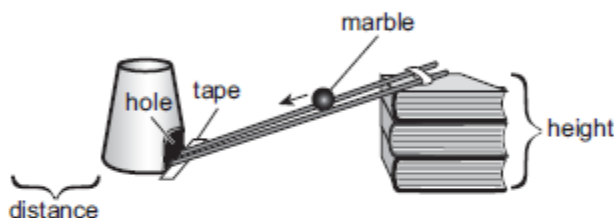


Marble Experiment

Savannah sets up an experiment with a marble, a foam cup, and a ramp. The cup has a hole on the side. The marble rolls down the ramp and pushes the cup. Savannah's experiment setup is shown in Figure 1.

Figure 1. Marble Experiment Setup

Savannah measures the distance that the cup moves when the marble pushes it. Next she changes the height of the ramp and repeats the experiment. She completes three trials. Her observations are shown in Table 1.

Table 1. Experimental Data

Experiment	Ramp Height (centimeters)	Time (seconds)	Distance the Cup Moves (centimeters)
1	10	1.8	2.5
2	20	1.5	3.0
3	30	1.3	5.0

9. Use the information in Table 1 to answer the question.

Savannah concludes that in each experiment, the marble hit the cup with a different amount of energy.

Which evidence **best** supports her conclusion?

- ☐ Ⓐ the height of the ramp in each experiment
- ☐ Ⓑ the time the marble took to reach the cup in each experiment
- ☐ Ⓒ the mass of the marble used in the experiments
- ☐ Ⓓ the distance that the cup moved in each experiment

10. Use the information in Table 1 to answer the question.

Which statement **best** explains why the marble had a different amount of energy in each experiment?

- ☐ Ⓐ The marble started with different speeds.
- ☐ Ⓑ The times it took for the marble to hit the cup were different.
- ☐ Ⓒ The marble had a different speed each time it hit the cup.
- ☐ Ⓓ The cup moved a different distance each time the marble hit it.

11. Part A

Which question was Savannah most likely trying to answer by completing this experiment?

- ☐ Ⓐ How does the height of the ramp affect the mass of the marble?
- ☐ Ⓑ How does the height of the ramp affect the energy of the marble?
- ☐ Ⓒ How does the height of the ramp affect the time the marble rolls before stopping?
- ☐ Ⓓ How does the height of the ramp affect the distance the marble rolls before stopping?

Part B

Which statement correctly predicts the answer to Savannah's question in Part A?

- ☐ Ⓐ When the height of the ramp is decreased, the time the marble will roll before stopping increases.
- ☐ Ⓑ When the height of the ramp is increased, the marble will not roll as far before stopping.
- ☐ Ⓒ When the height of the ramp is increased, the speed of the marble will increase.
- ☐ Ⓓ When the height of the ramp is decreased, the mass of the marble will decrease.

- 12.** Describe the changes in energy that occur when the marble hits the cup. Be sure to use evidence from the experiment in your explanation.
