

Glow-in-the-Dark (more background information)

The molecules that make up glow-in-the-dark material are called phosphors and are an example of everyday quantum physics!

Light has both wave and particle properties and the fundamental units of light are called photons (packets of waves). The energy of a photon is directly related to the frequency of light. Phosphors need to absorb photons with a minimum energy (frequency) in order to glow. When a photon is absorbed, the electrons in the phosphor become excited. They can't stay that way forever, so when they eventually release energy it comes out as light. This is the light you see when the material glows.

Try this:

Shine the white light on part of the glow-in-the-dark material and notice how much it glows. Then try it with the red light. You should notice that the red light doesn't make the material glow as well. This is because red light has a low frequency and therefore a low photon energy. This energy is below the minimum energy the phosphors need to glow. White light is made up of all different colors of light, including the high frequency light needed to make it glow. In visible light, the lowest frequency is red light and the highest is blue.

Glow in the Dark

Energy is never created or destroyed

To do and notice:

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What's going on?

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LIGO Connection: Einstein developed the modern photon concept gradually in the first years of the 20th century.