

# Chapter C3: Momentum Transfer, Impulse, Force Practice

## Physics I

College of the Atlantic

1. During a “sufficiently short” time interval of 0.25 s, a bird moves a displacement of 4.0 m east, 1.0 m south, and 0.1 m downward. What are the components of the bird’s velocity at this time in a reference frame in standard orientation on the earth’s surface? What is the bird’s speed?
2. A 3 kg cart moving at 4 m/s to the right hits a 10 kg cart that is at rest. After the collision, the 3 kg cart is moving to the left at 1 m/s.
  - (a) How much momentum does the left cart transfer to the right cart?
  - (b) What is the velocity of the right cart after the collision?
  - (c) Draw an arrow diagram similar to that on the upper right of page 49.
3. A 3 kg box of tofu sits on a table.
  - (a) What is the mass of the box?
  - (b) What is the magnitude of the weight of the box?
  - (c) Over a time interval of one second, what is the magnitude of the impulse the box receives as a result of the gravitational interaction?
  - (d) What is the magnitude of the force exerted on the box as a result of the gravitational interaction?
  - (e) What is the magnitude of the force that the table exerts on the box?
  - (f) Over a time interval of two seconds, what is the magnitude of the impulse the box receives from the table?
  - (g) Over a time interval of two seconds, what is the magnitude of the impulse the box receives from the gravitational interaction?