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Instructions: Read pages 1, 2, and 3 about contact and noncontact forces. Then, answer all of the questions that follow.

Forces in Our World: Contact and Noncontact Forces

Have you ever dropped something and watched it fall to the ground? You might not see anything pulling it, but **gravitational force** (gravity) is working. Gravitational force is a **noncontact force**—it acts without touching. Forces are all around us and affect everything we do.

Some forces require touch. These are called **contact forces**, or **mechanical forces**. If you push a shopping cart or kick a soccer ball, your body makes contact with the object—that's how the force is transferred. Common contact forces include **applied force**, **friction**, **air resistance**, **elastic force**, and **normal force**.

Friction is one of the most familiar contact forces. It happens when two surfaces rub against each other and works against motion, causing objects to slow down or stop. For example, when you slide a book across a table, friction between the book and the surface makes it slow down. Without friction, things would slide out of control—even walking would be difficult!

Other forces work at a distance, like **gravitational force**, **magnetic force**, and **electric force**. These noncontact forces can seem almost magical. A magnet can pull a paperclip without touching it, and you might feel a shock from static electricity without seeing anything happen.

Contact and noncontact forces affect motion by changing how objects move. They can make things speed up, slow down, stop, or change direction. Understanding the difference between these types of forces helps us explain how objects move, fall, bounce, float, and interact with the world around them.

What Is a Force?

A **force** is a **push or a pull** on an object. Forces can change an object's speed, direction, or shape. You use force every day, whether you're kicking a ball, closing a door, or picking up your backpack.



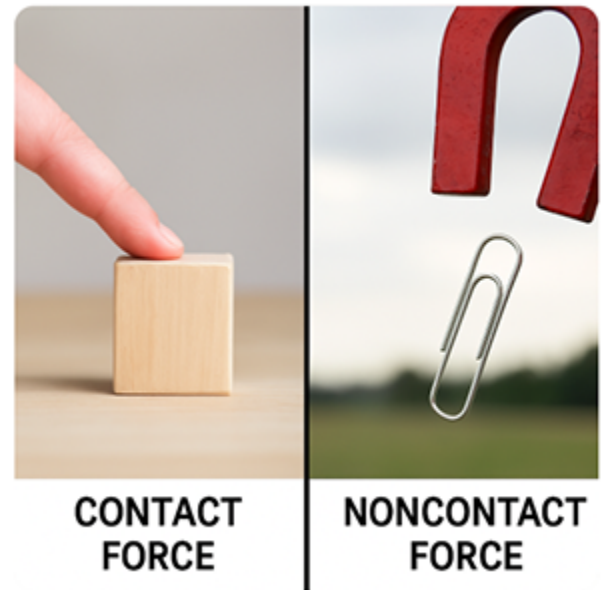
Types of Forces

Contact Forces (Mechanical Forces)

A **contact force**, also called a **mechanical force**, occurs when two objects physically touch each other. The force is transferred through direct contact.

Examples of contact forces include:

- **Applied force** – a force created when you push or pull an object
- **Friction** – a force that resists motion when two surfaces rub against each other
- **Air resistance** – a type of friction caused by air pushing against a moving object
- **Elastic force** – a force that happens when something is stretched or compressed, like a rubber band or spring
- **Normal force** – a supporting force from a surface that holds up an object, such as a table holding a book



Noncontact Forces

A **noncontact force** acts on an object from a distance, without any physical contact. These forces can pull or push objects even when they are not touching.

Examples of noncontact forces include:

- **Gravitational force** (gravity) – a force that pulls objects toward Earth or other large bodies in space
- **Magnetic force** (magnetism) – a force that attracts or repels certain materials, like iron or steel, without touching them
- **Electric force** (static electricity) – a force caused by electric charges that can attract or repel objects, like static electricity making hair stand up

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Vocabulary

Below are key terms from the reading that will help you understand contact and noncontact forces:

Term	Definition
Force	A push or a pull that can change how something moves. (It can change an object's speed, direction, or shape.)
Contact Force	A force that occurs when two objects physically touch. (Also called a mechanical force.)
Noncontact Force	A force that acts at a distance, without physical contact.
Gravitational Force	A force that pulls objects toward each other, especially toward Earth. (This is what we often call gravity .)
Magnetic Force	A force that pushes or pulls certain materials like iron or steel without touching them. (This is the force behind magnetism .)
Electric Force	A force that pushes or pulls objects because of electric charges. (This includes static electricity .)
Friction	A force that resists motion when two surfaces rub against each other. (Friction slows down or stops moving objects.)
Air Resistance	A type of friction that pushes against objects moving through air, slowing them down.
Elastic Force	A force that pushes or pulls when something is stretched or squeezed, like a spring or rubber band.
Normal Force	A supporting force from a surface that pushes up on an object, like a table holding a book.

