Name:	Date:	Period:

IB Physics SL Y2– Photoelectric Effect PhET Lab

Today, you will use the Photoelectric Effect PhET Lab to explore what happens when light interacts with matter. The photoelectric effect occurs when light strikes a surface and liberates electrons.

Beginning Observations – Open the Photoelectric Effect PhET Simulation.

Before adjusting anything answer the questions below

1) Before you begin, what do will happen to ...

a) the metal surface when light strikes it

b) the light the intensity slider is moved

2) Do you think all intensities of light will liberate electrons? Explain.

3) Do you think all wavelengths of light will liberate electrons? Explain.

Part 1 – Intro to Photoelectric Effect

1) What can you change in the simulation?

2) Select a metal to study. Develop a procedure for determining the characteristics of the light necessary to liberate electrons from the metal. Write your procedure and your conclusions below.

3) Based on your chosen metal answer the following questions

a) At what wavelengths was it first possible to remove electrons?

b) What wavelengths were most effective?

c) What does intensity change?

Part II – Finding a Model for the Photoelectric Effect

Graph	Relationship	Explanation (using physics terms)
Current vs. Battery Voltage		
Current vs. Light Intensity		
Electron Energy vs. Light Frequency		

4) Describe the three graphs you can view in the simulations by filling in the table below.

5) Propose a mathematical equation for the photoelectric effect using the terms we have discussed in class (work function, incident light, max E of ejected electrons). Use the simulation to verify your model and make a graph of the maximum electron energy vs. the light frequency.

Selected metal: ______

light wavelength (nm)	light frequency (Hz)	electron stopping voltage (V)	Ejected Electron KE (eV)

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Best fit equation for your graph -

Conclusion –

In 2-3 paragraphs explain your understanding of the photoelectric effect include a discussion on

- Intensity and wavelength of the incident light
- Wave model and its breakdown