**PERIODIC TABLE OF THE ELEMENTS**

1. **Read the text on elements classification development throughout the history and**
2. Find the words or phrases (listed in the order as they appear in the text) that mean:

|  |  |  |  |
| --- | --- | --- | --- |
|  | dobývat, těžit |  | přidělen |
|  | navrhnout |  | vztahující se k |
|  | filozof |  | zásluha za… |
|  | destilovat |  | na základě |
|  | zařící |  | sjednocující |
|  | je považován za |  | vzorec, vzorce |
|  | učebnice |  | hydrid |
|  | rozlišit |  | oxid |
|  | vyžadovat |  | opakování |
|  | podle pořadí |  | konstatovat, prohlásit |

1. Then match the stages with the names

|  |  |
| --- | --- |
| the four roots | Plato |
| the four elements | Lavoisier |
| Philosopher’s Stone | Boyle |
| an element defined as a substance  that cannot be broken down into  a simpler substance | Aristotle |
| elements divided into metals/non-metals | Newlands |
| discovering “triads” | Mendeléev |
| the law of octaves | Döbereiner |
| arranging elements in the order of their increasing atomic masses | Brand |

1. Answer the questions below:
2. What was originally meant by the 4 elements?
3. How was phosphorus discovered?
4. Which book is considered to be the first modern chemical textbook?
5. Which branch of chemistry developed rapidly in the 19th century?
6. Why was Newland’s law called the law of octaves?
7. What was Mendeleév’s attitude towards his mother?
8. Why were hydrides and oxides important for Mendeleév and the way he classified elements?
9. **Listening. Listen to the song of the elements by Tom Lehrer and fill in the gaps.**

|  |  |
| --- | --- |
| There’s antimony, arsenic, aluminum, selenium,  And hydrogen and and nitrogen and rhenium. And nickel, neodymium, neptunium, germanium,  And , americium, ruthenium, uranium,  Europium, zirconium, lutetium, vanadium, And lanthanum and osmium and astatine and \_\_\_\_\_\_\_\_\_\_\_\_\_ .  And gold, protactinium and indium and gallium,  And and thorium and thulium and thallium. | There’s holmium and helium and hafnium and erbium,  And and francium and fluorine and terbium.  And manganese and mercury, molybdenum,\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Dysprosium and scandium and cerium and cesium,  And lead, praseodymium, and platinum, plutonium,  Palladium, promethium, , polonium,  Tantalum, technetium, titanium, tellurium,  And cadmium and and chromium and curium. |
| There’s yttrium, ytterbium, actinium, . And boron, gadolinium, niobium, iridium.  And strontium and and silver and samarium,  And bismuth, bromine, lithium, beryllium and barium. | There’s sulfur, californium and fermium, berkelium,  And also mendelevium, einsteinium and nobelium.  And argon, , neon, radon, xenon, zinc and rhodium,  And chlorine, carbon, cobalt, copper,  Tungsten, tin and . |
|  | These are the only ones of which the news has come to Harvard,  And there may be many others but they haven’t been discovered. |

1. **Put the number of the definition from the list below into the square** with the appropriate term**.** Check your answers by adding the numbers to see if all the sums of all rows, both across and down add up to the same number, the Magic Number.

|  |  |  |
| --- | --- | --- |
| PERIODS | ATOMIC NUMBER | SYMBOL |
| FAMILIES | VALENCE | NEUTRON |
| ELECTRON | MASS NUMBER | PROTON |

1. positive subatomic particle
2. vertical columns on the periodic table
3. number of protons in an element
4. the electrons in the outermost energy level
5. represents an element
6. negative subatomic particle
7. horizontal rows on the periodic table
8. number of protons and neutrons
9. neutral subatomic particle
10. **Find the following chemical elements, there are 15 of them.** If you cross all of them, the remaining letters, if read from left to right, form a word. Which word is it?

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | E | F | G | H | I |
| 1 | C | A | R | B | O | N | I | T | E |
| 2 | A | L | U | M | I | N | I | U | M |
| 3 | L | E | B | S | L | E | M | M | E |
| 4 | C | K | I | N | O | E | N | N | T |
| 5 | I | C | D | R | R | D | A | E | L |
| 6 | U | I | I | C | O | Z | I | N | C |
| 7 | M | N | U | R | A | N | I | U | M |
| 8 | S | R | M | O | S | M | I | U | M |
| 9 | Y | T | T | E | R | B | I | U | M |

