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Methods of STEM

Data Integration Assignment

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Data source:

Lesson Enhancement: This data enhances atomic emission spectra in that it provides a more tangible and relatable concept for students. Students understand oxygen and hydrogen and many elements exist, however there are many like hydrogen that they cannot see with their naked eye. Connecting this information with something that can see pictures of or look at in sky (stars) brings more familiarity to the concept. Additionally, students can see how their learning is tied to practical uses in science today like them recognition and identification of stars and their composition. This topic also lends itself to an artistic element in that students can express themselves via visual arts and make connections between things they experience on a daily basis (colors) and the science behind it. These kinds of connections provide relief, "wow" moments, and deepen curiosity in the things they are learning.

The inclusion of data is important as transferable skills are produced and refined in its use. It also provides legitimacy to what is being learned. Students have more confidence in what is being learned when data is supplied as opposed as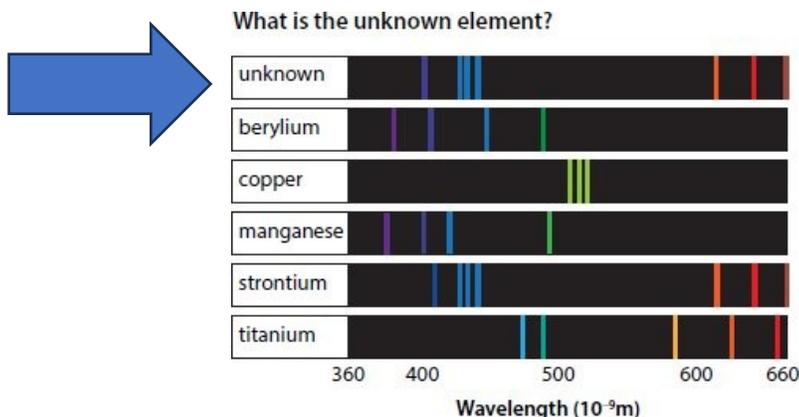 theoretical pieces of information and stories. Students may not be able to see what the data is concerning, but they can "touch" and "see" the data which makes the problems more real for them and more palpable to digest as a result.

Interdisciplinary Context: This data incorporates skills and concepts used in mathematics with use of scientific notation as well as well transferable skills to be used across the sciences like the analyzation of data. This lesson also connects to art as students can make connections between warm and cool colors, as well as color absorption which can be applied in artistic creations.

Atomic Emission Spectra Activity

Line Spectra practice.

1. Each element produces its own unique emission line spectrum that correlates to the transition that the electrons undergo. We can use these emission line spectra to detect elements that are in a mixture. **Using the line spectra of five known elements, *determine which element(s) is/are in the unknown*. <u>Justify</u> your selection(s).**

   What is the unknown element?

   unknown

   berylium

   copper

   manganese

   strontium

   titanium

   360   400   500   600   660

   Wavelength (10⁻⁹m)

   _____
   _____
   _____

2. Get with your group and choose a star from the on the next page.

   a. Determine the element(s) present based on the atomic emission spectra.

   b. Using a piece of chart paper and the coloring materials provided, create an artistic rendition of what you the star looks like based on your knowledge of the elements present and their emission spectra. When finished, hang the chart paper on the well. Your group will explain why you chose the colors you did based on your knowledge of the atomic emission spectra.

   Star: _____

   Element(s) present: _____

Atomic emission spectra:

(Source: https://www.youtube.com/watch?v=N3Oc1kNRamk&t=731s)