

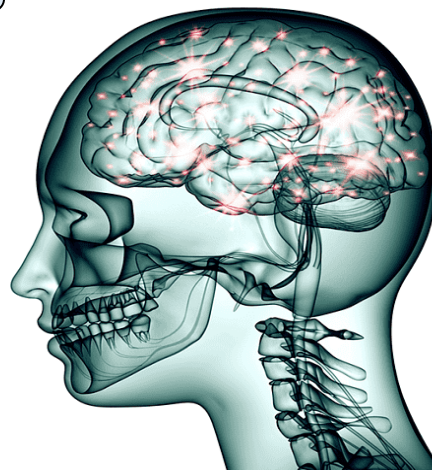


interactive SCIENCE



WORKBOOK

Grade 6



SEMESTER

2

Name: _____

Class: _____

Teacher: _____

PEARSON

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GRADE 6

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WORKBOOK CHECKLIST



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Grade 6: _____

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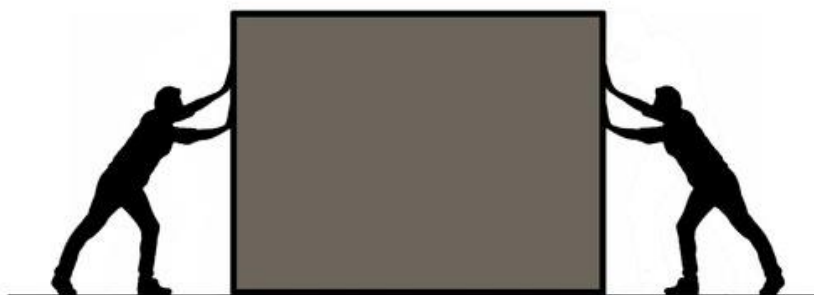
Date: ___/___/___

Lesson 1: The Nature of Force (use with pages 254 – 259)**Fill in the blank to complete each statement.**

1. When you pull on a window shade, you exert a(n) _____.
2. A(n) _____ can be used to represent the direction and strength of a force.
3. The strength of a force is measured in _____.
4. The net force determines how and if an object will _____.
5. When two forces act in opposite directions, the object will accelerate in the same direction as the _____ force.
6. A force is described by its _____ and by the direction in which it acts.

**Modified True or False: If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true.**

- _____ 1. Balanced forces do not change the motion of an object.
- _____ 2. Forces cause some changes in motion.
- _____ 3. A net force causes no change in an object's motion.
- _____ 4. If Faisal exerts a force of 10 N to push a box to the right at the same time Sultan exerts a force of 15N to push the box to the left, the box will move to the left.





In the Venn diagram, write the phrases listed below to describe unbalanced forces and balanced forces. Write the characteristics shared by unbalanced and balanced forces in the area of overlap.

change an object's motion

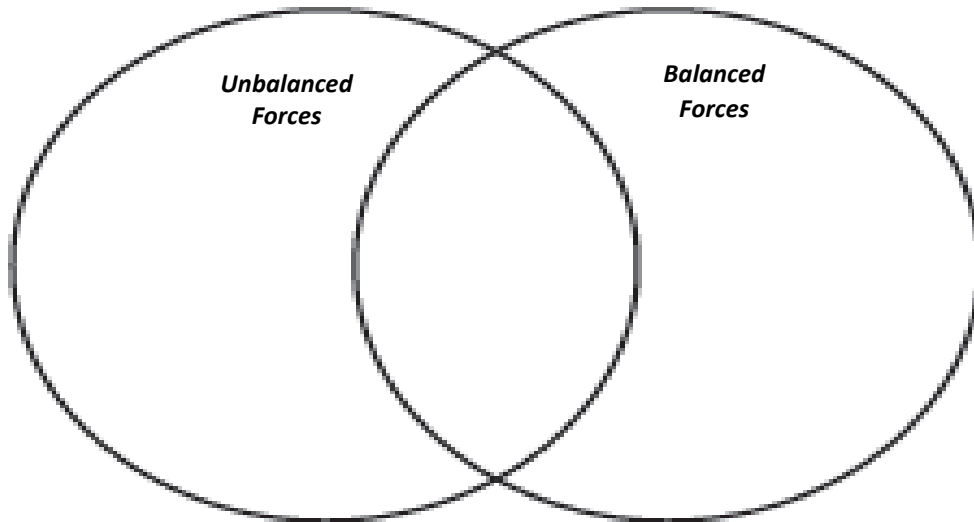
push or pull

do not change an object's motion

have direction

net force = 0 N

net force does not equal 0 N



Answer the following questions.

1. *Your friend increases her force on the desk by 30 N. He doesn't change the direction of his push. What happens to the net force on the desk? Will the desk accelerate?*



Name: _____

Date: ___/___/___

Lesson 2: Friction and Gravity (use with pages 260 – 267)Circle the letter of the correct answer.

1. When you swim in a pool, _____.

a. sliding friction occurs

c. rolling friction occurs.

b. static friction occurs

d. fluid friction occurs.

2. When you rub your palms together, _____.

a. sliding friction occurs

c. rolling friction occurs.

b. static friction occurs

d. fluid friction occurs.

3. When you skateboard on a ramp, _____.

a. sliding friction occurs

c. rolling friction occurs.

b. static friction occurs

d. fluid friction occurs.

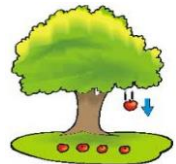
4. When you push a desk that doesn't move, _____.

a. sliding friction occurs

c. rolling friction occurs.

b. static friction occurs

d. fluid friction occurs.

Fill in the blank to complete each statement.

1. The _____ states that the force of gravity acts between all objects in the universe that have mass.

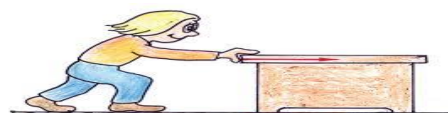
2. As distance increases, gravitational force _____.

3. When you stand on a bathroom scale, it displays the _____ that Earth is exerting on you.

4. Friction acts in a direction _____ to the direction of the object's motion.

5. When the irregularities of one surface come into contact with those of another surface, _____ occurs.

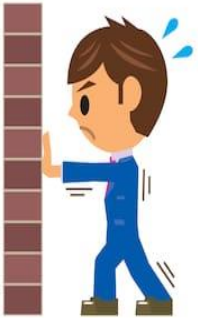
6. The applied force required to push something across a surface _____ as friction increases.



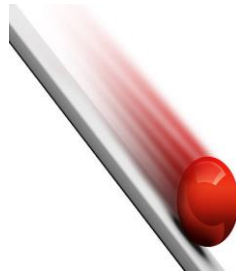


Label the given pictures below.

Static Friction	Fluid Friction
Rolling Friction	Sliding Friction







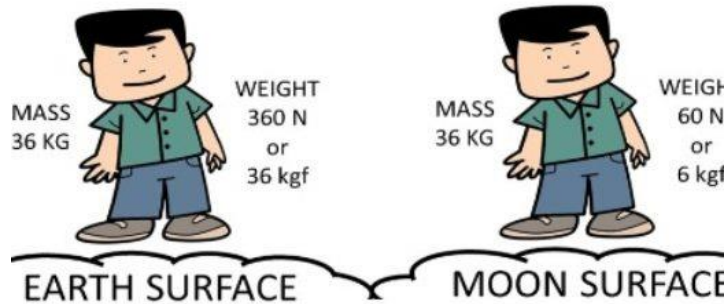




Answer the following questions.

1. How does mass differ from weight?

2. If the mass of Earth increased, what would happen to your weight? What about your mass?



Name: _____

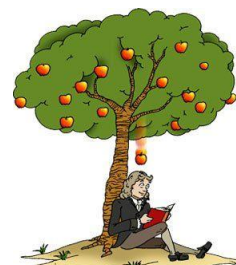
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Lesson 3: Newton's Laws of Motion (use with pages 268 – 275)**Fill in the blank to complete each statement.**

1. Newton's second law of motion states that an object's acceleration depends on its _____ and on the net force acting on it.
2. Acceleration is measured in _____.
3. Force is measured in a unit called the _____.
4. The smaller the mass of an object, the _____ its inertia.

