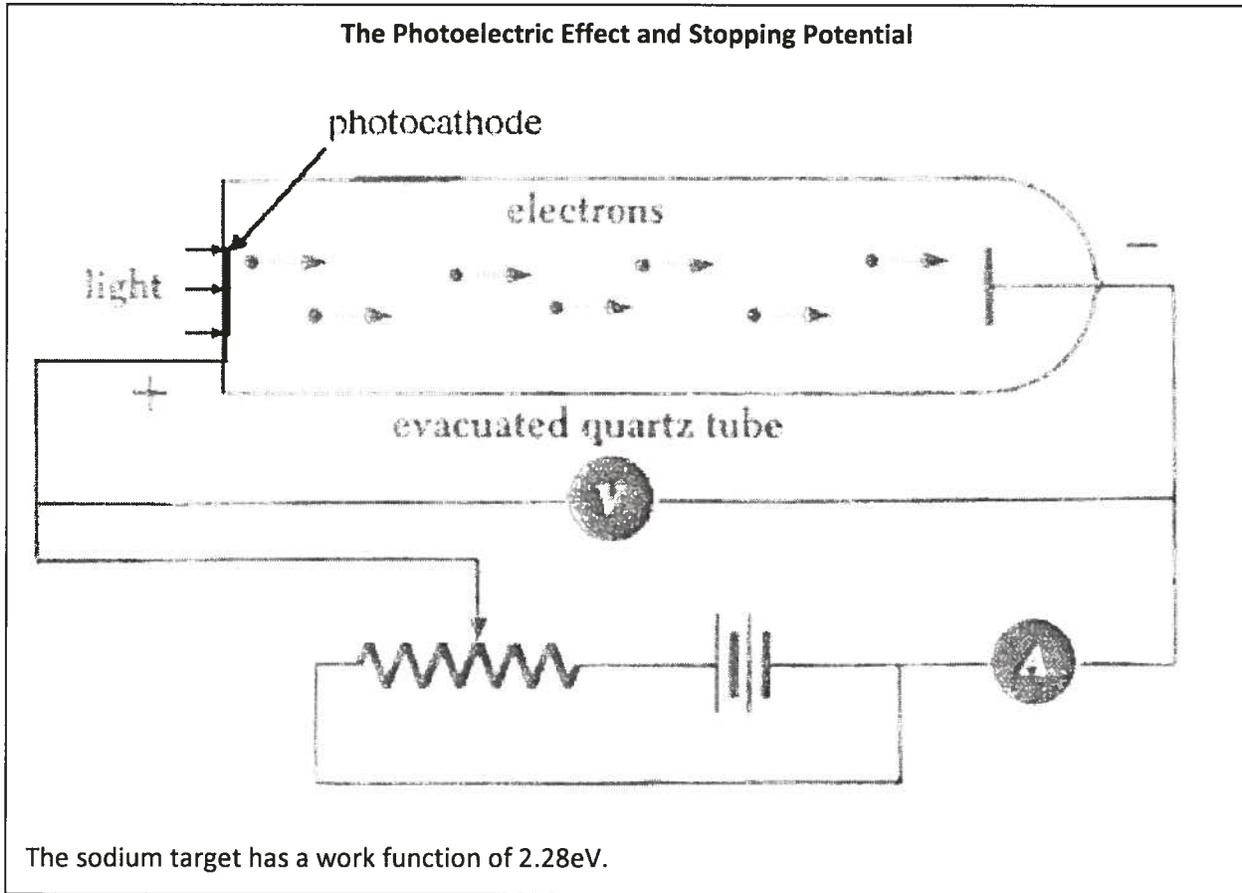


First Name: _____

Last Name: _____

L15 - Formative Quiz - Photoelectric Effect 2

Use the following diagram to answer Q1:



Q1: If incident light of wavelength 415nm causes the emission of photoelectrons, determine the required stopping voltage to prevent the completion of the circuit, in Volts. (1 mark)

(Record you three-digit answer in the numerical response boxes below.)

