Student's Learning Activities
(Mendeleev and the Periodic System)

Activity 1

You will watch a video with narration or listen to a story from your teacher for the Mendeleev and his work about the classification of the chemical elements. Please write down the main points of the story, in your view, and discuss about them in your group. (Indicative important points of the story: the way of the classification of the chemical elements, the innovative points of Mendeleev's classification in correlation the other classifications, the Mendeleev's view for his classification, ….)

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Activity 2

a. Please visit the website: http://corrosion-doctors.org/Periodic/Periodic-Mendeleev.htm and write down the most important information about for the periodic system of chemical elements according to the classification of Mendeleev.

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b. Please discuss in your group and write: the chemical elements which Mendeleev placed on the first horizontal line and the seventh column of his periodic table and the elements which were discovered in the ancient years.

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c. Based on the research in the web, please describe Dobereiner's classification. Please write the elements which classified.

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Activity 3

Please discuss about the importance of the classification of chemical elements and their impact on the production of new chemical by Mendeleev's classification systems as well as the importance of prediction as a process of science.

Activity 4

Please visit the website:
http://corrosion-doctors.org/Periodic/Periodic-Mendeleev.htm
http://www.livepedia.gr/index.php/%CE%A0%CE%B5%CF%81%CE%B9%CE%BF%CE%B4%CE%B9%CE%BA%CF%8C_%CE%A3%CF%8D%CF%83%CF%84%CE%B7%CE%BC%CE%B1
Compare the contemporary periodic system with that of Mendeleev's. Write the similarities and the differences between the two systems.

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Please write down the chemical elements of the family of oxygen according to:
The classification of Mendeleev and according to the contemporary classification. Compare the two classifications.

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Activity 5

Please visit the website:
http://corrosion-doctors.org/Periodic/Periodic-1.htm#Development
and record the evolution of the periodic table from 1700 up today. One could notice that many chemicals had been identified during the period: 1800 -1899. Based on this website and especially on the following text please try to explain this fact.
"At this point one may ask why in the 1860ies that many chemists came up with different schemes to classify the elements. One probably very relevant aspect in this respect was the outcome of the collaboration of Robert Wilhelm Bunsen and Gustav Robert Kirchhof. They developed the spectroscopic method which enabled researchers to identify several new elements. The more elements were known to chemists, the easier it became to find substances that behaved similar".

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Activity 6

Based on the following text:
"At the end of the 1860ies, two different researchers independently came up with a very similar approach to arrange the chemical elements: Lothar Meyer uand Dmitri Mendeleev. Meyer first published his account in December 1869 in the Annalen für Chemie und Pharmazie, Mendeleev published a detailed paper in 1871 in the same journal without any reference to Meyer's work. Yet, it turned out that this was not Mendeleev's first publication of his understanding, he had already published a description of his work in March 1869 in a Russian journal and thus could claim priority rights."
Please write how science functions.

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Activity 7

Using the list of ideas that describe the characteristics of science and the ways it develops, try to locate and write these ideas in the story you heard and the above activities. These characteristics that scientists call Nature of Science (NOS) McComas (2004) are:

Characteristics of Nature of Science (NOS)

1. Science demands and relies on empirical evidence.
2. Knowledge production in science includes many common features and shared habits of mind.
3. Scientific knowledge is tentative but durable.
4. Laws and theories are related but distinct kinds of scientific knowledge.
5. Science is a highly creative endeavor.
6. Science has a subjective element.
7. There are historical, cultural, and social influences on science.
8. Science and technology impact each other, but they are not the same.
9. Science and its methods cannot answer all questions.

Scientists argue that in order to learn science one must first understand what exactly science is. Because it is difficult to define science, scientists give a list of its characteristics.

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