**Modified True or False: If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true.**

- _____ 1. Newton's first law of motion states that an object will not experience a change in motion unless acted upon by a(n) **balanced** force.
- _____ 2. To increase acceleration of an object, you reduce its **mass** or increase the applied force.
- _____ 3. Newton's third law of motion states that if one object exerts a force on another object, then the second object exerts a force of equal strength in the **same** direction.
- _____ 4. Resistance to change in motion is called **stasis**.
- _____ 5. Action and reaction forces acting in opposite directions **do** cancel out because they act on different objects.
- _____ 6. If you lean against a wall, the wall pushes back on you with a(n) **weaker** force.
- _____ 7. If you increase the force on an object, its acceleration **increases**.
- _____ 8. If you increase the mass of an object, its acceleration **decreases**.
- _____ 9. To accelerate a 3 kg skateboard at 9 m/s^2 , a force of **3 newton** is needed.
- _____ 10. The amount of inertia an object has depends on its **speed**.





Answer the following questions.



1. How does the diagram at the right illustrate Newton's third law of motion?

2. If the mass of the skateboard doubled but the net force on it remained constant, what would happen to the acceleration of the skateboard?



Name: _____

Date: ___/___/___

Lesson 4: Momentum (use with pages 276 – 279)**Circle the letter of the correct answer.**

1. Which of the following, moving at the same speed, would be hardest to stop?

- | | |
|----------------|-------------|
| a. car | c. frisbee |
| b. fire engine | d. stroller |

2. Which moving object, in all likelihood, will have the greatest momentum?

- a. volleyball hit by a fourth-grader
 b. volleyball hit by an Olympic volleyball player
 c. volleyball hit by a senior adult
 d. volleyball hit by a basketball coach

3. Which formula is used to calculate momentum?

- | | |
|-------------------------------------|--|
| a. Momentum = Mass \times Speed | c. Momentum = Volume \times Velocity |
| b. Momentum = Weight \times Speed | d. Momentum = Mass \times Velocity |

4. In which situation does the law of conservation of momentum apply?

- | | |
|--|--------------------------------------|
| a. in the absence of greatest velocity | c. in the absence of outside forces |
| b. in the presence of least velocity | d. in the presence of outside forces |

**Modified True or False: If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true.**

- _____ 1. The total momentum of any group of objects remains the same unless outside forces act on the objects.
- _____ 2. If outside forces such as friction are negligible, when two objects of the same mass collide and do not stick together, the objects multiply velocities.
- _____ 3. Newton's "quantity of motion" is conservation.
- _____ 4. The less momentum an object has, the easier it is to stop.
- _____ 5. Momentum, like velocity, is described by both a direction and a force.
- _____ 6. The momentum of a 1000-kg vehicle traveling at a velocity of 25 m/s is 40kg \times m/s.



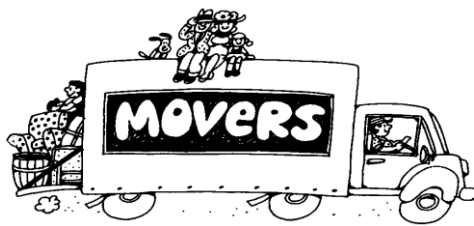
Answer the following questions.

1. Suppose you have two toy cars. Each has a mass of 0.04 kg. The cars have tape on their bumpers that will cause them to stick together. One car is stopped on the track. The other car, traveling at a velocity of 4 m/s, hits the first car. What is the momentum of the coupled cars? Show your calculations, and explain your answer.



Solution:

2. How can a heavy moving van have the same momentum as a small motorcycle?



Name: _____

Date: ___/___/___

Lesson 5: Free Fall and Circular Motion (use with pages 280 – 283)Circle the letter of the correct answer.

