

# Checkpoint 1 b



Which of the following actions will increase the energy carried by an electromagnetic wave?

**A.** Increase  $E$  keeping  $\omega$  constant

**C.** Both of the above will increase the energy

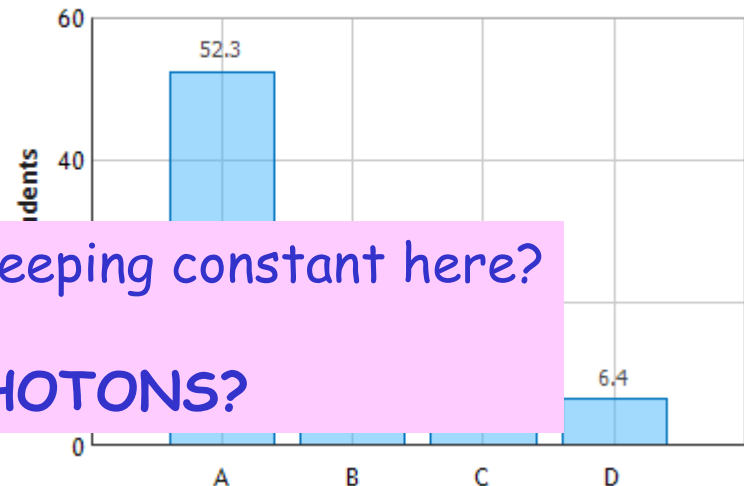
**B.** Increase  $\omega$  keeping  $E$  constant

**D.** Neither of the above will increase the energy

Intensity

$$I = \frac{1}{2} c \epsilon_0 E_o^2$$

Electromagnetic Waves: Question 3 (N = 826)



But then again, what are we keeping constant here?

**WHAT ABOUT PHOTONS?**

The energy of one photon is

$$\mathcal{E}_{\text{photon}} = hf = h\omega/2\pi$$

$$U_{\text{wave}} = N_{\text{photons}} \times \mathcal{E}_{\text{photon}}$$

$$\mathcal{E}_{\text{photon}} / \text{Volume} = 1/2 \epsilon_0 E_o^2$$