How Astronomers Use Light

How do astronomers learn about objects in the Universe? The most important resource to an astronomer is light: it can tell us how fast an object is moving, what it is made of, how it is interacting with other objects, and how it affects properties of the Universe. In this lab, we will investigate how astronomers use light to determine what an object is made of.

Around the classroom are three tubes, each filled with a different gas: hydrogen, helium, or neon. Using your diffraction gratings, you will view the spectra of these gases, and draw them in the boxes below using colored pencils. Hold the grating vertically close to one eye with the other eye closed, and draw what you see. Pay attention to the COLOR and the SPACING of the lines! Then you will compare your drawings to pictures of spectra of different gases. At the end of the lab, you will be able to tell which gas is in which tube.

Tube 1:

Tube 2:

Tube 3:
Match Your Drawings To The Pictures

Which tube has hydrogen in it? ________________

Which tube has helium in it? ________________

Which tube has neon in it? ________________

What are the similarities between the three spectra? What are the differences?
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Explain how you think astronomers use spectroscopy, like what you did above, to learn about objects in the Universe.
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