/´ælthinspə’mɪnthinspithinspəm/ /’ɒzthinspmithinspəm/ /’mɜrthinspkyəthinspri/

/’kælthinspsithinspəm/ /ru’bɪdthinspithinspəm/ /’nithinspɒn/

/’kɑrthinspbən/ /’soʊthinspdithinspəm/ /ɪ’tɜrthinspbithinspəm/

/’aɪthinspən/ /tɪn/ /’nɪkthinspəl/

/lɛd/ /yʊ’reɪthinspnithinspəm/ /zɪŋk/

**5. ARSENIC. Watch the video and note down the uses of arsenic.**3

**6. Read the text about Arsenic. After you have read it complete the table with suitable information**

**ARSENIC**

|  |  |
| --- | --- |
| **Arsenic** is the [chemical element](http://en.wikipedia.org/wiki/Chemical_element) that has the symbol As, [atomic number](http://en.wikipedia.org/wiki/Atomic_number) 33 and atomic mass 74.92. Arsenic was first documented by [Albertus Magnus](http://en.wikipedia.org/wiki/Albertus_Magnus) in 1250. The element is a steel grey, very brittle, crystalline solid.  Arsenic is a poisonous element that occurs in the earth’s crust. It is [metalloid](http://en.wikipedia.org/wiki/Metalloid) with many [allotropic](http://en.wikipedia.org/wiki/Allotropy) forms, including a yellow (molecular non-metallic) and several black and grey forms (metalloids). Three metalloidal forms of arsenic, each with a different crystal structure, are found free in nature. The most stable of arsenic'sisomers is 68mAs with a half**-**life of 111 seconds.  In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds. The most common [oxidation states](http://en.wikipedia.org/wiki/Oxidation_state) for arsenic are −3 ([arsenides](http://en.wikipedia.org/wiki/Arsenide" \o "Arsenide): usually alloy-like intermetallic compounds), +3 (arsenates(III) or [arsenites](http://en.wikipedia.org/wiki/Arsenite), and most organoarsenic compounds), and +5 ([arsenates](http://en.wikipedia.org/wiki/Arsenate): the most stable inorganic arsenic oxycompounds). Arsenic and its compounds are used as [pesticides](http://en.wikipedia.org/wiki/Pesticides), [herbicides](http://en.wikipedia.org/wiki/Herbicide), [insecticides](http://en.wikipedia.org/wiki/Insecticide) and in various [alloys](http://en.wikipedia.org/wiki/Alloy).  Arsenic is made on an industrial scale by heating appropriate minerals in the absence of air. The arsenic is condensed out as a solid.  FeAsS (700°C) → FeS + As(g) → As(s)  Upon heating arsenic sublimes. You may be exposed to arsenic by: taking in small amounts in food, water or air; burning smoke from arsenic-treated wood; living in an area with high levels of arsenic in rock; working in a job where arsenic is made or used.  Exposure to arsenic can cause many health problems. Being exposed to low levels for a long time can change the colour of your skin. Exposure to high levels of arsenic can cause death. | **1**  **2**  **3**  **4**  **5**  **6**  **7** |

|  |  |
| --- | --- |
| **Symbol** |  |
| **Atomic number** |  |
| **Atomic mass** |  |
| **Properties** |  |
| **Occurrence** |  |
| **Types of compounds** |  |
| **Uses** |  |
| **Effects of Exposure** |  |

**7. Now read the text again and complete the second chart with words needed for a description of an element.**

|  |  |  |
| --- | --- | --- |
| **Nouns/Noun Phrases** | **Verbs/Verb Phrases** | **Adjectives** |
| *symbol* | *occurs* | *crystalline* |

**8. Translate the words/phrases into English**

|  |  |
| --- | --- |
| **Vocabulary – Periodic Table of the Elements** | |
|  | otáčet se |
|  | tekutina |
|  | sloučeniny a směsi |
|  | bod varu / tání |
|  | bod kondenzace |
|  | bod mrazu |
|  | zkapalnit / zkapalnění |
|  | alkalické kovy |
|  | kovy alkalických zemin |
|  | halogeny |
|  | chalkogeny |
|  | vzácné plyny |
|  | chemická značka |
|  | protonové číslo |
|  | poločas rozpadu |
|  | relativní atomová hmotnost |
|  | jedovatý |
|  | vyskytovat se |
|  | kov / polokov / nekov |
|  | slitina |
|  | množství |
|  | molekulární struktura |
|  | stabilní izotop |
|  | obvyklý |
|  | životní prostředí |
|  | reaguje s … a vytvoří… |
|  | být vystaven (np. chemikálii)/ vystavení se |
|  | ošetřit |
|  | způsobit |
|  | vysoké / nízké hladiny |
|  | vzorek |
|  | těkavý |
|  | zbavit se |
|  | prášek |
|  | plíseň |
|  | krmit dobytek |

**The lesson was adapted from Milada Pavlovová.Sources:**

<http://www.privatehand.com/flash/elements.html> , transcript http://www.edu- cyberpg.com/iec/elementsong.html

[www.wikipedia.org](http://www.wikipedia.org)

<http://www.youtube.com/watch?v=a2AbKwAvyos>

<http://dictionary.reference.com/help/luna/IPA_pron_key.html>

<http://www.nclark.net>

Useful website: www.webelements.com