CONCEPTUAL PHYSICAL SCIENCE EXPLORATIONS

Chapter 5 Momentum

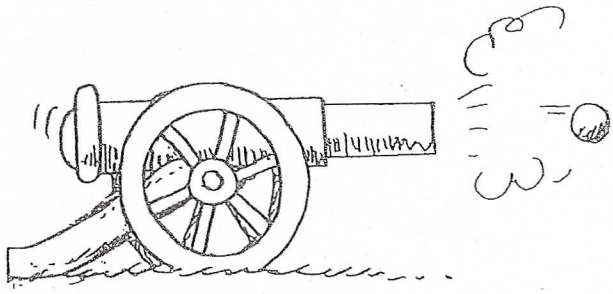
Changing Momentum

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 with 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 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 front window.

   a. Compared to the force that acts on the bug, how much force acts on the bus?
      (more) (the same) (less)

   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) (the same) (less)

   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) (the same) (less)

   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!)