Comprehension Questions

Part 1: Multiple Choice (Circle the correct answer)

1. What is a force?

- a) Something you see
- b) A type of tool
- c) A push or a pull
- d) A type of magnet

2. Which of the following is a noncontact force?

- a) Friction
- b) Lifting a box
- c) Air resistance
- d) Gravitational force

3. Which force helps slow down a moving bicycle?

- a) Magnetic force
- b) Gravitational force
- c) Friction
- d) Electric force

4. What type of force is used when you throw a baseball?

- a) Noncontact force
- b) Contact force (Mechanical)
- c) Magnetic force
- d) Electric force

5. Which noncontact force pushes or pulls materials like iron or steel?

- a) Friction
- b) Electric force
- c) Magnetic force
- d) Air resistance

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Part 2: Short Answer

6. Name two examples of contact (mechanical) forces:

→ _____

7. Name two examples of noncontact forces:

→ _____

8. What does friction do when two surfaces rub together?

→ _____

9. Why is gravitational force (gravity) considered a noncontact force?

→ _____

10. How do contact and noncontact forces affect the way objects move?

→ _____

11. What would happen if there were no gravitational force acting on a falling object?

→ _____

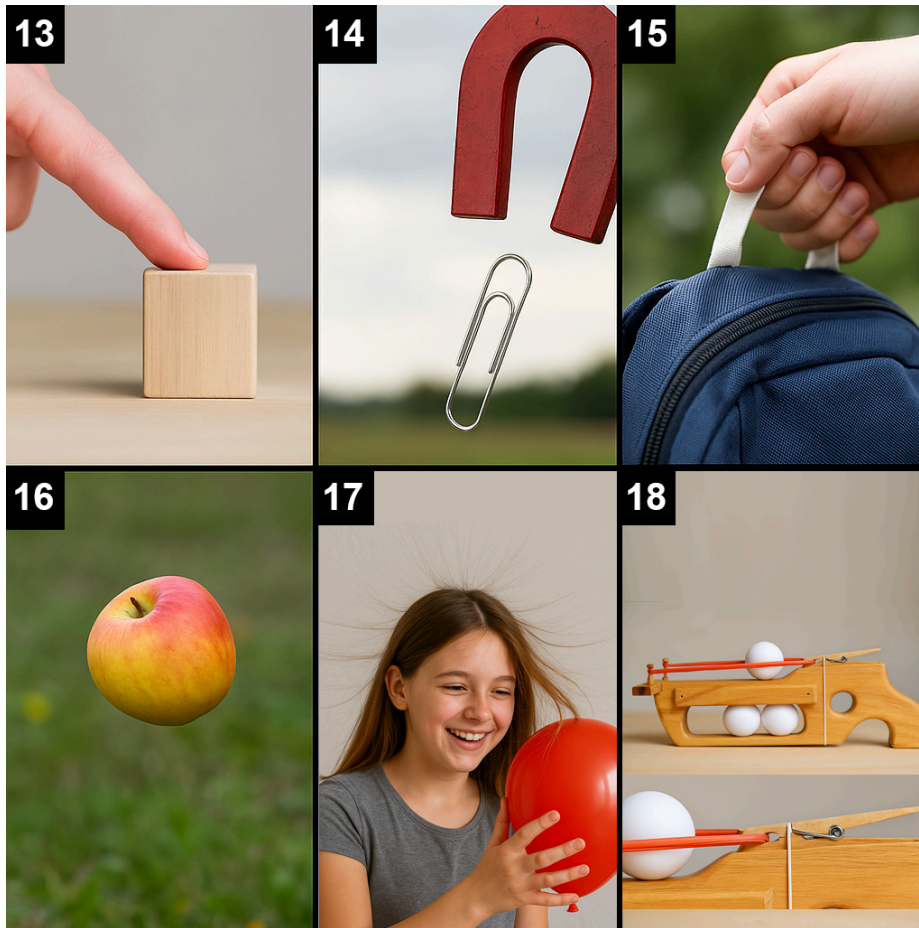
12. How does air resistance affect the motion of a moving object? Explain your answer with an example.

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Observe and Apply What You Know



Directions: Observe the numbered images. Write the type of force you observe (**contact** or **noncontact**). Explain your answer.

13. Type of force: _____ Explanation: _____

14. Type of force: _____ Explanation: _____

15. Type of force: _____ Explanation: _____

16. Type of force: _____ Explanation: _____

17. Type of force: _____ Explanation: _____

18. Type of force: _____ Explanation: _____

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Challenge Questions

Directions: Show what you've learned! Answer each question in complete sentences. Use science words like *force*, *gravitational force*, *friction*, and *motion* when they apply, and explain your thinking clearly.

(a) How would the skier's motion change if air resistance and friction were completely removed?

(b) Based on the previous question, would the skier still come back down to Earth? Explain why or why not.

(c) After the skier lands, what forces help them slow down or stay balanced? Explain.



Force – Answer Key

Part 1: Multiple Choice

1. C
2. D
3. C
4. B
5. C

Part 2: Short Answer

6. **Contact forces (any two):** applied force, friction, air resistance, elastic force, normal force
7. **Noncontact forces (any two):** gravitational force, magnetic force, electric force
8. **Friction:** It resists or slows motion between surfaces.
9. **Gravitational force:** It pulls objects without touching them.
10. **Effect on motion:** Contact and noncontact forces change an object's speed or direction by pushing or pulling.
11. **Without gravitational force:** The object would not fall; it would float or keep moving in a straight line.
12. **Air resistance:** It slows objects moving through air (e.g., a parachute slows a skydiver).

Observe and Apply (sample answers)

13. **Contact force.** The finger is touching the block, applying an applied force.
14. **Noncontact force.** The magnet pulls the paperclip via magnetic force.
15. **Contact force.** The hand's applied/tension force counters gravitational force on the backpack.
16. **Noncontact force.** The apple falls because of gravitational force.
17. **Noncontact force.** The girl's hair moves due to electric force acting at a distance.
18. **Contact force.** The stretched rubber band uses elastic force to launch the ball.

Challenge (sample answers)

- (a) Without air resistance or friction, the skier would keep moving at the same speed and would not slow down.
- (b) Yes. The skier would still fall back to Earth because gravitational force is still acting downward.
- (c) Friction between skis and snow slows the skier, and the normal force from the ground supports the skier's weight and helps with balance.



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