# Unit 6: Momentum

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|---|---|---|---|
| 4-Jan | 5-Jan | 6-Jan<br>Due: Winter Break HW<br>Lect #1: Impulse<br>Lab: Balloon Toss<br>HW: Lab/Grade WB HW | 7-Jan<br>Due: Graded WB HW<br>Return Exams<br>PS1<br>HW: Graph WS | 8-Jan<br>Due: PS1, Balloon Lab<br>Lect #2: Cons of Mom.<br>Lab: Bungee<br>HW: Finish lab, Mom WS |
| 11-Jan<br>Due: Graph WS, Lab<br>Discuss Lab<br>More Cons of Mom Ex<br>HW: PS2 | 12-Jan<br>Due: Momentum WS<br>Warm up, discuss PS2<br>**10 pt Quiz**<br>HW: Conceptual Qs | 13-Jan<br>Due: PS2<br>Lect #3: 2D collisions<br>HW: 2D Collisions WS | 14-Jan<br>Due: Conc Qs<br>Discuss Conc Qs, Quiz<br>Accident Reconst.<br>HW: Finish Accident | 15-Jan<br>Due: 2D WS<br>Discuss Accident<br>Stations<br>HW: Stations |
| 18-Jan<br>NO SCHOOL<br>MLK DAY | 19-Jan<br>Due: Accident<br>Discuss Stations<br>**15 pt Quiz**<br>HW: PS3 | 20-Jan<br>Due: Stations<br>Lect #4: Ctr of Mass<br>HW: PS4 | 21-Jan<br>Due: PS3, Ctr of Mass<br>Return Quiz<br>Discuss PS3 & PS4<br>HW: Start Review | 22-Jan<br>Due: ---<br>Review<br>**Challenge Problem**<br>HW: Exam tomorrow |

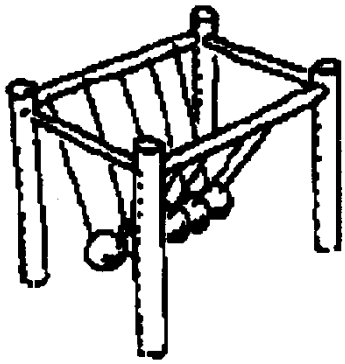
**Unit 6 Exam**: Monday, January 25th

Selected Answers

**PS1: pg. 282 (2, 4, 7-11)**
2. 0, 1.06 kgm/s
4. 31.0 m/s
7. proof, √2 mk
8. 438 N, 364 kgm/s
9. 13.5 Ns, 9000 N, 18,000 N
10. 5.4 kgm/s, -27 J
11. 260 N left

**Graph WS**
1. a) Ns, kgm/s  b) Nm, J
2. gains speed at a decreasing rate
3. 1.21 m/s
4. 0.61 J
5. 21 J
6. 2.65 m/s
7. 3.27 m/s
8. 15.2 kgm/s
9. impulse, work
10. 26 m/s

**Momentum WS**
1. 3 m/s →
2. 2 m/s →
3. 6 m/s ←
4. 2 m/s →
5. 6 m/s →
6. 9 m/s →
7. 6.67 m/s →
8. 4 m/s ←



**PS2: pg. 283 (15, 17, 20, 21a, 22)**
15. 65.2 m/s
17. 301 m/s
20. 15.6 m/s
21a. 20.9 m/s east
22. 2.5 m/s, 3.75 x $10^4$ J

**2D Collisions WS**
1. 9.3 m/s
2. 0.56 m/s
3. 2.5 m/s @ 60° below x-axis
4. 1.07 m/s @ 29.7° below x-axis
5. 0.89 kg @ 26.6° S of W
6. 12.5 m/s
7. 1.03 m/s

**Stations**
1. 40 N west, -90 J, 2.25 m
2. $(2gR)^{1/2}$, $(2gR)^{1/2}/2$, mgR/2, R/4L
3. 5.29 m/s @ 5.42°, inelastic
4. 0.5 m/s right, 3.125 kg, -0.73 m/s$^2$, 5.525 m, 0.118 m

**PS3: pg. 284 (26, 57, 59, 60, 61)**
26. 0.556 m
57. 1.39 km/s
59. 240 s
60. -0.667 m/s, 0.952 m
61. 0.980 m

**PS4: pg. 285 (40, 41, 49, 69)**
40. (0, 1.00 m)  41. (11.7 cm, 13.3 cm)
49. (7/5 **i** + 12/5 **j**) m/s, (7 **i** + 12 **j**) kg m/s,
69. 5.55 m, misses by 0.45  m