

# Push Test Plans

Design a fair test of how force affects motion.

**5.7.B** “design a simple experimental investigation that tests the effect of force on an object in a system such as a car on a ramp or a balloon rocket on a string.”

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## 1 READ AND MARK \_\_\_\_\_ Read it twice

**YOUR JOB** Underline Jalen's testable question. Circle the factor he changes, then number three conditions he keeps the same so the test is fair.

### Testing a Car Push

- ① Jalen wants to test how the strength of a push affects a toy car rolling on a ramp. His testable question is, “How does the push force at the top of the ramp affect the distance the car rolls on the floor?” He chooses distance rolled as the result he will measure. A meterstick will help him measure each trial in centimeters.
- ② To make the test fair, Jalen keeps important conditions the same. He uses the same car, ramp height, starting spot, floor surface, and release direction each time. He changes only the push force. He can use a spring scale to give three planned pushes, 1 newton, 2 newtons, and 3 newtons. A larger number of newtons means a stronger push.
- ③ For each force, Jalen completes three trials and records all three distances in a data table. Then he finds the average distance for each force and compares the averages. Repeating trials helps him notice an unusual result and makes his conclusion more dependable. His conclusion should state whether stronger pushes caused the car to roll farther, based on his measured averages.

**2 ANSWER WITH EVIDENCE** \_\_\_\_\_ Use the passage

**1** What testable question does Jalen investigate?

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**2** What factor does Jalen change on purpose?

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**3** Name three conditions Jalen keeps the same to make his test fair.

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**4** What should Jalen do with his three trial distances for each force before making a conclusion?

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**3 YOUR TURN** \_\_\_\_\_ Your own words

Design a simple balloon rocket investigation. Write a testable question, name the force you will change and the result you will measure, list two conditions you will keep the same, and tell how you will repeat and compare your trials.

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**PART 1 • READ AND MARK**

Underline Jalen's testable question. Circle the factor he changes, then number three conditions he keeps the same so the test is fair. Accept any marking that follows this job and points at the right text.

**PART 2 • ANSWERS**

| # | QUESTION                                                                                       | ANSWER                                                                                                |
|---|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1 | What testable question does Jalen investigate?                                                 | <b>How does the push force at the top of the ramp affect the distance the car rolls on the floor?</b> |
| 2 | What factor does Jalen change on purpose?                                                      | <b>The push force, measured in newtons.</b>                                                           |
| 3 | Name three conditions Jalen keeps the same to make his test fair.                              | <b>Any three: the car, ramp height, starting spot, floor surface, or release direction.</b>           |
| 4 | What should Jalen do with his three trial distances for each force before making a conclusion? | <b>He should find the average distance for each force and compare the averages.</b>                   |

**PART 3 • YOUR TURN (SAMPLE ANSWER)**

My question is, "How does the amount of air in a balloon rocket affect the distance it travels along a string?" I will change the amount of air, which changes the push from escaping air, and measure distance traveled in centimeters. I will keep the same balloon and string length. I will complete three trials for each amount of air, find the average distance, and compare the averages.

Accept another safe system if the student identifies one changed force, one measured result, at least two controlled conditions, and repeated trials. The force may be described operationally, such as different amounts of air in a balloon rocket.