IB Physics

Atomic and Nuclear

Chapter 27, 28, 30, 31 Syllabus

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| Block | Class  | Due on this class[[1]](#footnote-1) |
| 1**Feb 9** | -Hubris at the end of the century-Einstein's particle theory of light-Photo-electric effect | **Read:** 27-1, 2, 3Bring your data booklet. |
| 2**Feb 11** | -Momentum of Photons-de Broglie wavelengths and electron microscopes-Electron Diffraction | **Read:** 27-4, 7,8,9**Check #1:** 27:10(5.87E-26 J, 3.67E-7 eV), 11, 18(401 nm), 20(2.18 eV, 0.93 V), 21 |
| 3**Feb 13** | -Rutherford's atom and Closest approach -Bohr’s atom and atomic spectra | **Read:** 27-10,11,12,13**Check #2:** 27: 14(1.1E-27 kg m/s), 15, 22(0.93 eV, 5.7E5 m/s), 23, 24(Wo = 3.55 eV, a. 0.90 eV, b. no electrons) |
| 4**Feb 18** | **-PreQuiz 27.1 -** Photons-The Heisenberg uncertainty principle -The Schrodinger wave equation  | **Read:** 28-1,2,3,4,5**Check #3:** 27: 37, 41, 50(6 to 3), 52(488 nm, 103 nm, 435 nm), 63, 77 |
| 5**Feb 20** | -Atomic Notation and Binding Energy**-Skill Set 27.1** | **Read:** 30-1,2 **Check #4:** 28: 3(1.3E-11m), 4(2.9E3m/s), 5(3.3E-8 ev), 6(1.3E-25 s) |
| 6**Feb 24** | -Radioactivity/Types of radiation-Alpha decay energy/Tunneling (Heisenberg Energy) | **Read:** 30-3,4,5,6,10,12**Check #5:** 30: 11, 12(7.48 MeV/nucleon), 13, 14(32.0MeV, 5.33MeV/Nucleon, 1.64 Gev, 7.87 MeV/nucleon) |
| 7**Feb 26** | -Half life-Decay rates | **Read:** 30-8,9,11**Check #6:** 30: 28a(6.11 MeV), Nuclear: C: P1-3, Q1, E: P1-2, Q1[[2]](#footnote-2) |
| 8**Mar 2** | -Nuclear Reactions-Nuclear Fission and Fusion-Nuclear stability – The strong nuclear force | **Read:** 31-1,2,3**Check #7:** 30: 36(2.3 hr), 37, 38(1.2E9 decays/s), 39, 43, 44(4.3E16 nuclei, 2.9E15 nuclei, 6.5E13 decays/s, 26 min) |
| 9**Mar 4** | **-PreQuiz 30.1 –** Nuclear-Digital information storage/ Binary | **Read:** 14.1, 2, 6 (SL-HL Text)[[3]](#footnote-3)**Check #8:** 31: 5, 3, 11, 12(5.025 MeV, exo), Nuclear: M: 12 |
| 10**Mar 6** | -Image resolution and CCD devices-Graph of Photo assignment – make the graph**-Skill Set 30.1** | **Read:** 14.1.3, 4, 5 (SL-HL Text)**Check #9:** Digital: A: 1-3, B1-3[[4]](#footnote-4), 30: 49 |
| 11**Mar 10** | -Image resolution and CCD devices-Decay Lab-Lines and slopes on the Photo Electric Graph | **Video Flip: Photo Electric Graph (points and error bars)****Read:** 14.2.\* (All of 14.2 from the SL-HL Text)**Check #10:** Digital: E: P1-3,30:56(1.8E4 yr), 31: 18(6E18 reactions/s) |
| 12**Mar 16** | -Finish Photo Electric Graph-Work on Decay lab | **Check #11:** Digital: G: P1-2, 31: 17, 22(3.7E-4 kg)**Turn In: Graph of Photo-Electric** |
| 13**Mar 18** | **IB Mock Test on Atomic and Nuclear** | **Turn In: HW27- 31:** 11 stamps!**Turn In: Decay Lab** |
| **Mar 20** |  **Relativity!!!!!!!!!!!!!!** |  |
| Assignments* 2 Labs:
	+ Photo-Electric Effect Graph – Graph data with uncertainty and best fit lines to determine the work function and Planck’s constant
	+ Decay Lab – Determine the half-life of a computer simulated nuclear decay
* 2 PreQuizzes/Skillsets
	+ 27.1 – Photons
	+ 30.1 – Nuclear
* Homework from 11 days

A crazy actual IB test. (It will be as hard as H%$&.) I will tell you what is on it, and pls study!!!  | Handouts* PreQuiz27.1
* PreQuiz30.1
* This Syllabus
* Lab-NuclearDecay
* Lab-PhotoElectric
* Objectives A-F, G-O
* Nuclear Objectives A-S
* Digital Information A-L
* Many note guides
* Climate Change EC Unit
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1. Be careful – we skip around a lot from chapter to chapter in this unit. Some things are even from a different text. 27: means problems from Chapter 27. Your homework will be super important in this unit, you will need to work hard on it. [↑](#footnote-ref-1)
2. These problems are on the Nuclear Objectives A-S sheet. P means problems, Q means questions. [↑](#footnote-ref-2)
3. This text is at tuhsphysics.ttsd.k12.or.us just put “/IBDocs/IB-SL-HL-Textbook/” at the end. [↑](#footnote-ref-3)
4. These problems are on the Digital Information Storage Objectives A-L Sheet. Do the problems. [↑](#footnote-ref-4)