1. The state that exists when the only force acting on an object is gravity is called _____.

- a. free fall
b. inertia
c. acceleration
d. momentum

2. The acceleration due to gravity near the surface of Earth is equal to _____.

- a. 9.8 m/s
b. 9.8 kg × m/s
c. 9.8 N
d. 9.8 m/s²

3. Satellites in orbit around Earth travel in an almost circular path because Earth is _____.

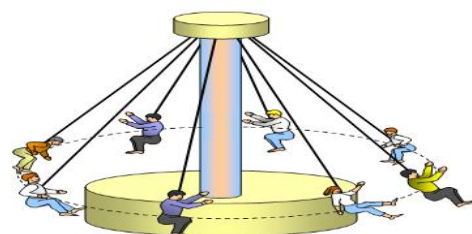
- a. centripetal
b. free falling
c. curved
d. massive

4. The word *centripetal* means _____.

- a. center seeking
b. gravitational
c. continuous
d. free falling

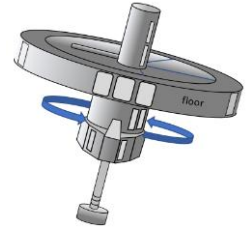
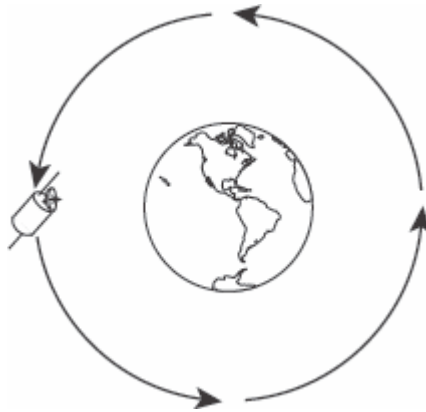
Fill in the blank to complete each statement.

- The force that causes an object to move in a circle is called _____.
- Any object that travels around another object in space is a(n) _____.
- An object traveling in a circle is accelerating because it is constantly changing _____.
- _____ is the centripetal force that causes a satellite to move in a circle.
- Satellites in orbit around Earth continually fall toward _____.
- If you could turn off a centripetal force, _____ would cause the object to fly off in a straight line.





Draw an arrow representing centripetal force in the diagram below.



Answer the following questions.

1. What is the force that causes objects to move in circles?

2. If Earth's gravity could be turned off, what would happen to satellites that are currently in orbit? Explain your reasoning.



Name: _____

Date: ___/___/___

Lesson 1: Electric Charge and Static Electricity (use with pages 296 – 303)



Circle the letter of the correct answer.

1. Atoms contain charged particles called _____.

- a. protons, neutrons, and electrons
- b. protons and electrons
- c. protons and neutrons
- d. electrons and neutrons



2. A region around a charged object where the object's electric force is exerted on other charged objects is an electric _____.

- a. field
- b. outlet
- c. socket
- d. power plant



3. In static electricity, charges _____.

- a. flow continuously
- b. flow intermittently
- c. build up in an atom
- d. build up on an object

4. Charges can redistribute themselves by friction, conduction, polarization, or _____.

- a. reduction
- b. production
- c. induction
- d. superconduction



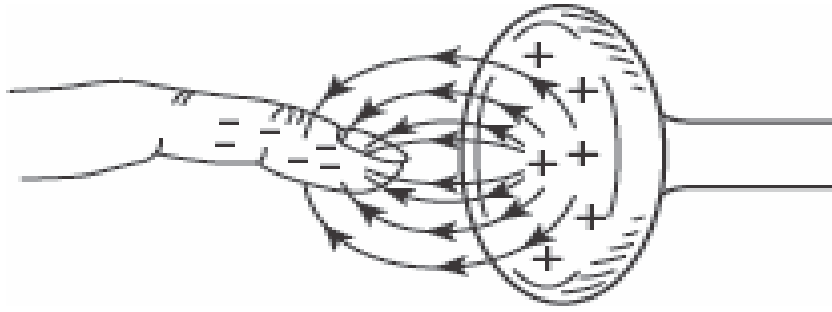
Modified True or False: If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true.

- _____ 1. Charges that are different repel each other.
- _____ 2. An electric field gets stronger the closer it is to the charge.
- _____ 3. Charges do not transfer between objects in polarization or conduction.
- _____ 4. Lightning is an example of static discharge.
- _____ 5. Electric current is the buildup of charges on an object.
- _____ 6 Most objects have some overall charge.





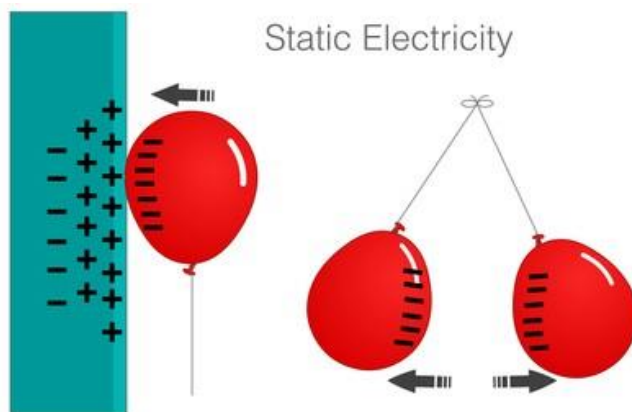
Understanding Main Ideas: *The person whose finger is shown below has walked across a carpet and is about to touch the doorknob. Answer the following questions in the spaces provided.*



1. Are the charges in the doorknob attracted or repelled by the charges in the finger? How can you tell?

2. What do the lines around the finger and doorknob represent?

3. One kind of static electricity is a result of electrons moving onto an object from another object. What is another way static electricity can build up on an object?



Name: _____

Date: ___/___/___

Lesson 2: Electric Current (use with pages 304 – 311)Circle the letter of the correct answer.

1. The unit for the rate of current is the _____.

- a. ampere
b. volt
c. ohm
d. joule

2. All electrical devices contain electric _____.

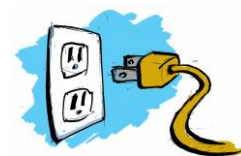
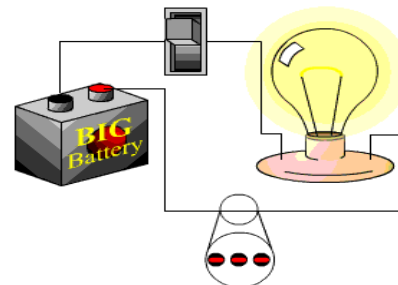
- a. acid
b. gears
c. circuits
d. motors

3. Potential electric current can be converted into _____.

- a. heat
b. matter
c. waste
d. food

4. Which of the following does not determine the resistance of a wire?

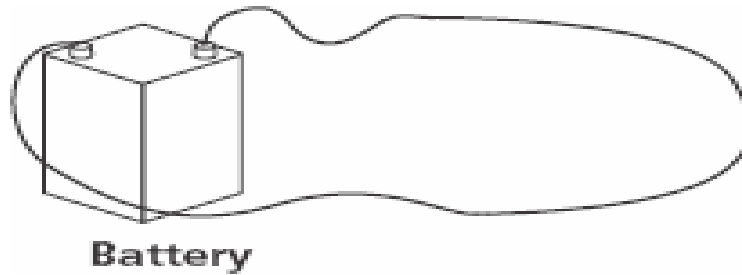
- a. temperature
b. diameter
c. length
d. color

Fill in the blank to complete each statement.

- The amount of charge that passes through a wire in a given period of time is the rate of electric _____.
- The electrons in conductors move about _____ freely than the electrons in insulators.
- Charges flow through wires because of differences in electric _____.
- _____ is the measure of how difficult it is for charges to flow through an object.
- _____ is the difference in electric potential energy per charge between two points in a circuit.
- Current flow is affected by the _____ of an object (such as the length of a wire) that the charge flows through.



Understanding Main Ideas: Study the diagram below, then answer the following questions in the spaces provided.



