

# LAB 17

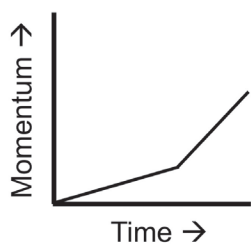
## Checkout Questions

### Lab 17. Impulse and Momentum: How Does Changing the Magnitude and Duration of a Force Acting on an Object Affect the Momentum of That Object?

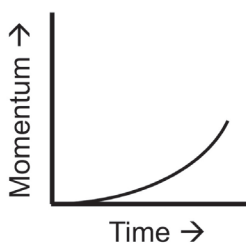
1. How can the shape of a force versus time graph be used to determine an object's momentum?

Use the following information to answer questions 2–4. Consider a cart starting from rest with a fan attachment that applies a constant force. Assume that there is no friction acting on the cart as it moves.

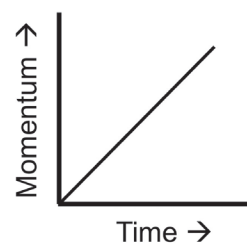
2. What would the momentum versus time graph look like if the fan force doubled halfway through the trial?



A



B



C

- a. Graph A
- b. Graph B
- c. Graph C

How do you know?

### *How Does Changing the Magnitude and Duration of a Force Acting on an Object Affect the Momentum of That Object?*

3. What could cause the slope to become zero?
  - a. Doubling the fan force a second time
  - b. Turning the fan off
  - c. Leaving the fan as is

How do you know?

4. Draw a momentum versus time graph showing the change in momentum if the fan stayed on for twice as long.

Why did you draw your momentum versus time graph like that?

5. There is a difference between a scientific law and a scientific theory.
  - a. I agree with this statement.
  - b. I disagree with this statement.

Explain your answer, using an example from your investigation about impulse and momentum.

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6. There is a difference between data and evidence in science.
  - a. I agree with this statement.
  - b. I disagree with this statement.

Explain your answer, using an example from your investigation about impulse and momentum.

7. In physics, it is important to classify something as either a vector quantity or a scalar quantity. Explain what a vector is and why it is important to identify vector quantities in physics, using an example from your investigation about impulse and momentum.
  
8. Scientists often need to track how energy or matter moves into, out of, or within a system during an investigation. Explain why tracking energy and matter is such an important part of science, using an example from your investigation about impulse and momentum.

# Application Labs