

Model, Test, Revise

Use evidence to improve a model and explain a result.

6.1.e.ii "developing and using models use, develop, and revise models to predict and explain phenomena"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each whole sentence that tells what a model includes or leaves out. Circle each whole sentence that states a prediction, and box each whole sentence that describes a revision to the model.

Testing a Paper Parachute

- ① Engineers sometimes use a small model to investigate a large event. A class wanted to explain why a parachute can slow a falling supply package. They built a model with one metal washer as the package, four equal strings, and a circular paper canopy. The model left out wind and used the same drop height each time. Their first prediction was that a wider canopy would make the washer reach the floor more slowly because it pushes against more air.
- ② During trials, students changed only canopy width and timed the fall. The wider canopy usually took longer, so the model's prediction matched the pattern. Yet one wide canopy fell quickly when a string came loose. The first model had treated all strings as equal and securely attached. Students revised it by adding a check for string length and attachment. Their revised model predicted that a parachute with a loose or uneven string could tip, fall faster, and give a less reliable time.
- ③ The class then used the revised model before testing a new canopy. It had a wider paper circle and four securely taped strings of equal length. The model predicted a slower, steadier fall than the small canopy. When the result agreed, the class could explain that the broad canopy met more air while balanced strings helped it stay open. A model is useful even when it is not perfect. Its limits help investigators decide which features to test, keep, or revise.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What did the first parachute model include, and what condition did it leave out?

2 What did the first model predict would happen when the canopy was wider?

3 What observation showed that the first model needed revision? What did students add to the revised model?

4 How did the result with the new canopy support the class's explanation?

3 YOUR TURN _____ Your own words

Choose a question about how quickly an ice cube melts. In Panel 1, draw a simple comparison model and write a prediction; in Panel 2, label an unexpected result, redraw the model with one useful change, and write a revised prediction.

PART 1 • READ AND MARK

Underline each whole sentence that tells what a model includes or leaves out. Circle each whole sentence that states a prediction, and box each whole sentence that describes a revision to the model. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What did the first parachute model include, and what condition did it leave out?	It included a metal washer, four equal strings, and a circular paper canopy. It left out wind.
2	What did the first model predict would happen when the canopy was wider?	It predicted that the washer would reach the floor more slowly because the wider canopy pushes against more air.
3	What observation showed that the first model needed revision? What did students add to the revised model?	A wide canopy fell quickly when a string came loose. Students added a check for string length and attachment.
4	How did the result with the new canopy support the class's explanation?	The new canopy had a slower, steadier fall, as predicted. This supported the explanation that a broad canopy meets more air and balanced strings help it stay open.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: I drew equal ice cubes on a metal tray and a plastic tray. My prediction was that the ice cube on the metal tray would melt faster because metal transfers thermal energy more readily. Panel 2: One ice cube was larger, so I revised the model to show equal-size cubes on trays in the same room. My revised prediction was that, with equal-size cubes under the same conditions, the ice cube on the metal tray will melt faster.

Accept equivalent descriptions of the model features, evidence, revision, prediction, and explanation from the passage. For Your Turn, accept any sensible melting comparison that includes an initial model and prediction, an unexpected result, a model change, and an explicit revised prediction.