

Test for **Light and Matter Interactions** Activity

Name _____ Teacher _____

Date _____ Class _____

1. A blue laser is shown to pass through gaseous atoms without being absorbed. Which of the following could be done to test if photon absorption might occur at a lower energy?

 - a. use an orange laser
 - b. use a less intense blue laser
 - c. use a violet laser
 - d. use an ultraviolet laser
 - e. both a and b
2. In chemistry class one day, you learn that excited mercury atoms emit ultraviolet light. Upon hearing this, you set out to build a new type of light bulb which takes advantage of this phenomenon. You eventually develop a system that allows you to produce excited mercury atoms within a glass tube. The only problem is the light produced is still ultraviolet. Speculate on how you might alter your new bulb in order to convert the ultraviolet light to visible light. Explain your choice.
3. You read on a NASA website that the Sun is composed of the following elements: hydrogen, helium, oxygen, carbon, nitrogen, silicon, magnesium, neon, iron, and sulfur. Suggest how it is possible for astronomers to know that these specific elements exist in the Sun.

4. Yellow light from a sodium lamp makes blue objects appear black. This is because the atoms in the blue object: _____

- a. reflect all the light from the lamp.
- b. cannot absorb the yellow light.
- c. absorb all the yellow light.
- d. convert the light into heat.
- e. reflect blue light.

Explain your choice.

5. Glass is transparent because: _____

- a. Visible light is not absorbed by glass.
- b. Light bounces off all the atoms in glass.
- c. Light waves are much longer than the molecules in glass.
- d. Light waves are much smaller than the atoms in glass.
- e. Glass molecules line up to create channels that pass light.

Explain your choice.

6. Light consists of particles called photons that (circle T or F in each case):

have mass T or F

have charge T or F

carry energy T or F

travel at various speeds T or F

travel in straight lines T or F