Introduction to the elements: the Periodic Table

The conventional Periodic Table is an organiser that arranges the chemical elements into Groups (columns) and Periods (rows)

1. **Arrange** your samples on an enlarged copy of the Periodic table.

(a) How many elements are there in the Periodic Table? \_\_\_\_\_\_\_

(b) How many elements are there in your collection? \_\_\_\_\_\_\_\_\_

2. **Suggest** an explanation for the absence of elements in Group

(a) 1

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(b) 17 (7A)/ 18 (8A)

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3. **Organise** the element collection into their Periods. (Hint! Check their atomic numbers!)

(a) How many periods are represented by the collection? \_\_\_\_\_\_\_\_

(b) What might be an explanation for the lanthanide elements being shown at the bottom of a ‘conventional’ representation of the Periodic table?

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4. **Suggest** an explanation for the absence of elements in the collection from Period 7. What are some characteristics common to these ‘heavy’ elements?

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5. Check images under ‘*alternative representations of the periodic table*’ online.

(a) **Compare and contrast** these representations with the conventional Periodic Table.

(b) **Suggest** oneadvantage for three examples of an alternative visualisation.

6. Early attempts by Johann Wolfgang Döbereiner (1780-1849) and Johan Friedrich Gmelin (1748-1804) to organise the known elements of their time according to similarities of their chemistry found ‘triads’ (groups of three), tetrads (4s) and a pentad (5).

(a) **Find** examples in your collection of elements that can be arranged to form **triads**.

(b) For each these examples, identify similar physical properties (e.g., appearance, visually or density by measurement)

Modelling Mendeleev –

A recommended teacher resource:

<https://www.nsta.org/science-teacher/science-teacher-october-2019/patterns-puzzles-and-periodic-table>

PDF copy of the cards here:

<https://www.wpi.edu/sites/default/files/docs/Events/Annual-Events/AweSTEM/puzzle_print.pdf>

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