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SCED 548

Authentic Data Integration Assignment

Data Source:
Periodic Table
https://sciencenotes.org/periodic-table-for-kids-118-elements/

Lesson Enhancement:
Part of the standards' essential understanding is that elements can be classified as metals, nonmetals, and metalloids. My plan is to begin by giving students this basic black-and-white periodic table. Students will examine it to find any known elements and any other known information. We will work as a group to color code it by metals, nonmetals, and metalloids to come to a conclusion about how this dataset is organized. This will help lead into other ways to organize the elements (i.e. similar properties such as color, solubility, hardiness, density, conductivity, melting point and boiling point, viscosity, and malleability) which is another essential understanding. We can use this chart for reference throughout the entire unit but also refer back to it as we work through different labs that provide us with new information about certain elements. This will be a reference that we are "creating" as we work together to learn about the many properties of elements and how they can be classified.

Typically, students are just viewing a Periodic Table and reading it. This lesson would allow students to use their background knowledge of the elements to begin making observations and connections about the organization of the elements. They will be trying to make their own connections about how the table is organized versus viewing one that is already color-coded. I think this will help make the learning more student-led as students work together to combine their knowledge of the elements to try to organize and color code the Periodic Table.

Students will be able to begin the process of classifying elements as metals, non-metals, and metalloids; as well as organizing them by similar properties. We will be able to use this data-set throughout our course of study while we are working on analyzing the properties of different substances.

Using Data:
I believe that using data is an extremely useful real-world skill that we can teach our students. If we want our students to think like scientists, then we need to start working and teaching like scientists. We know that decisions are based on data in any science-related field so we should definitely be including that in our instruction. I think there is a stigma out there about data - that it is just a lot of numbers. I know I have had this thought! Data comes in all forms and just using that data to make informed decisions is beginning the process of scientific thinking.

I think it is also our civic duty to incorporate data into our classrooms, no matter the subject. This past year has definitely shown us the need for people to be able to think critically and scientifically about the information and data provided to us. We have such a huge impact on so many students that I do feel it is in our job description to prepare our students for the real

world and providing them with the skill of thinking like a scientist using data is one of the utmost important pieces of that!

<u>Rationale/Interdisciplinary STEM:</u>

        I decided to use this data source because it is a basic data source that will help students learn about why and how the Periodic Table is organized. This will be a lesson that I do early in the school year so it will not be an overwhelming source of data. It will also be a familiar data source since most students have seen a picture of it. This also will allow me to teach students that data is not always just numbers - it is a collection of information.

        This data source could lend itself to working with the engineering field as students could design testing processes to help organize the elements. Students are required to learn about the properties of elements so they can work on designing testing procedures for melting points and boiling points, viscosity, malleability, etc. As students get further into science, this could tie-in with mathematics when it comes to its atomic weight and other data that is included on the Periodic Table.