* **Atomic Emission Spectra and Quantum mechanical Model**

**Waves**

**Low Frequency and High Frequency waves**

* Frequency is cycles per second

**Electromagnetic Spectrum**

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**Atomic Emission Spectra**

* Pattern formed when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ grating to separate it into different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_it contains
* Atomic emission spectra is caused by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the electrons move\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* When the energy goes back down to their lower energy level, it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ground State/Excited State**

* Ground state: electrons at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ - Example: Sodium’s outer electron is in the s orbital
* Excited state: electrons going to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Example: Sodium outer electron going to the s orbital to p (p orbital is higher energy than s)

**How are frequencies of light emitted by an atom in relation to changes of electron energy?**

* The electrons are moving from a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(excited state to ground state)

**Classical vs. Quantum Mechanics**

* Classical mechanics \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* In quantum mechanics, matter moves \_\_\_\_\_\_\_\_\_\_\_\_\_and it pertains to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, such as light particles, atoms

**Heisenberg Uncertainty Principle**

* It is impossible to know both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_electron at the same time

**Famous scientist in quantum**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: energy changes in small units known as \_\_\_\_\_\_\_\_\_\_\_\_(Energy= Planck’s constant x frequency) E=hv
	+ - * + Planck’s constant is 6.626 x 10-34 Js
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: used Planck’s theory to explain the photoelectric effect
	+ - Photoelectric effect: light can be described as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: explains that all matter moves like waves