

# Periodic Table Battleship – Open Inquiry

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## OBJECTIVE:

Showcase how much you know and understand the elements (& their properties) and the periodic table!

## LEARNING GOALS

In this activity, you will:

1. seek patterns.
2. classify and describe properties of different elements.
3. collaboratively plan and strategize.
4. generate their own questions using appropriate scientific terminologies.
5. collect evidence to support the answers they develop.
6. critically process and analyze information.
7. evaluate the approaches used to solve problems.

I would tell you a  
chemistry joke ...  
but all the good ones



## MATERIALS NEEDED – What equipment and supplies do I need?

1. 2 legal-sized file folders
2. 4 periodic tables, black and white
3. double-sided tape
4. 4 paper clips
5. pencil crayons
6. 2 dry erase markers
7. 1 dry eraser
8. recorder sheet
9. 4 transparency sheets

## IMPLEMENT – Carry out the activity

### Part 1 (Preparation) – Each team will consist of 2 students.

1. Provide 2 periodic tables (printed in black and white) to each team. Each student is responsible for one periodic table.
2. Learn the classification of elements and seek as many patterns and trends on the periodic table.
  - Examples
    - **Characteristics**
      - Period (similarities/differences), family (similarities, differences), how it was named (place, person, latin), distinguishing between metals, non metals and semi-metals, where atomic # comes from, where atomic mass comes from, how is ion charge determined, is it natural or synthetic etc.

3. Students can colour and/or label their periodic tables in whichever way they and their partner choose to as long as both periodic tables are done in exactly the same way.
4. Bring both periodic tables to class for Part 2 of the activity.

At the end of this part of the activity, each team should be prepared with some basic knowledge of elements on the periodic table and the arrangements of the modern periodic table before carrying out Part 2 of the activity.

## Part 2 (Battleship Day) – Groups of four (i.e. 2 teams of 2 students). Instructions

In this part of the activity, each team will formulate their own descriptive questions relating elements' properties and characteristics to try and guess the location of their opponents' ships. The first team to sink all of the opponents' ships wins!

1. Create a battleship board by sliding in a periodic table on each inner side of the file folder under the transparency.
2. Secure the two battleship boards back-to-back together with a few paper clips. See image below.
3. Each team will mark **FOUR** ships using a dry erase marker on the lower (horizontal/flat side) periodic table.
  - Ships must be placed either vertically or horizontally, **not diagonally**. Each ship must span over a minimum of 2 elements, and they can be anywhere on the periodic table, including the lanthanides and actinides.
  - The length of the ships must vary from each other
    - **You should have 2 ships that cover two elements, 2 ships that cover 3 elements, 1 ship that covers 4 elements and 1 ship that covers 5 elements for a total of 6 ships. Each ship should have a name relating to the elements involved so when the opposing team sinks it you will exclaim “YOU SUNK MY \_\_\_\_\_”**
      - **Ex: You sunk my Beryllium Destroyer”**
  - Ships cannot overlap each other and cannot be placed on another ship.
  - **Once the game begins, the location for each ship is locked in place and cannot be changed.**



4. Decide who will go first by playing rock-paper-scissors
5. Each team takes turns asking their opposing team questions about the possible positions for their ships.
  - Instead of calling out the coordinates as in regular Battleship, teams will describe the properties of the elements and/or the arrangement of the periodic table and phrase it in a **yes-no** question.
    - **Example:**
      - **Is your ship on an element from the halogen family?**
      - **Is your ship on a metal?**
      - **Is your ship on an element that turns into diamonds when under high temperature and pressure?**
  - Teams cannot use the following terms: ***element name, symbol, atomic number, atomic mass, row, and column.***
  - Coordinate-type of question can only be used once!
  - Unclear questions or improper phrasing of questions will cost the team to lose a turn!
6. **One player from each team will record and keep track of all the questions** that are asked during the game on a piece of paper provided by the teacher. The other player will record their team's guesses on the upper (vertical side) periodic table.

**Write down all the questions on the recording sheet, and the mark your team's guesses on the upper periodic table.**

  - "Miss" - "X"
  - "Hit" - "✓"
7. When a team has all of the "elements" in an opponent's hit, the opposing team will announce that a ship has been sunk. By exclaiming "YOU SUNK MY \_\_\_\_\_"
8. The game ends when either all the opposing team's ships are sunk or when time runs out and whichever team having the most points wins the game!





