***Periodic Table Cards***

*By: David Kleiman*

***Purpose:*** This activity is designed to allow students to simulate the process used by Dmitri Mendeleev to generate the first periodic table. Students will engage in solving a puzzle which reveals a periodic-table-like pattern when the cards are arranged by their known properties.

***Background:*** This activity works best if students are NOT made aware of any background information before the begin. Once all groups have completed puzzle you should explain that they have derived a sort of periodic table in nearly the same way as the original table was made by Dmitri Mendeleev in 1869. Mendeleev listed several properties of each of the known elements of his time onto paper cards. For example, he included measures such as relative atomic weight, melting point, boiling point, density, and combining capacity. He arranged these cards in rows by increasing atomic weight and began a new row when properties began to repeat themselves. Several other scientists had already independently derived similar tables. Mendeleev’s table was unique in that he left gaps In places where an he believed undiscovered elements may be located. Furthermore, he then made precise predictions about the properties of these undiscovered elements such as gallium and germanium which were later discovered.

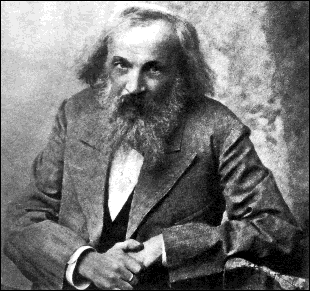
***Activity:*** Use a set of cards which have 3 distinct properties each:

1. a number
2. a coloured line
3. a shape cut out from the side

Students are asked to arrange the cards like a puzzle in ANY way so that all of the cards are aligned in such a way that ALL THREE of the properties of the cards form a pattern with each other. Before giving the students the puzzle cards, remove one of the cards from the set.

Once the puzzles are solved, relate their configuration to the configuration of the periodic table. Explain the story of Dmitri Mendeleev and how it relates to this activity.  
  
 Now ask the students to predict the three characteristics of their missing puzzle piece. Relate this to Mendeleev’s bold scientific predictions about undiscovered elements.

\*\* Attached are templates that can be printed in colour, on thick paper to create your own sets of cards.\*\*

 *Dmitri Mendeleev*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 |  |  |  | 3 | 4 |
| 5 | 6 | 7 |  |  | 8 | 9 |
| 10 | 11 | 12 |  | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 |  |  |  | 4 |
| 5 | 6 | 7 |  |  |  | 8 |
| 9 | 10 | 11 | 12 |  | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  | 2 |
| 3 | 4 | 5 |  |  | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |