

Finalizing Friction Quiz Teacher Key

Short Answer Instructions: Answer the following questions in complete sentences.

1. What conditions had the shortest stopping distance? Why?

The BMW with completely dry pavement theoretically has the shortest stopping distance.

2. What are some factors that could have caused errors in your data during the simulation?

Reaction time, how hard the brake is being pressed, not traveling in a straight line should be the most common answers.

Multiple Choice Instructions: Circle the correct answer and use the space provided to explain your answer.

3. Which of the following is an example of increasing friction? Briefly explain your answer.
 - a. Squirting oil into door hinges
 - b. Spreading sand on icy roads
 - c. Waxing a snowboard

Answers B should be circled. Explanations may vary. B: Spreading sand on icy roads.

The sand will increase surface friction by creating a courser surface.

4. Which of the following is NOT an example of friction? Briefly explain your answer.

- a. A baseball traveling through the air
- b. A box sitting on a flat table
- c. A boat floating across a lake

Answer B should be circled. Explanations may vary. B: The only force acting on the box is gravity and friction requires two objects to be sliding past one another or trying to.

Further Your Thinking: Use the equation below to answer the questions.

$$F = m \times a$$

5. A car starts out traveling at 22.4 m/s (about 50 mph) and has a mass of 2722 kilograms. The driver sees a deer in the distance and slams on the brakes causing a force of 1500 newtons. Using the equation provided, what is the acceleration of the vehicle?

Answer: 0.55 m/s²

6. What does this acceleration mean?

This means that every second the vehicle will be slowing down by 0.55 meters per second,
until the vehicle comes to a complete stop.
