kick it.

- Ashley attached a bar magnet to the top of a toy car. She then took another bar magnet and placed it near the back of the toy car. As she moved the magnet closer to the toy car, it would move away. Why did the toy car keep moving away?
  - A. The car wasn't magnetic, so it caused it to repel.
  - B. The end of the magnet on the back of the car was a north pole and the end she was moving towards it was a south pole.
  - C. The end of the magnet on the back of the car was a south pole and the end she was moving towards it was a north pole.
  - D. The end of the magnet on the back of the car was a south pole and the end she was moving towards it was a south pole.
  
- Devon's teacher was demonstrating an experiment to see if he could spin a basketball on the end of his finger. He asked the class whether the ball was in motion, which student is correct?
  - a. Isaiah stated that the ball could not be in motion because it did not move from his finger.
  - b. Devon stated that the ball could not be in motion because it was not changing directions.
  - c. Sophia stated that the ball had to be in motion because it was continually changing its position.
  - d. Joshua stated that the ball had to be in motion because he was balancing it on the end of his finger without it falling.
  
- Tyler was pushing his car up a hill. He got half way up the hill and couldn't move the car any farther even though he was still pushing with the same amount of force. Why was the car no longer moving?
  - a. The force of friction caused by the road stopped the car from moving.
  - b. The force of gravity became stronger than the force Tyler was pushing with.
  - c. The force of friction by the air pushing down on the car was stronger higher up the hill.
  - d. The pulling force of gravity on the car was now equal to the pushing force that Tyler exerted on the car.
  
- Jada was conducting an experiment on how things move. She used two spheres of equal volume. She pushed both spheres with 20 newtons of force. Sphere A went 15 meters and Sphere B went 25 meters. How can this movement be explained?
  - a. Sphere A has a greater mass than sphere B.
  - b. Sphere B has a greater mass than sphere A.
  - c. Jada pushed sphere A with less force than sphere B.
  - d. Jada pushed sphere B with more force than sphere A.