1. When the wires are connected to the terminals of the battery, what causes electric current in the circuit?

2. What is the voltage source and what is the conductor in this circuit?

3. What are two ways you could alter the wire to increase the resistance in the electric circuit?



Building Vocabulary: Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

- | | |
|---------------------------|---|
| _____ 1. electric current | a. the difference in electrical potential energy per charge between two points in a circuit |
| _____ 2. Insulator | b. material through which charge can easily flow |
| _____ 3. voltage | c. a complete, unbroken path through which electric charges can flow |
| _____ 4. resistance | d. the continuous flow of electric charges through a material |
| _____ 5. conductor | e. the measure of how difficult it is for charges to flow through a material |
| _____ 6. electric circuit | f. material through which charge cannot easily flow |

Name: _____

Date: ___/___/___

Lesson 3: Electric Circuits (use with pages 312 – 319)Circle the letter of the correct answer.

1. When more branches are added to a parallel circuit, _____.

- a. resistance increases
b. voltage increases

- c. resistance decreases
d. voltage decreases

2. Batteries and power plants are examples of _____.

- a. energy sources
b. energy conduction

- c. energy transformation
d. energy conservation

3. The path of current in a circuit is completed by _____.

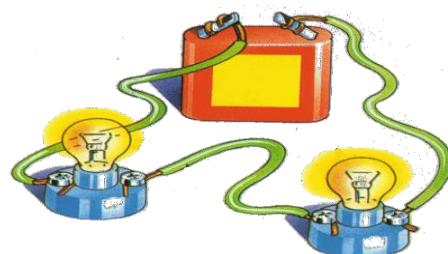
- a. a transformer
b. an energy source

- c. conducting wires
d. an electrical device

4. Resistance in a circuit is equal to voltage divided by _____.

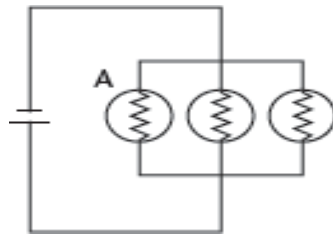
- a. joules
b. current

- c. power
d. amperage

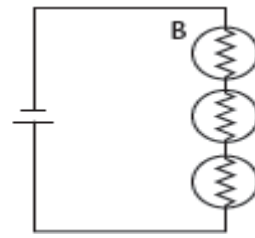
Modified True or False: If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true._____ 1. Electrical energy in a circuit gets transformed into other forms of energy, such as mechanical energy._____ 2. Isaac Newton formulated Ohm's law._____ 3. Opening a switch breaks an electric device._____ 4. All electric circuits have the same basic features._____ 5. Energy is always lost in a circuit._____ 6. Most conductors have a(n) inconstant resistance regardless of the applied voltage.



Each of the circuit diagrams below shows a battery and three light bulbs. Study the circuits and then answer the questions in the spaces provided.

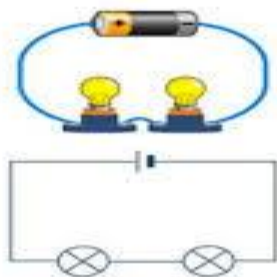


Circuit 1

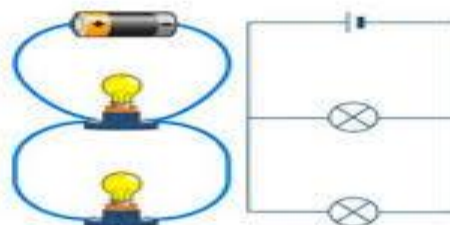


Circuit 2

1. Which circuit is a series circuit? _____
2. Which circuit is a parallel circuit? _____
3. If bulb A goes out, what happens to the light in the other two bulbs in that circuit? _____
4. If bulb B goes out, what happens to the light in the other two bulbs in that circuit? _____
5. If a fourth bulb is added similar to the existing bulbs in Circuit 1, what happens to the resistance in the circuit? _____
6. If a fourth bulb is added similar to the existing bulbs in Circuit 2, what happens to the resistance in the circuit? _____
7. How many paths can current take in Circuit 1? _____
8. How many paths can current take in Circuit 2? _____



Series Circuit



Parallel Circuit

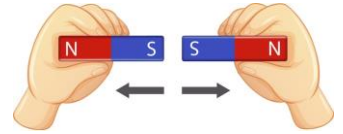
Name: _____

Date: ___/___/___

Lesson 1: What Is Magnetism (use with pages 336 – 339)



Circle the letter of the correct answer.



1. Two south magnetic poles brought near each other _____.
 - a. repel each other
 - b. attract each other
 - c. cancel each other
 - d. magnetize each other

2. A north magnetic pole brought near a south magnetic pole _____.
 - a. nullifies the south pole
 - b. attracts the south pole
 - c. repels the south pole
 - d. magnetizes the south pole

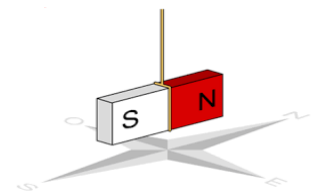
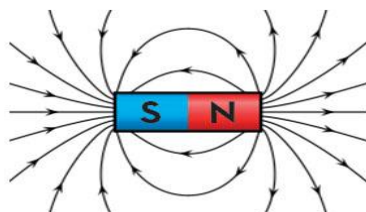
3. Two north magnetic poles brought near each other _____.
 - a. magnetize each other
 - b. attract each other
 - c. cancel each other
 - d. repel each other

4. A south magnetic pole brought near a north magnetic pole _____.
 - a. repels the north pole
 - b. attracts the north pole
 - c. nullifies the north pole
 - d. magnetizes the north pole



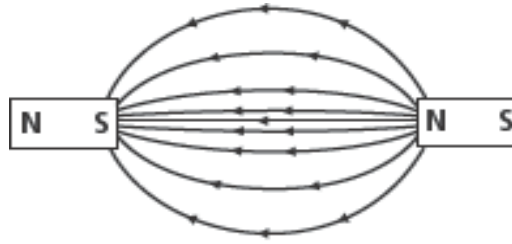
If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true.

- _____ 1. Any material that exerts magnetic force is considered a magnet.
- _____ 2. Like all other forces, a magnetic force is a(n) gravitational force.
- _____ 3. The area(s) between the poles of a magnet has the strongest effect.
- _____ 4. Magnets attract wood and materials that contain iron.
- _____ 5. When freely swinging, one end of a magnet always points east.
- _____ 6. Magnets have the same properties as sedimentary rocks.



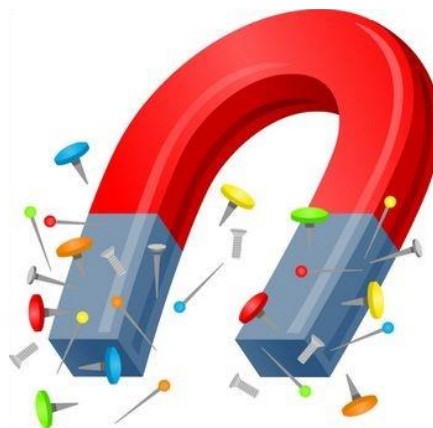


Understanding Main Ideas. The diagram below shows two magnets. Use the diagram to answer the questions below in the spaces provided.



1. Are these magnets attracting or repelling each other? How can you tell?

2. What would happen if the magnet on the left were turned around, so that its north pole faced the north pole of the other magnet?



Name: _____

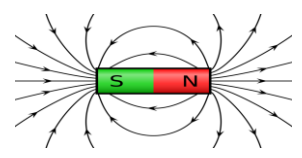
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Lesson 2: Magnetic Fields (use with pages 340-345)



Fill in the blank to complete each statement.

1. A(n) _____ is a device that has a magnetized needle that can spin freely.
2. _____ is the angle between geographic north and the north to which a compass needle points.
3. When the magnetic fields of two or more magnets overlap, a(n) _____ magnetic field forms.
4. Magnetic field lines are closest together at the _____.
5. The motion of liquid _____ in Earth's outer core creates a magnetic field.

