

Forces From Afar

Ask questions about pushes and pulls without touch.

3-PS2-3 "Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Circle every question the scientists ask. Underline the words or sentences that show what changed and what happened, so you can link a cause to an effect.

Testing Invisible Forces

- ① During science time, Inez held a rubbed balloon near tiny paper squares. She did not let the balloon touch them. Some squares lifted and moved toward the balloon. "What made the paper move?" Inez asked. Her group knew that rubbing the balloon gave it static electric charge. The charged balloon pulled on the paper from a short distance away.
- ② Next, the group tested two bar magnets. With one end of each magnet facing, the magnets pulled together. When Inez turned one magnet around, the magnets pushed apart. "How does turning a magnet change its motion?" she asked. The magnets could pull or push without touching. Their direction depended on which ends faced each other.
- ③ The class also used magnets to pick up steel paperclips. "What happens if a magnet is farther from a paperclip?" Mateo asked. The group found that a nearby magnet pulled more strongly than a farther magnet. Then they placed two magnets together and tested again. "Does using two magnets change the pull?" They observed that two magnets could pull more paperclips than one magnet.

2 ANSWER WITH EVIDENCE Use the passage

1 What caused the paper squares to move toward the balloon?

2 How did turning one magnet affect the two magnets?

3 What question did Mateo ask about a magnet and a paperclip?

4 What observation showed that using two magnets changed the pull?

3 YOUR TURN Your own words

Choose a rubbed plastic comb and tissue pieces, or a magnet and a steel washer. Write one testable question about changing distance, then write a prediction that tells the cause and effect.

PART 1 • READ AND MARK

Circle every question the scientists ask. Underline the words or sentences that show what changed and what happened, so you can link a cause to an effect. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What caused the paper squares to move toward the balloon?	Rubbing gave the balloon static electric charge, and the charged balloon pulled the paper squares.
2	How did turning one magnet affect the two magnets?	They changed from pulling together to pushing apart.
3	What question did Mateo ask about a magnet and a paperclip?	"What happens if a magnet is farther from a paperclip?"
4	What observation showed that using two magnets changed the pull?	Two magnets could pull more paperclips than one magnet.

PART 3 • YOUR TURN (SAMPLE ANSWER)

How does the distance between a charged plastic comb and tissue pieces affect their motion? If the comb is closer, the tissue pieces will move toward it more easily because the electric pull is stronger at a shorter distance.

Accept a question that changes the distance between two objects that do not touch. The prediction should state an expected effect, such as a stronger pull when the objects are closer, and should connect that effect to the changed distance.