***Lesson Plans for the Week of: 3/20/17 Teacher: Hough Course: Physics Period: 3***

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| Elements of  a Lesson | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| Objective/  Focus/  Essential  Question | PH.8c  Understand sound in terms of a wave model | PH. 8b,c  Understand resonance  Investigate fundamental and harmonic frequencies | PH.8b,c  Understand light in terms of a wave model | PH.8b,c  Continue from previous day | No School |
| Lesson/Act.  Type of Presentation | 1) Review:  Sound is a longitudinal wave  Review amplitude, frequency, and wavelength in terms of longitudinal waves  2) Pitch is determined by the frequency of the sound wave (demonstrate)  3) Loudness (volume) is determined by the amplitude of the sound wave; given in decibels; logarithmic relation  4) perception of loudness depends on frequency; elementary school/band musical experience and figure in textbook  5) Doppler effect: train and ambulance as examples; model this with Doppler Gizmo | 1) Complete any concepts not finished in previous lessons  2) Resonance: define and demonstrate using resonance box,  Tacoma-Narrows Bridge  3) describe how fundamental frequencies work; utilize simulations to investigate this  4) practice math about fundamental and harmonic frequencies | 1) Review:  Light is a transverse wave  Review amplitude, frequency, and wavelength in terms of transverse waves; relationship between wavelength and frequency  2) Light is not a mechanical wave (It does not need a medium.).  3) intensity of light is related to the amplitude of the light waves  4) color of the light is related to the frequency of the light  5) fun: color mixing with lights vs color mixing with pigments  --lights mix (like in a concert)  --pigments mix by subtraction | Continue from previous day | Emphasize pitch, volume, ultra- and infra-sound,  Color, intensity? Light vs pigment |
| Evaluation |  | Classwork: fundamental and harmonic frequencies |  |  |  |
| Extension/  Homework |  |  |  |  |  |
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Materials:

Monday: Teacher-made notes; sound meter; multiple tuning forks

Tuesday: resonance box; Science World video of Tacoma-Narrows bridge collapse; <http://www.physicsclassroom.com/class/sound/Lesson-4/Fundamental-Frequency-and-Harmonics> and <https://phet.colorado.edu/en/simulation/legacy/fourier>

Wednesday: Teacher-made notes; colored LED lights; art pastels; computer Word program—the custom color window; or <https://phet.colorado.edu/en/simulation/color-vision>

Thursday:

Friday:

PH.8 The student will investigate and understand wave phenomena. Key concepts include

1. wave characteristics;
2. fundamental wave processes; and
3. light and sound in terms of wave models.