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The Periodic Table

Scenario

Every time you say you like or don't like something, you are putting it into a category. You have probably developed categories for many things in your life. You may have categories for food you eat for breakfast, as opposed to dinner, or for clothes you wear to school, as opposed to at home. Can you imagine what your life would be like if nothing were sorted into categories? What if you went shopping in a supermarket that displayed milk next to shoe polish, next to oranges, next to oatmeal, next to hams, next to orange juice, next to detergent? Where would you look for yogurt, shoelaces, corn flakes, ground beef, lemonade, and soap?

That kind of supermarket display pretty much describes the state of chemistry in the mid-19th century. By then chemists had identified and isolated a large number of chemical elements, but they needed a way to sort them into categories—much as a supermarket groups milk with yogurt, shoe polish with shoe laces, oatmeal with corn flakes, ham with ground beef, orange juice with lemonade, and detergent with soap.

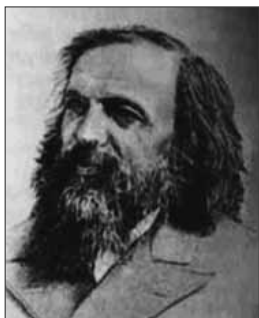


Like similar items in a supermarket, some chemical elements were recognized to share similar chemical properties. The first chemist to arrange these elements successfully into a pattern according to their properties was the Russian, Dimitri Mendeleev.

One of the things Mendeleev did was to write down everything that was known about each element on a small card. Then he moved the cards around until he got an arrangement that showed the groups of elements with similar properties.

Scenario

Read, or have a student read aloud, the **Scenario**. You may wish to expand on the **Scenario** by using videos, actual games, or by inviting persons from the field to present the **Scenario**.



Dimitri Mendeleev according to their chemical behavior. Surprisingly, it then revealed information about the structure of the atoms of those elements as well.

By writing the properties of the elements onto separate cards and arranging them, Mendeleev created a puzzle, and he solved that puzzle when he arranged the first version of what is now known as the Periodic Table of the Elements. The table was independently created at the same time by the German, Julius Lothar Meyer.

Chapter Challenge

Your challenge in this chapter is to develop a game related to Mendeleev's Periodic Table of the Elements.

In Mendeleev's time the periodic table was developed as a way to arrange elements

How the game is played, whether on a table, with cards, on a computer, or with equipment that only you might choose, is up to you. You might even choose to emphasize some aspects of the periodic table over others, or to focus on some types of information presented by the table rather than others.

However, you need to keep in mind the criteria you and your teacher establish.

Criteria

How will your game be graded? What qualities should a good game have? Discuss these issues in small groups and with your class. You may decide that some or all of the following qualities should be graded:

- how well the game shows your understanding of the periodic table;
- how well the game enables players to learn about the periodic table;
- how interesting the game is to play;
- how long the game takes to play;
- whether the game is sequential or can be continued.

Once you have determined the list of qualities for evaluating the game, you and your class should also decide how many points should be given for each criterion. Make sure that you understand all the criteria as well as you can before you begin. Your teacher may provide you with a sample rubric to help you get started.



Chapter Challenge

You may wish to lead a class discussion about the challenge and the expectations. Review the titles of the activities in the **Table of Contents**. To remind students that the content of the activities corresponds to the content expected for the **Chapter Challenge**, ask them to explain how the title of each activity relates to the expectations. Familiarize the students with the structure of each activity. When you come to the section **Reflecting on the Activity and the Challenge**, point out that each activity contributes to the challenge in some way. As you discuss the challenge, reassure students that while they may now feel incompetent to complete the assignment, by the end of the chapter they will have the necessary skills and vocabulary to respond adequately.

Assessment Criteria

A sample rubric for assessing the **Chapter Challenge** is provided on the following page. You can copy and distribute the rubric as is, or use it as a baseline for developing scoring guidelines and expectations that suit your needs. For example, you might wish to ensure that core concepts and abilities derived from your local or state science frameworks also appear on the rubric. You might also wish to modify the format of the rubric to make it more consistent with your evaluation system. However you decide to evaluate the **Chapter Challenge**, keep in mind that all expectations should be communicated to students at the start of their work. Be sure that the students actively participate in deciding the criteria for evaluation.