

Apr 13

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**FINAL EXAM INFO:**

**Wednesday, April 22<sup>nd</sup> from 12:00-1:50 in this room**

**Practice exam on website**

**QUIZ**

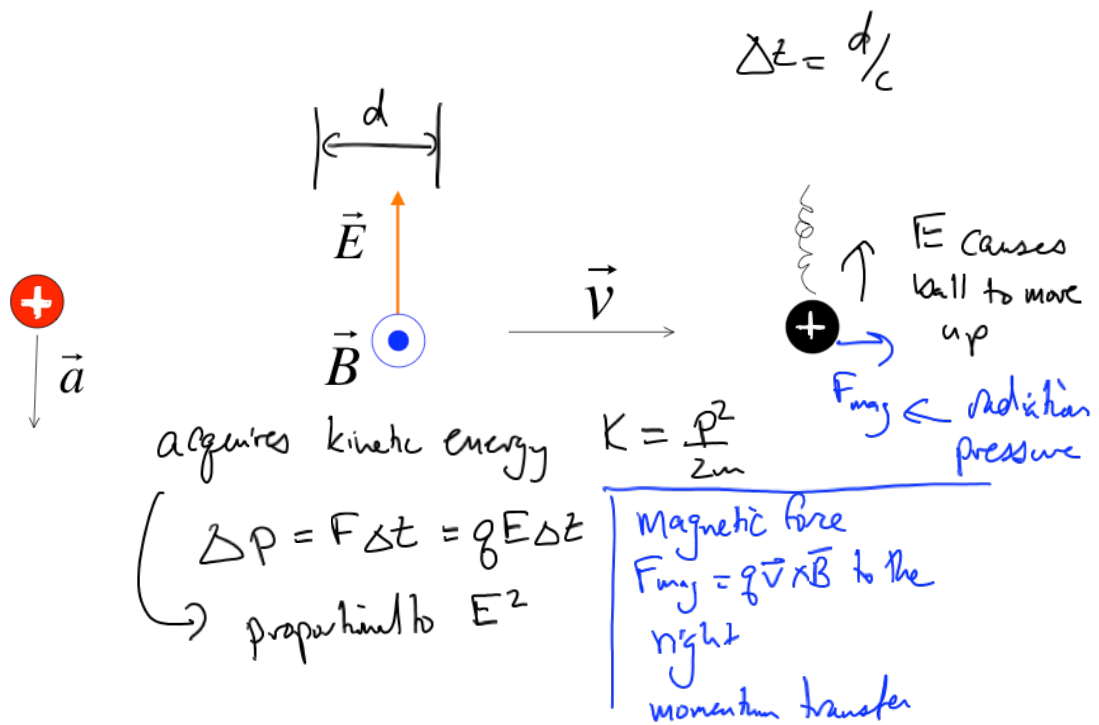
$$\lambda = \frac{h}{p} = \frac{h}{mv} \Rightarrow v = \frac{h}{m\lambda}$$

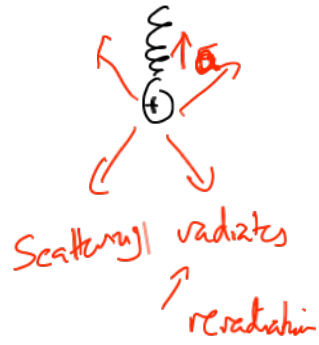
For scattering off crystal, want  $\lambda \sim 10^{-10} \text{ m}$

$$h = 6.6 \times 10^{-34} \text{ J}\cdot\text{s}, m = 9.1 \times 10^{-31} \text{ kg}$$

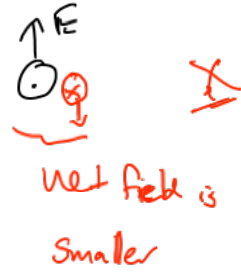
$$v = \frac{6.6 \times 10^{-34} \text{ J}\cdot\text{s}}{9.1 \times 10^{-31} \times 10^{-10} \text{ m}} = 7.25 \times 10^5 \text{ m/s}$$

# Discussion: Effects of E & M Radiation on Matter

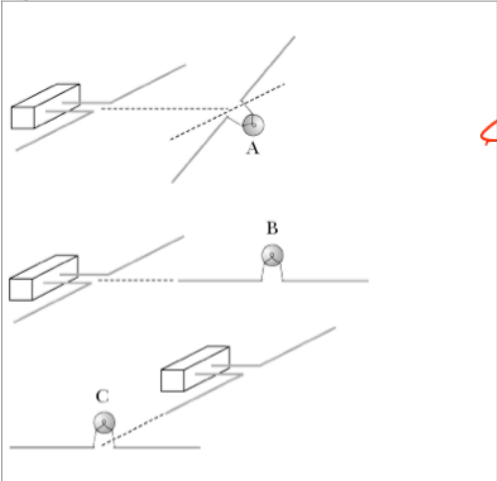




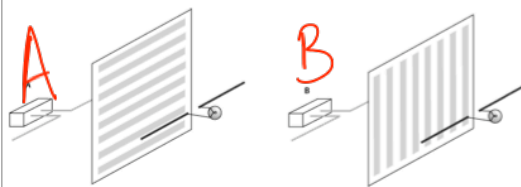
$$F_{\text{rad}} = -\frac{q^2 \vec{a}}{4\pi\epsilon_0 c^2}$$



**Demo: Wireless light bulb**  
**Q23.6a**

	<p><b>In which of these situations will the bulb light?</b></p> <ul style="list-style-type: none"><li><b>A) A</b></li><li><b>B) B</b></li><li><b>C) C</b></li><li><b>D) more then one of them</b></li><li><b>E) none of them</b></li></ul>
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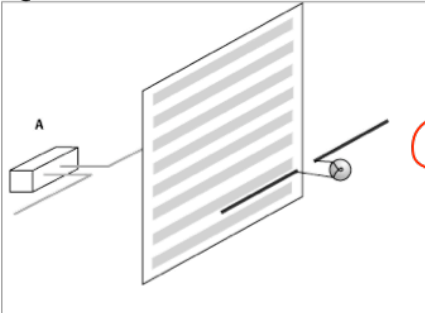
**Q23.6b**



**In which situation  
will the bulb light?**

- A) A
- B) B
- C) Both
- D) Neither

**Q23.6c**

	<p><b>Why doesn't the bulb light?</b></p> <p><b>A) Radiation can't get through the foil strips</b></p> <p><b>B) Reradiation by electrons in the foil strips decreases the energy that reaches the bulb</b></p> <p><b>C) The reradiated electric field is in the wrong plane</b></p>
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## **Discussion: Polarizers**