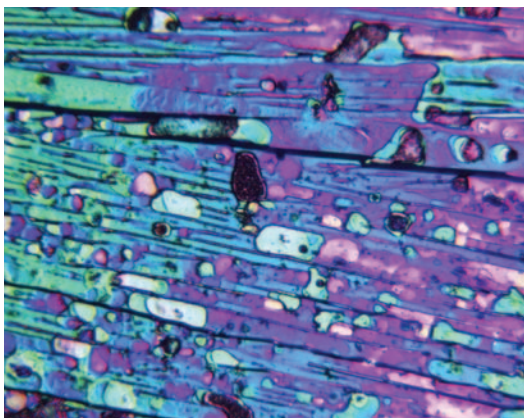


# Fun with the Periodic Table Assessment



Your *Chapter Challenge* is to create a game that will both entertain and teach people about the periodic table. 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 want to emphasize some aspects of the periodic table over others, such as why the elements are grouped the way they are, how atomic masses are determined, or how the electrons of the elements are configured. Or you may choose to focus on some types of information related to the table like the history of the discovery of atomic structure, how the elements combine to form compounds, and why some are radioactive.

## Chemistry Content

To begin, you should review all of the activities that you have completed. You can skim through the text and your *Active Chemistry* log to help remind you of the chemistry concepts in each activity.

**Activity 1:** You learned about organization. The periodic table is a way in which our knowledge about the properties of matter can be organized.

**Activity 2:** You investigated the properties of some elements. These properties included the ability to conduct electricity, whether the element reacted with HCl and whether the material was a metal or nonmetal. You also attempted to organize the elements in terms of these properties.

**Activity 3:** You learned how to compare and contrast elements and compounds. You were also able to determine the relative masses of elements. The mass of elements is another property by which elements can be organized.

**Activity 4:** The game of battleship was used as a tool to help you learn about the structure of the atom. You learned that the nucleus takes up a very, very small part of the atom. That tiny space holds all of the positive charge and almost all of the mass of the atom. You also learned about the discovery of the electron and its place in the atom.

**Activity 5:** You observed the specific colors of the light given off by hydrogen gas. By investigating these colors (and energies) of light, you learned how Bohr developed a model of the atom. You learned that electrons jumping from a higher energy orbit to a lower energy orbit emitted light of a specific energy and color.

**Activity 6:** You analyzed the ionization energies of elements and were introduced to the periodic table. You found out that the rows or periods of the periodic table were closely related to the ionization energies. You also recognized that the columns or chemical groups were comprised of elements with similar properties.

**Activity 7:** You investigated how electrons determine the chemical behavior of atoms. You paid particular attention to the valence electrons of each element.



**Activity 8:** You learned how atoms interact with each other. You also were introduced to the octet rule. You then learned how to differentiate between ionic and covalent bonds between atoms.

**Activity 9:** You investigated the electrostatic force that holds the electrons to the nucleus and holds atoms together. You also learned that the nucleus is made up of protons and neutrons. The nucleus is able to withstand the large electrostatic force of repulsion because an even larger nuclear force exists between nucleons (protons and neutrons). You were introduced to isotopes and their relation to the atomic mass of an element.

You may want to make a chart that shows the activity number, some chemistry concepts in the activity, and some ideas as to how you can use these concepts as part of your periodic-table game. Your chart may include whether the concept will be part of the rules or part of the equipment or part of the play. You should pay particular attention to the *Reflecting on the Activity and the Challenge*, *Chem Essential Questions*, and *Preparing for the Chapter Challenge* sections. You should also compare your list with that given in the *Chem You Learned* summary.

Activity #	Chemistry concepts	How to use concepts

You may decide to do the first activity as a group to ensure that everybody understands how to proceed. After completing the first activity, each team member can be assigned two or three activities. You can then review all of the activities as a group with the activity expert reviewing each summary.

## Criteria

You and your team should review the criteria by which you will be graded. Before beginning the chapter, your teacher led a class discussion to get a sense of what criteria should be used to judge the quality of work for this periodic-table game. It is time to revisit that discussion since you now have considerable understanding of the chemistry concepts that you can include in your presentation. Think about and discuss what would make a great game. How will you both entertain and help players learn concepts at the same time?

How will your game be graded? What qualities should a good game have? Your rubric should assign points to how well the game shows your understanding of the periodic table and how well the game enables players to learn about the periodic table. You may also wish to assign points to how interesting the game is to play and how long the game takes to play. This rubric can be a useful tool for your team to check the quality of your work and to ensure that you have included all necessary parts of the project.

## Preparing for the Chapter Challenge

### • Chemistry Concepts

Your team's next step would then be to decide on what kind of game you want to play and how you will incorporate the chemistry into the game. Will it be a board game or a physical game or a video game? Will individuals compete against one another or will teams be involved? How will the game end? How does someone win the game? How can your game include chemistry concepts?

### • Practice Playing Your Game

You need to practice playing your game to insure that the rules of the game make sense. You want to get a sense of how difficult the game is to learn and how long it takes to complete it. It may be helpful to call in some classmates who have not helped to develop the game to find out if the rules make sense. This "focus group" may be able to point out some facets of the game that need more work.

### • Chemistry content is necessary, but not sufficient.

Games are about challenges and fun. You must create a game that people will want to play. You don't want to make it too easy nor too difficult. You want people to look forward to the game. You also want them to complete the game and want to play another round. The game should help people learn chemistry concepts but it shouldn't be identical to a school quiz or test. Being creative and making the game both fun, challenging and educational is what makes this periodic table game such an exciting challenge.

### • Manage Your Time

You have a sense of how you want to proceed and what you want the final product to be. You now have to allocate the work. How much time do you have to complete the project? When is the presentation? How will you get everything done in this timeframe? Who will be working on the game equipment and who will be working on the instructions? How will you ensure that each member's work meets the standard of excellence so that everybody on the team gets an A? Create a time chart for the challenge. Divide the responsibilities. How much time will each take? Some work can be done individually as homework. Leave time to review each other's work.

Planning a project well does not ensure success, but poor planning almost always leads to disappointment.

## Engineering/Technology Design

Reflect on the engineering/technology design process. Recall the successes and disappointments from the *mini-challenge*. How can you use the feedback that you received to improve your show? At this point, you are starting the design cycle again.

*Have fun with the periodic-table game!*

