

Physics HW | Due Monday

LINK: <https://youtu.be/be83V-tlj38>

**NOTE: This is worth of 5 HW (HW 73, 74, 75, 76 and 77)
You Must Type the Answer!**

1. What is light?
2. What did Newton do?
3. *What is the difference between a marker and the sun?*
4. *But what exactly is emitted from sun? Is it a particle like an atom or wave like ripples on the surface of a pond?*
5. What did Max Planck do?
6. What did Niels Bohr do?
7. What did Einstein do?
8. Let's start our conversation with Hydrogen. How does that sound?
9. Tell me something about the emission spectrum of atomic Hydrogen.
10. What is the Rydberg formula for Hydrogen?
11. Why do the colors separate?
12. Is the energy of the electron quantized?
13. Draw the energy level of Hydrogen atom from n_1 to n_5
14. Calculate the energy of each level from n_1 to n_5
15. How much energy does an electron need to jump from ground state to $n = 3$?
16. Where do electrons get their energy from?
17. How does a photon knock lose an electron?
18. That's awesome! If a photon of wavelength is 525 nm long hits a metallic cesium ($W_f = 3.43 \times 10^{-19}$ j) find velocity of the photoelectron produced.
19. Find the energy of the light emitted if electron jumps from $N=3$ to $N=2$.
20. Now find the frequency.
21. Now find wavelength (λ)
22. What color is the light?
23. Now can find the speed of light?
24. light is a particle. Is it?
25. Two beams of light crossing each other's paths don't interact with each other at all! If light was made of particles, you would expect some of the particles from beam A to crash with some of the particles of beam B. If that happens, then the two particles involved in the collision would bounce off in random directions. But that does not happen.
26. Another problem is that light makes interference pattern. Can you show that only waves makes interference pattern and particles don't?