

CONCEPTUAL **Physical Science** PRACTICE SHEET

Chapter 3: Momentum and Energy

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 gun that kicks is (more than) (less than) (the same as) the momentum of the gases and bullet it fires.
4. If a man firmly holds a gun when fired, then the momentum of the bullet and expelled gases is equal to the recoil momentum of the (gun alone) (gun-man system) (man alone).
5. 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!)

