Name ______________________________ Date __________

CONCEPTUAL **Physics** PRACTICE PAGE

Chapter 6 Momentum
Changing Momentum

1. A moving car has momentum. If it moves twice as fast, its momentum is

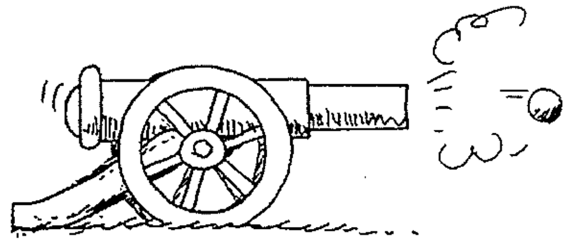
   __________ as much.

2. Two cars, one twice as heavy as the other, move down a hill at the same speed. Compared to the lighter car, the momentum of the heavier car is __________ as much.

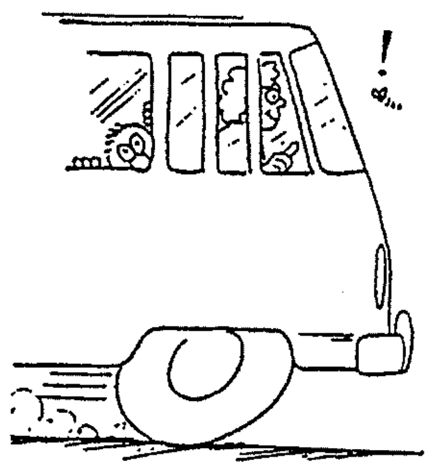
3. The recoil momentum of a cannon that kicks is

   [more than] [less than] [the same as]

   the momentum of the cannonball it fires. (Here we neglect friction and the momentum of the gases.)



4. Suppose you are traveling in a bus at highway speed on a nice summer day and the momentum of an unlucky bug is suddenly changed as it splatters onto the windshield.



   a. Compared to the force that acts on the bug, how much force acts on the bus?

   [More] [Less] [The same]

   b. The time of impact is the same for both the bug and the bus. Compared to the impulse on the bug, this means the impulse on the bus is

   [more] [less] [the same].

   c. Although the momentum of the bus is very large compared to the momentum of the bug, the *change* in momentum of the bus, compared to the *change* of momentum of the bug is

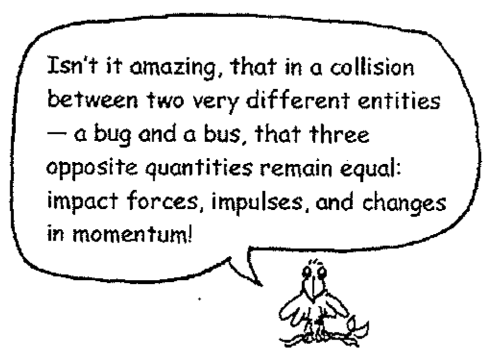
   [more] [less] [the same].

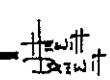
   d. Which undergoes the greater acceleration?

   [Bus] [Both the same] [Bug]

   e. Which therefore, suffers the greater damage?

   [Bus] [Both the same] [The bug of course!]



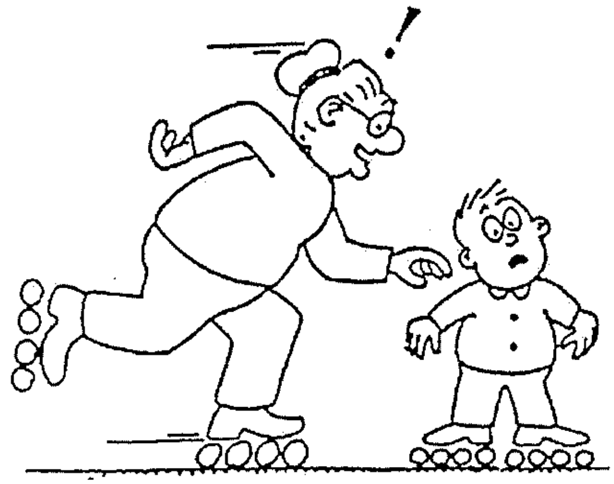


Chapter 6 Momentum
Changing Momentum—continued

5. Granny whizzes around the rink and is suddenly confronted with Ambrose at rest directly in her path. Rather than knock him over, she picks him up and continues in motion without "braking."

   Consider both Granny and Ambrose as two parts of one system. Since no outside forces act on the system, the momentum of the system before collision equals the momentum of the system after collision.

   a. Complete the before-collision data in the table below.



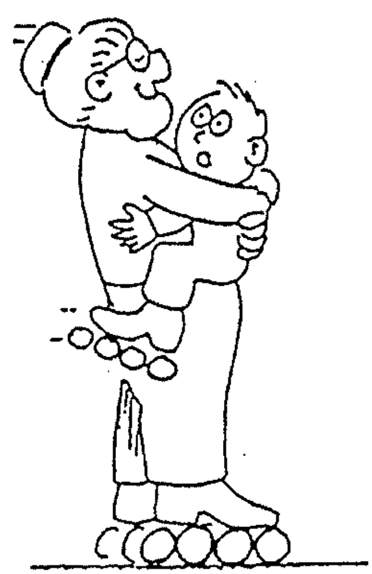
BEFORE COLLISION	
Granny's mass	80 kg
Granny's speed	3 m/s
Granny's momentum	______
Ambrose's mass	40 kg
Ambrose's speed	0 m/s
Ambrose's momentum	______
Total momentum	______

   b. After collision, Granny's speed [increases] [decreases].

   c. After collision, Ambrose's speed [increases] [decreases].

   d. After collision, the total mass of Granny + Ambrose is __________.

   e. After collision, the total momentum of Granny + Ambrose is __________.



   f. Use the conservation of momentum law to find the speed of Granny and Ambrose together after collision. (Show your work in the space below.)

   New speed __________

Hewitt Drew it!