

**PHYSICS Quiz 6-A**

Physics 1A

Forces Unit

Name\_\_\_\_\_

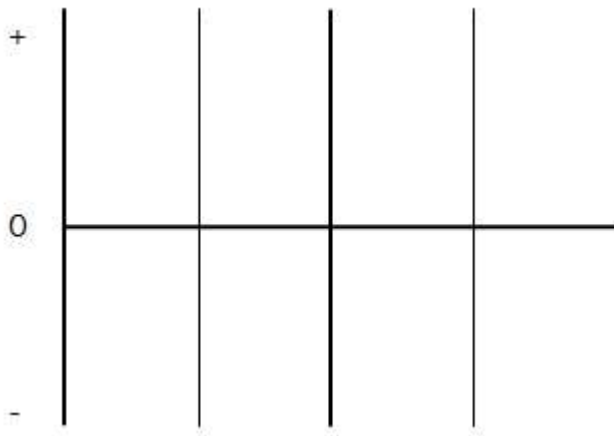
Date\_\_\_\_\_Hour\_\_\_\_\_

**LEARNING OBJECTIVES ASSESSED:**

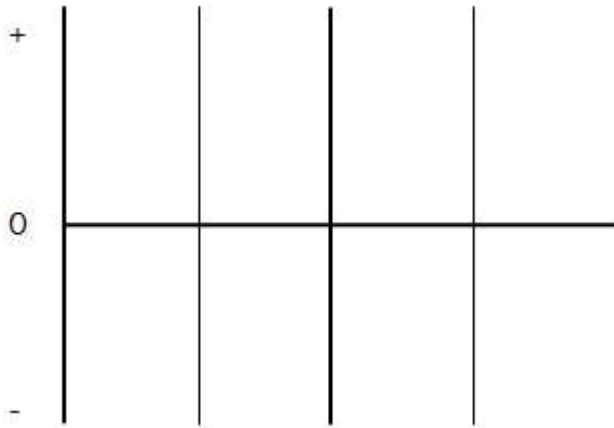
- \_\_\_\_\_ **DA.8** I can thoroughly justify my mathematical claims by showing all necessary work, including stating foundational mathematical relationships, showing calculations, etc.
- \_\_\_\_\_ **F.17** I can solve problems using conservation of momentum.
- \_\_\_\_\_ **F.18** I can draw and analyze momentum bar charts for 1-D interactions.
- \_\_\_\_\_ **F.21** I can explain interactions between objects in terms of conservation of momentum.

**DIRECTIONS:** Justify all claims by showing all of your work. **DA.8**

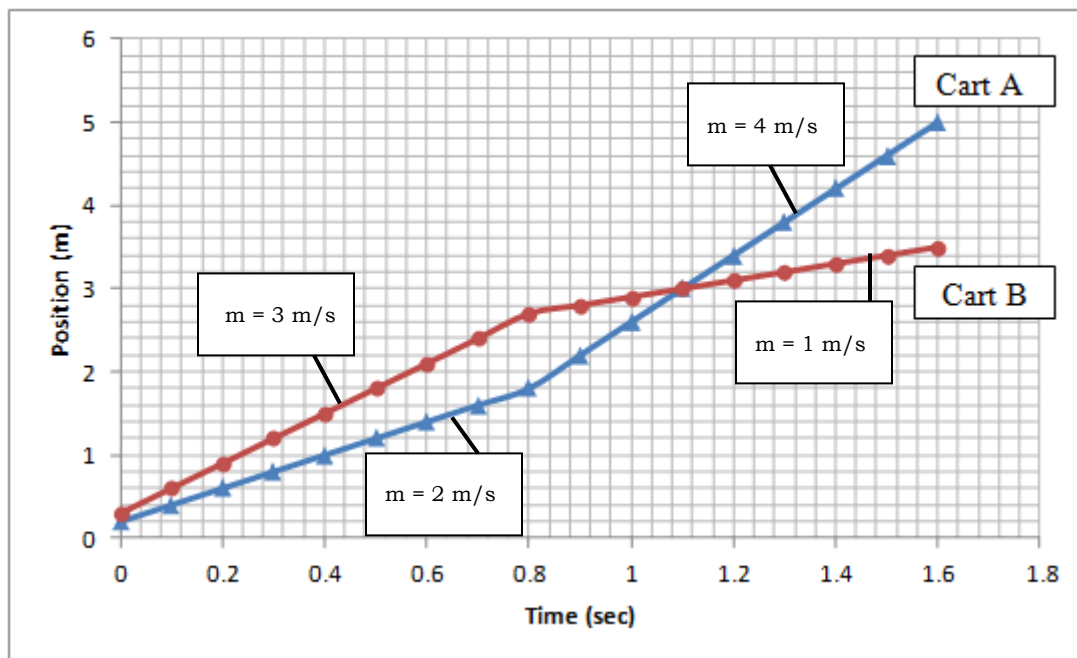
1. A 5 kg ball is rolling to the right at 4 m/s towards a 2 kg Pasco cart, which is heading left at 6 m/s. After the collision, the ball travels back to the left at 2 m/s. With what speed and in what direction does the Pasco cart move off at *after* the collision? Set up a conservation of momentum equation to solve for, and complete the Bar Graph below to support your claim. **F.17, F.18**



2. In a ballistics test, a gun shoots a 2 kg potato into a stationary 5 kg catching cart. The cart recoils at 3.7 m/s after catching the potato, therefore *sticking together*. Determine the initial speed of the potato. Set up a conservation of momentum equation to solve for, and complete the Bar Graph below to support your claim.  
**F.17, F.18**



3. Use the graph below to answer the following questions.



The position-time graph shown above displays the motion of two frictionless carts that collide and *bounce off* of each other. Cart A and Cart B have equivalent masses of 2 kg. *The signs of the slopes are correct and do not need to be adjusted as we did in the lab.* **F.21**

- A. What type of collision is this? Parked, Rear-End or Head-On? Justify your answer.

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- B. When does the collision occur? \_\_\_\_\_ How can you tell?

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- C. Use the graph and the information about the masses to determine if the collision supports the Law of Conservation of Momentum. Justify. (Use the space below the lines for any necessary calculations).

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