0	.	7	1
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$$\Delta V = \frac{\Delta E_p}{e}$$

$$\Delta V = \frac{0.71277 \text{ eV}}{1e}$$

$$\Delta V = 0.71277 \text{ V}$$

$$E_{\text{photon}} = W + E_k$$

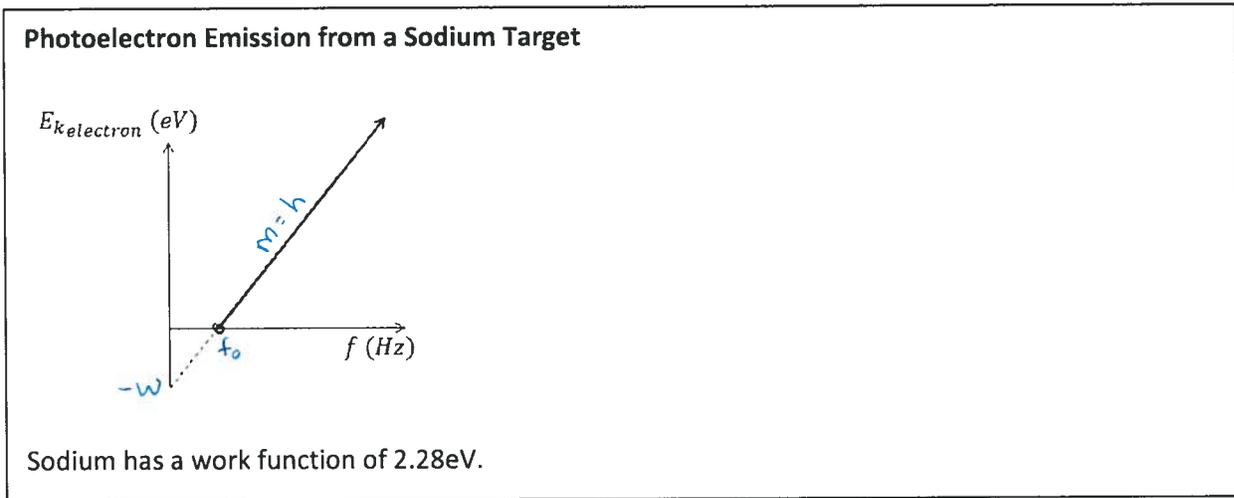
$$\frac{hc}{\lambda} = W + E_k$$

$$\frac{(4.14 \times 10^{-15} \text{ eVs})(3.0 \times 10^8 \text{ m/s})}{(415 \times 10^{-9} \text{ m})} = 2.28 \text{ eV} + E_k$$

$$E_k = 0.71277 \dots \text{ eV}$$

where $E_k \rightarrow E_p$

Use the following information to answer Q2 to Q4:



Q2: Determine the absolute value of the y-intercept, in eV. (1 mark)

(Record you three-digit answer in the numerical response boxes below.)

2	.	2	8
---	---	---	---

Q3: The x-intercept has a value of $a.b \times 10^{cd}$ Hz, where the values of $a, b, c,$ and d are ____, ____, ____, and _____. (1 mark)

(Record you three-digit answer in the numerical response boxes below.)

5	5	1	4
---	---	---	---

$$w = hf_0$$

$$2.28 = (4.14 \times 10^{-15}) f_0$$

$$f_0 = 5.507 \times 10^{14} \text{ Hz}$$

Q4: The slope of this graph has a value of $a.b \times 10^{cd}$ eVs, where the values of $a, b, c,$ and d are ____, ____, ____, and _____. (1 mark)

(Record you three-digit answer in the numerical response boxes below.)

4	1	1	5
---	---	---	---

$$m = \text{plank's constant}$$

$$= 4.14 \times 10^{-15} \text{ eVs}$$

$$\approx 4.1 \times 10^{-15} \text{ eVs}$$

MARKING:

Beginning	0-1
Progressing	2
Competent	3
Exemplary	4