Atomic and Nuclear

Chapter 27, 28, 30, 31 Syllabus

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| **Block** | Class | Due on this class[[1]](#footnote-1) | |
| **1**  **Mar 11** | -Hubris at the end of the century  -Einstein's particle theory of light  -Photo-electric effect | **Read:** 27-1, 2, 3  Bring your data booklet. | |
| **2**  **Mar 15** | -de Broglie wavelengths and electron microscopes  -Electron optics/photon interactions  -Hand out Photoelectric Graph assignment | **Read:** 27-4, 7,8,9  **Check #1[[2]](#footnote-2):** 27:10(5.87E-26 J), 11, 18(401 nm), 20(2.18 eV, 0.93 V), 21 | |
| **3**  **Mar 17**  St Patrick’s Day! | -Rutherford's atom and Closest approach  -Nuclear radius  -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**  **Mar 29** | -The Heisenberg uncertainty principle  -The Einstein-Bohr debate  -Lines and slopes on the Photo Electric Graph?? | **Video Flip: Photo Electric Graph (points and error bars)**  **Read:** 28-1,2,3,4,5  **Check #3:** 27: 37, 41, 50(6 to 3), 52(488 nm, 103 nm, 435 nm), 77 | |
| **5**  **Mar 31** | -Particle Physics – Accelerators  -QED and field particles | **Read:** 32-1-3  **Check #4:** 28: 3(1.3E-11m), 4(2.9E3m/s), 5(3.3E-8 ev), 6(1.3E-25 s)  **Turn In: Graph of Photo-Electric** | |
| **6**  **Apr 4** | -Particle Physics – Decays and conservation laws  -“Six quarks for Muster Mark!” | **Read:** 32-4-9  **Check #5:** 32: 3 | |
| **7**  **Apr 6** | -Atomic Notation and Binding Energy | **Read:** 30-1,2  **Check #6:** 32: 3 | |
| **Apr 8** | IB Review 7:00 – 8:00 | Data Packet/General tips for test/Work on sample test | |
| **8**  **Apr 8** | -Radioactivity/Types of radiation  -Alpha decay energy/Tunneling (Heisenberg Energy) | **Read:** 30-3,4,5,6,10,12  **Check #7:** 30: 11, 12(7.48 MeV/nucleon), 13, 14(32.0MeV, 5.33MeV/Nucleon, 1.64 Gev, 7.87 MeV/nucleon) | |
| **9**  **Apr 12** | -Half life  -Decay rates | **Read:** 30-8,9,11  **Check #8:** 30: 28a(6.11 MeV), Nuclear: C: P1-3, Q1, E: P1-2, Q1[[3]](#footnote-3) | |
| **10**  **Apr 14** | -Nuclear Reactions  -Nuclear Fission and Fusion  -Build Your own Nuclear Weapon Lab | **Read:** 31-1,2,3  **Check #9:** 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) | |
| **11**  **Apr 20** | -Nuclear stability – The strong nuclear force  -Decay Lab/Young’s Double Slit Lab | **Check #10:** 31: 5, 3, 11, 12(5.025 MeV, exo), Nuclear: M: 12 | |
| **Apr 19** | **ACT Day/IB Review 9:00 – 2:00** | **Have your sample test finished by this day!!!!!!** | |
| **12**  **Apr 22** | -Work on Decay lab  -Work on Young’s Double Slit lab | **Check #11:** 31: 17, 22(3.7E-4 kg) | |
| **13**  **Apr 26** | -Work on Decay lab  -Work on Young’s Double Slit lab | **Turn In: HW27- 31:** 11 stamps! | |
| **14**  **Apr 28** | **Summative Assessments on:**  **27.1, 28.1, 30.1, 30.2** | **Turn In:** Decay Lab  **Turn In:** Young’s Double Slit Lab | |
| 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 * 4 Formative/Summative Assessments   + 27.1 – Photons   + 28.1 – Atomic and particle   + 30.1 – Radioactivity   + 31.1 – Nuclear Reactions * 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   * FA27.1 * FA28.1 * FA30.1 * FA31.1 * This Syllabus * Lab-NuclearDecay * Lab-PhotoElectric * Objectives A-F, G-O * Nuclear Objectives A-S * Many note guides |

1. Be careful – we skip around a lot from chapter to chapter in this unit. 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. Label these “Check #1”, “Check #2” etc, and demarcate the “checks” with horizontal lines across the page. [↑](#footnote-ref-2)
3. These problems are on the Nuclear Objectives A-S sheet. P means problems, Q means questions. [↑](#footnote-ref-3)