

Planet Holloway **websheet 6.2**

AP Physics C - Chapter 6 momentum

You may print this out and write on it or work on your own paper.

Show all work.

1. A pumpkin launcher shoots out a 9 kg pumpkin at 30 m/s at 35° above horizontal. If the pumpkin launcher has a mass of 400 kg and is free to move, what is its horizontal recoil speed?
2. A 1000 kg truck is placed in neutral and Pedro begins to throw mini marshmallows out the back at a speed of 60 m/s. If the marshmallows are 5 g each, how many marshmallows need to be thrown out the back to get the truck to 0.8 m/s forward?
3. A 40 g dart is thrown at 25 m/s at a 6 kg watermelon at rest on a frictionless table. What speed does the watermelon move at if the dart embeds in it?
4. A 100 kg table is at rest on ice. If Cindy Lou Who (15 kg) were to dive onto the table at a speed of 20 m/s and slid across and off the table, leaving at a speed of 14 m/s, what is the final speed of the table?
5. A solid 20 kg ramp rests on frictionless ice. Lauren slides her 2.5 kg binder across the ice at 7 m/s such that it slides up the ramp, causing the binder and ramp to slide across the ice together. Assuming that no energy is lost to friction sliding up the ramp, how high does the binder slide up the ramp?
6. An 8 kg bowling ball slides down the alley at 4 m/s and collides with a 1.5 kg bowling pin at rest. By what factor is the speed of the bowling ball reduced if the pin leaves at 6.5 m/s? Assume perfectly elastic collision.

Answers:

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|-----------------------|--------------------------------------|
| 1. 0.55 m/s | 4. 0.9 m/s |
| 2. 2 670 marshmallows | 5. 2.18 m |
| 3. 0.166 m/s | 6. 69.5 %, the new speed is 2.78 m/s |