Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Physics 11

**Worksheet 6.2**

**Impulse and Momentum**

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| 1. A rocket at rest with a mass of 9500 kg is acted on by a net force of 150,000 N upwards for 15 s. What is the final velocity of the rocket? 2. A 26.3 kg object is traveling at 21 m/s north. What net force is required to bring the object to a stop in 2.6 s? 3. A net force of 31.6 N south is used to accelerate a 15 kg object uniformly from rest to 10 m/s. What impulse does the net force give to the object? 4. A net force of 25 N acts north on an object for 720 ms. What is the change in the object’s momentum? | 1. A 5 kg object accelerates uniformly from rest to a velocity of 15 m/s east. What impulse did the object experience? 2. An 11 kg object accelerates from rest, traveling 26.3 m west in 3.2 s. What is the change in momentum of the object? 3. A 1.3 kg object is dropped from a height of 6.5 m. How far had the object fallen when its momentum was 6 kgm/s? 4. A net force of 16 N acts on an object for 200 ms, causing it to accelerate from rest to 3.5 m/s. What is the object’s mass? |

1. A 0.5 kg object is thrown vertically upward by a student who applies a force of 8.2 N to the object for 0.67 seconds.
   1. Draw a picture for this scenario.
   2. Draw a free body diagram for the object while it’s in the student’s hand being thrown.
   3. What is the net force acting on the object while it’s in the student’s hand being thrown.
   4. What is the velocity of the object when it leaves the student’s hand (use impulse and momentum)?
   5. Solve (d) again, but WITHOUT using impulse and momentum.

Answers: 1) 236.8 m/s upwards 2)212.4 N south 3) 150 Ns south 4) 18 kgm/s north

5) 75 Ns east 6) 180.8 kgm/s west 7) 1.09 m 8) 0.914 kg 9c) 3.3 N upwards

9d) 4.42 m/s upwards