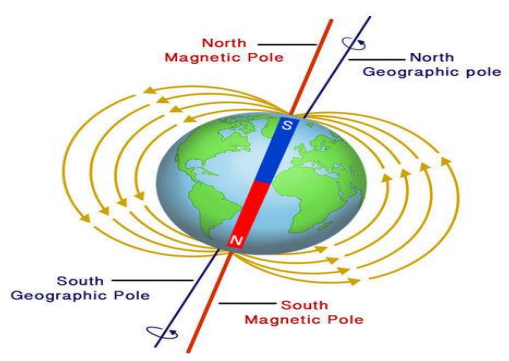


6. A compass behaves as it does because each needle acts as a(n) _____.



If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true.

1. Earth's magnetic poles are not in the same place as the geographic poles.
2. Magnets cannot interact without touching.
3. Magnetic field lines always cross.
4. The effects of a magnetic field can be observed using non-metal filings.





Understanding Main Ideas. Answer the following questions in the spaces provided.

1. In what ways are Earth and a bar magnet alike?

2. If you follow a compass pointing north, will you reach the geographic north pole? Explain your answer.

3. Draw a magnetic field around the illustration of the bar magnet shown here.



Name: _____

Date: ___/___/___

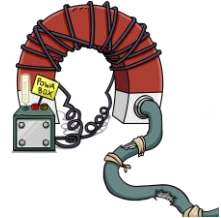
Lesson 3: Electromagnetic Forces (use with pages 346-351)



Circle the letter of the correct answer.

1. You can increase the strength of an electromagnet by _____.

- a. changing the position of the compass
- b. adjusting the magnetic declination
- c. using a stronger ferromagnetic material for the core
- d. reversing the magnetic domains

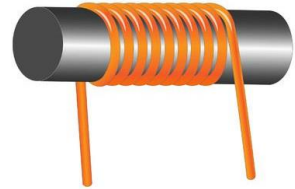


2. You can increase the strength of an electromagnet by _____.

- a. adding loops of wire
- b. decreasing the current in the solenoid
- c. winding the coils more loosely
- d. using direct current

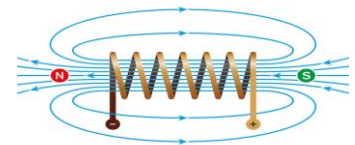
3. The north and south poles of a solenoid change with _____.

- a. the type of material in the core
- b. the number of loops in the coil
- c. the tightness of loops in the coil
- d. the direction of the current



4. Both solenoids and electromagnet produce magnetic fields using _____.

- a. electric current and coiled wires
- b. compasses and magnetic fields
- c. coiled wires and a ferromagnetic core
- d. electric current and a battery



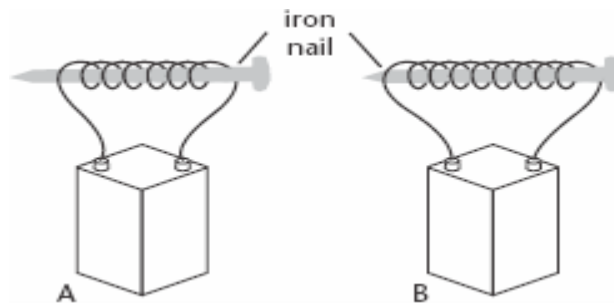
Fill in the blank to complete each statement.

1. _____ discovered that wherever there is electricity, there is magnetism.
2. An electric _____ produces a magnetic field.
3. There are _____ ways to change the strength of a magnetic field.

4. You can increase the strength of a magnetic field by increasing the amount of _____ in the wire.
5. To change the direction of a magnetic field, you reverse the direction of the _____.
6. _____ are used in electric motors, earphones, and in junkyards to lift old cars and other heavy steel objects.



Understanding Main Ideas. Use the illustration below to answer questions.



1. What kind of magnets is shown in the figure above?

2. Assuming the batteries are the same, which magnet do you think is stronger, A or B? Explain your answer.

3. List four factors that can be varied to change the strength of the magnets.
