Puck Path Test

Investigate how sideways forces change motion

P.5.6.4 "Plan and conduct scientific investigations to test the effects of balanced and unbalanced forces on the speed and/or direction of objects in motion."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline what Mina keeps the same, circle each fan setup, and number the two crossing results to show how she tests the puck's direction.

Which Way Will the Puck Go?

1. At the school science fair, Mina wants to learn how sideways forces affect a moving air-hockey puck. The puck glides across an air table, where very little friction slows it. A spring launcher sends the puck forward from the same starting line each time. Mina watches where it crosses a strip of tape at the far end of the table.

2. Mina places one small fan on each side of the puck's path. The left fan blows right, and the right fan blows left. She sets both fans to the same strength and starts them before launching the puck. With equal pushes from opposite sides, the sideways forces balance. The puck moves forward and crosses the far tape near the center.

3. Next, Mina turns off the right fan but leaves the left fan at the same setting. The left fan now gives an unbalanced push to the right. The puck crosses the far tape right of center. For a fair comparison, Mina uses the same puck, launcher setting, starting line, and fan positions in both setups. She repeats each setup three times.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which two fan setups should Mina compare to test whether balanced and unbalanced sideways forces change the puck's direction?

2. Name two things Mina keeps the same so she can link a change in the puck's path to the fan setup.

3. Where does Mina check the puck in each setup, and what difference does she find?

4. Suppose a puck crosses left of center during a repeat. What should Mina check before deciding the fan setup caused that result?

3 YOUR TURN

Your own words

A toy car has a small fan attached that can blow air backward and push the car forward. Plan a fair test of whether turning on the fan changes the car's speed while it rolls. Describe both setups, how you will keep the starts and fan-on runs consistent, how you will measure speed, and how you will repeat the test.

ANSWER KEY

Puck Path Test

GRADE 5 · P.5.6.4

PART 1 · READ AND MARK

Underline what Mina keeps the same, circle each fan setup, and number the two crossing results to show how she tests the puck's direction. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which two fan setups should Mina compare to test whether balanced and unbalanced sideways forces change the puck's direction?	**Compare both fans blowing at equal strength with only the left fan blowing.**
2	Name two things Mina keeps the same so she can link a change in the puck's path to the fan setup.	**Accept any two: the puck, launcher setting, starting line, or fan positions.**
3	Where does Mina check the puck in each setup, and what difference does she find?	**She checks where it crosses the far tape. It crosses near the center with balanced sideways forces and right of center with an unbalanced push.**
4	Suppose a puck crosses left of center during a repeat. What should Mina check before deciding the fan setup caused that result?	**She should check that a part of the planned setup, such as the starting line, launcher setting, or fan settings, did not change by mistake.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I will release the same car from the same point on a ramp and time it between two marks on the level floor. In one setup the fan stays off; in the other I turn it on at the first mark, using the same fan setting each time. I will keep the ramp and distance between marks the same and repeat each setup three times. I will compare the times for that distance because a shorter time means a greater average speed.

Accept other fair-test plans that change the fan's forward push while controlling the car's starting motion and using a consistent fan setting. Students should measure speed over the same distance and repeat both setups.