***Lesson Plans for the Week of: 1/30/17 Teacher: Hough Course: Physics Period: 3***

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| Elements of  a Lesson | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| Objective/  Focus/  Essential  Question | PH.2a; 4a;5a; 6b  --Explain what Conservation of Momentum means  --apply Conservation of momentum to problems | PH.2a;4a;5a;6b  --investigate Law of Conservation of Momentum  --research types of collisions, especially the differences between the types of collision | PH.2a;4a;5a;6b  --research types of collisions, especially the differences between the types of collision | PH.2a; 4a;5b  --Understand the two components of circular motion  --understand the factors which affect centripetal acceleration | PH.2a; 4a;5b  --relate centripetal force to centripetal acceleration  --apply the equations for centripetal acceleration and centripetal force |
| Lesson/Act.  Type of Presentation | Explain the law of conservation of momentum (LCM)  a) State the LCM  b) Write the equation for the LCM  Whole group:  Apply the LCM equation:  1) Confirm the units of the variables in the equation;  2) Go over situations in which the LCM holds: collisions, and when objects push away from each other  3) Note that in LCM problems, there is no friction; friction prevents the law from working, and so the problem involves low friction situations like water, ice, and outer space  Demonstrate principle using Phet Collision simulation  Model Sample problem: p. 201#1 | 2 groups will perform the LCM lab | Whole group:  Explain the differences between the types of collisions, the conditions; note what causes them, and the quantities which are conserved for each collision  Note p. 212 for summary of the collisions (for study purposes)  Can utilize Air Track Gizmo to ask formative assessment questions to confirm student understanding of the material; or just use the air track | Individual:  Students will look up the definition, equation and SI units for centripetal acceleration in the textbook p. 224-225 and write them in their notes  Whole group:  Notes: 1) clarify the definition and symbols for “tangential” and “centripetal” in this context; 2) clarify what r is in the equation; 3) factors which affect ac; and 4) spiral the concept of vector, explain how acceleration occurs when things are going in circles, even when the speed is concept  5) examples  Sample problem: p. 226#1 | Review tangential speed and centripetal acceleration; use Circular Motion Gizmo to illustrate  Review factors which affect circular motion  Model Sample problem: p. 226#1  Remind students of Newton’s 2nd Law and have students relate the acceleration on duckie to the force on the duckie; remind students that if it affects acceleration, then it will affect force  Explain units, symbols, direction, and equation for centripetal force  Reinforce that there is no centrifugal force, only inertia and centripetal motion  Model Sample problem: p. 228#2 |
| Evaluation |  | teacher observation, worksheet |  |  | Teacher observation |
| Extension/  Homework | p. 191#2,3; p. 215 #11a,b p. 201 #2,3; p. 216 #22a, 23 (emphasize showing correct math and correct directions, if applicable) |  |  | p. 226#2-4 | p. 226#2-4; p. 228 #1,3,4; p. 261#10b (m = 414 kg) |

Materials:

Monday: <https://phet.colorado.edu/sims/collision-lab/collision-lab_en.html>

Tuesday:

Wednesday:

Thursday:

Friday: