



**Main Ideas, Key Points,  
Questions:**

*After watching the video segment, write down key points, main ideas, and big questions.*

**Objective(s):**

- *Compare and contrast how absorption and emission spectra are created, and understand what the lines on each spectrum represent.*



**Notes:**

*During the video segment, use words, phrases, or drawings to take notes.*



**Summary:**

*After watching the video segment, write at least three sentences explaining what you learned. You may ask yourself: "If I was going to explain this to someone else, what would I say?"*

**Answer the following.**

1. Define spectral composition in your own words.

*Spectral composition refers to the wavelengths of light that characterize an object.*

2. How is the complexity of an element's spectral composition related to its number of electrons?

*The complexity of an element's (or a compound's)*

*spectral composition increases with its number of electrons.*

3. How does an absorption spectrum compare to an emission spectrum?

*An absorption spectrum indicates where light is absorbed by the electrons*

*in an element or compound by showing black lines on a color spectrum.*

*An emission spectrum indicates where light is emitted by the electrons*

*coming to their ground state by showing lines of color on a black background.*

*The wavelengths represented in each spectrum are the same for a given element or compound.*

4. What tool is used by scientists to view absorption and emission spectra?

*Scientists use a spectroscope to view absorption and emission spectra.*

5. How do scientists determine the composition of stars that are light years away?

*Scientists use the emission and absorption spectra of stars to determine*

*their composition, regardless of how distant the stars are from the telescope.*

6. How is a star or galaxy moving relative to a telescope if the absorption spectrum is shifted toward the red end of the visible spectrum?

*If the absorption spectrum is shifted toward the red end of the visible light spectrum*

*due to the Doppler effect, the star or galaxy is moving away from the telescope.*

**Answer the following.**

7. What is the opposite of a red shift? How is a star moving relative to a telescope when this occurs?

*The opposite of a red shift is called a blue shift.*

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*A star is moving toward a telescope when a blue shift occurs.*

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8. Define a quantum of energy in your own words.

*A quantum of energy is a discrete, exact packet of energy that is*

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*absorbed or emitted by electrons as they move between energy levels.*

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9. Are energy changes greater between lower energy levels or between higher energy levels?

*Energy changes between lower energy levels are*

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*greater than energy changes between higher energy levels.*

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