Wave Formulas 1 v1 Name _____

Level: 3
Version 1
Name:

Objective:
Quantitatively relate wavelength, frequency, and photon energy of a wave; problems presented step by step.

You must show some work on each problem.
You will not receive credit if you simply write answers.

Reference Information:

$$E = h\nu$$
$$\nu\lambda = c$$

1 Joule = 6.24 x 10^{18} electron volts.

Planck's Constant = 6.626 x 10^{-34} J s

Speed of Light = 3.00 x 10^{8} m/s
Metric Units

Text	**Symbol**	**Multiplier**
Tera	T	10^{12}
Giga	G	10^{9}
Mega	M	10^{6}
Kilo	K	10^{3}
Centi	c	10^{-2}
Milli	m	10^{-3}
Micro	μ	10^{-6}
Nano	n	10^{-9}

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Problem 1:
A photon has a wavelength of 650 nanometers. It is an orange-red color.

Determine:
a) The wavelength of the photon in meters:

b) The frequency of the photon in Hertz:

c) The energy of the photon in Joules

d) The energy of the photon in electron Volts

Problem 2:
A photon has an energy of 80 electron-volts.

Determine:
a) The energy of the photon in Joules:

b) The frequency of the photon in hertz.

c) The wavelength of the photon in meters.

d) The wavelength of the photon in nanometers.

What TV theme song has these lines?
“In West Philadelphia, born and raised
On the playground is where I spent most of my days”