IB Physics - Add refraction lab

Topic 4 – Simple Harmonic Motion and Waves

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| A/B | Class | Due on this class |
| 1  Apr 9/13 | -Intro to Simple Harmonic Motion (SHM)  -Kinematics of SHM | **Read:** 11.1,3 |
| 2  Apr **14**/15 | -Dynamics and Energy in SHM  -Resonance (Intro/Film)  -Resonance Demos/Destroying the School | **Read:** 11.2,4-6  **Practice #1:** Simple Harmonic Motion: 1-4 |
| 3  Apr 16/17 | -More Resonance | **Practice #2:** Simple Harmonic Motion: 5-8 |
| 4  Apr 20/21 | -Intro to Waves: Frequency, wavelength and velocity | **Read:** 11.7  **Practice #3:** Simple Harmonic Motion: 9, 11: 3, 5, 7 |
| 5  Apr 22/23 | -Types of waves /Energy Transport  -Reflections | **Read:**  11.8,9,11  **Practice #4:** 11: 36(2.2 m/s), 37 |
| 6  Apr 24/27 | -Superposition and Interference patterns  -Young's double slit experiment (qualitative)  -Standing waves intro | **Read:** 11.12,13 23.2[[1]](#footnote-1)  **Practice #5:** 11: 38(190 m to 550 m, and 2.78 m to 3.41 m) |
| Apr 28rd | **ACTACTACTACTACTACTACTACTACACTAC** |  |
| 7  Apr 29/30 | -Standing waves frequency and wavelength  -Standing wave demos | **Practice #6:** 12: 46(343 Hz, 1029 Hz, 1715 Hz)  **Read:** 12.4 |
| May 4-8 | **Oaks Park week May 4th - 8th** |  |
| May 11/12 | Work on Oaks Park |  |
| May 13/14 | Work on Oaks Park |  |
| May 15/18 | **Oaks Park Presentations to class** |  |
| 8  May 19/20 | -The Doppler effect/Shock Waves | **Read:** 12.1,2,3,5,6  **Practice #7:** 11: 52(440 Hz, 880 Hz, 1320 Hz, 1760 Hz), 53, 54(70 Hz, 140 Hz, 210 Hz, 280 Hz) |
| 9  May 21/22 | -Sound Introduction –-Beat formation  -Sound, Standing waves and Music  -Description of Sound lab | **Read:** 11.15, 24.5  **Practice #8:** 12: 4(0.64 s, 2.9 s, use 1560 m/s as the speed of sound in sea water), 6(427 m, use 2949 m/s as the speed in concrete), 25, 40(15 Hz, 3.8 Hz), 41 |
| 10  May 26/27 | **Summative Assessments on:**  **11.1 - Simple Harmonic Motion**  **12.1 - Standing Waves**  **12.2 - Doppler Effect** | **Read:** 12.7,8  **Practice #9:** 11: 66(1.7x10-2 m), 12: 1, 30(0.656 m, 262 Hz, 1.31 m, and the same as in the pipe, 262 Hz, 1.31 m) |
| 11  May 28/29 | -Sound lab or SHM Lab - An eclectic group project | **Practice #10:** 12: 34(closed, 88 Hz), 33, 49, 50(1710 Hz, 1420 Hz), 51  **Practice:**Your lab plan |
| 12  Jun 1/2 | -Refraction in one dimension  -Solving refraction problems in two dimensions  -Total internal reflection and critical angle  -Refractive index and wavelength: dispersion -Diffraction and resolution | **Read:** 11.14, 23.4  **Practice #11:** 12: 53, 54(3.09x104 Hz), 55 |
| 13  Jun 3/4 | -The Rayleigh Criterion  -Bats  -Properties of Electromagnetic waves  -Polarisation | **Read:** 23.5,6, 24.4  **Practice #12:** 23: 23, 24(1.31), 25  **Turn In:** Sound Lab |
| Finals | **Cumulative Super Fun Final** |  |
| 4 Formative Assessments/3 Summative:   * 11.1 – Simple Harmonic Motion * 12.1 – Standing Waves * 12.2 – Doppler and interference * 12.3 – Refraction and interference (Formative Only)   A Cumulative Final (Don't freak out - I will tell you exactly what is on it)  Two Labs:   * Sound lab – Your own procedure – done in class. No handout. * Oaks Park – Student presentations of analysis of work done at Oaks Park | | | Handouts:   * This Syllabus * Simple Harmonic Motion (worksheet) * Oaks Park   + Permission/Parent Letter   + Prearrange   + Oaks Park Lab * FA11.1 – Simple Harmonic Motion * FA12.1 – Standing Waves * FA12.2 – Doppler and interference * FA12.3 – Refraction and interference | |

1. Yes – this is not a typo. Chapter 23 starts on page 683, and 24 on 723. We jump around a bit in this chapter. [↑](#footnote-ref-1)