

PERIODIC TABLE OF THE ELEMENTS

1. Read the text on elements classification development throughout the history and

A. 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

B. 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"	Mendeleev
the law of octaves	Döbereiner
arranging elements in the order of their increasing atomic masses	Brand

C. Answer the questions below:

- What was originally meant by the 4 elements?
- How was phosphorus discovered?
- Which book is considered to be the first modern chemical textbook?
- Which branch of chemistry developed rapidly in the 19th century?
- Why was Newland's law called the law of octaves?
- What was Mendeleev's attitude towards his mother?
- Why were hydrides and oxides important for Mendeleev and the way he classified elements?

2. Listening. Listen to the song of the elements by Tom Lehrer and fill in the gaps.

<p>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.</p>	<p>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.</p>
<p>There's yttrium, ytterbium, actinium, And boron, gadolinium, niobium, iridium. And strontium and _____ and silver and samarium, And bismuth, bromine, lithium, beryllium and barium.</p>	<p>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 _____.</p>
	<p>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.</p>

3. 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

4. **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

/ 'æ l ə 'mɪ n i ə m /

/ 'kæ l s i ə m /

/ 'kɑ r b ə n /

/ 'aɪ ə n /

/ l ɛ d /

/ 'bʒ m i ə m /

/ r u 'bɪ d i ə m /

/ 's oʊ d i ə m /

/ tɪ n /

/ ɣ ɔ 'r eɪ n i ə m /

/ 'm ɜ r k y ə r i /

/ 'n i ɒ n /

/ ɪ 't ɜ r b i ə m /

/ 'nɪ k ə l /

/ zɪ ŋ k /

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

<p>Arsenic is the chemical element that has the symbol As, atomic number 33 and atomic mass 74.92. Arsenic was first documented by Albertus Magnus in 1250. The element is a steel grey, very brittle, crystalline solid.</p>	1
<p>Arsenic is a poisonous element that occurs in the earth's crust. It is metalloid with many allotropic forms, including a yellow (molecular non-metallic) and several black and grey forms (metalloids). Three metalloid forms of arsenic, each with a different crystal structure, are found free in nature. The most stable of arsenic's isomers is ^{68m}As with a half-life of 111 seconds.</p>	2
<p>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 for arsenic are -3 (arsenides: usually alloy-like intermetallic compounds), +3 (arsenates(III) or arsenites, and most organoarsenic compounds), and +5 (arsenates: the most stable inorganic arsenic oxycompounds). Arsenic and its compounds are used as pesticides, herbicides, insecticides and in various alloys.</p>	3
<p>Arsenic is made on an industrial scale by heating appropriate minerals in the absence of air. The arsenic is condensed out as a solid.</p>	4
<p style="text-align: center;">$\text{FeAsS} (700^\circ\text{C}) \rightarrow \text{FeS} + \text{As}(\text{g}) \rightarrow \text{As}(\text{s})$</p>	5
<p>Upon heating arsenic sublimates. 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.</p>	6
<p>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.</p>	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
<i>symbol</i>	<i>occurs</i>	<i>crystalline</i>

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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.youtube.com/watch?v=a2AbKwAvyos>
http://dictionary.reference.com/help/luna/IPA_pron_key.html



<http://www.nclark.net>

Useful website: www.webelements.com