9D Science
Harris

Name: _____
Date: _____

## PRACTICE QUESTIONS: Elements

1.

**Element Symbols:**

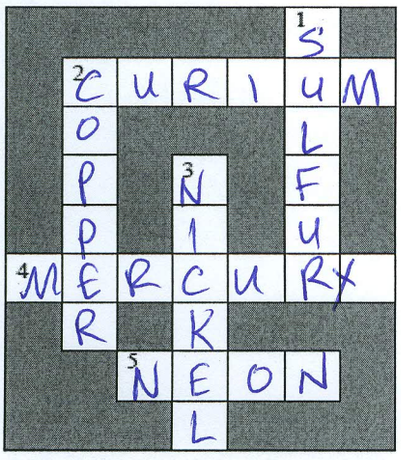
An *element symbol* is an abbreviation for the name of an element. A symbol can have one or two letters. The *first* letter of a symbol is *always capitalized*. The second letter (if there is one) is never capitalized. Symbols for the naming of elements are part of an *international* language. Chemists all over the world use the same symbols.

Complete the following table by filling in the missing word or symbol.

| Element | Symbol | Element | Symbol |
|---|---|---|---|
| Carbon | C | Chlorine | Cl |
| Hydrogen | H | Copper | Cu |
| Oxygen | O | Gold | Au |
| Nitrogen | N | Silver | Ag |
| Sulfur | S | Helium | He |
| Iodine | I | Aluminum | Al |
| Iron | Fe | Calcium | Ca |
| Lead | Pb | Neon | Ne |
| Mercury | Hg | Potassium | K |
| Phosphorus | P | Sodium | Na |

2.

**Element-ary Crossword Puzzle:**




1. Down: a yellow element that stinks when burned
2. Down: a reddish-orange element used for electrical wiring
2. Across: element named after a female scientist
3. Down: an element that is a coin
4. Across: name of an element and the closest planet to the sun
5. Across: an element (gas) used to make colorfully lit advertising signs

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3. Define the terms element and compound. Provide three examples of each, and draw a diagram of each that illustrates the main difference between these terms.

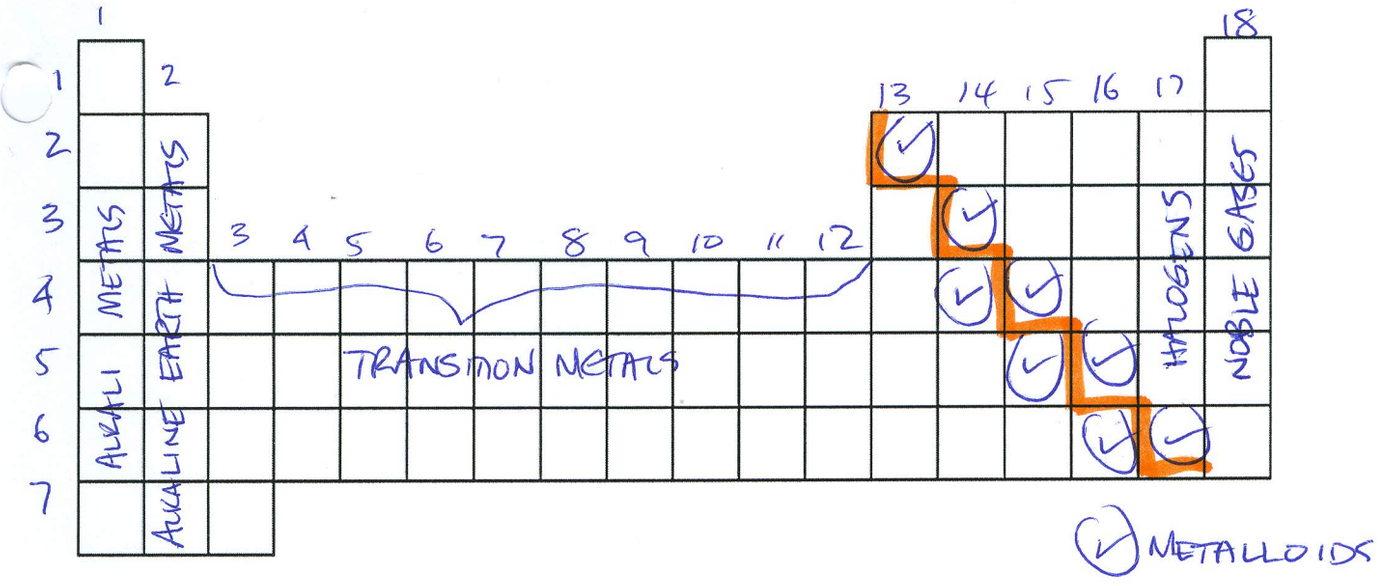
ELEMENT → A pure substance that cannot be broken down further by chemical means. eg C, Oxygen, He
(an atom of He) O=O (a molecule of oxygen)

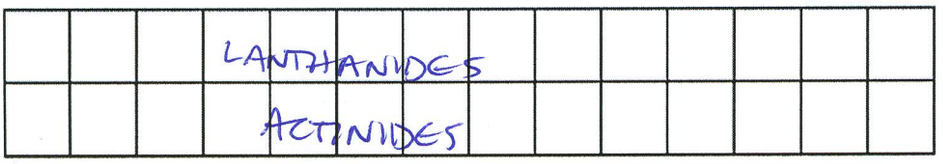
COMPOUND → A pure substance that can be broken down further by chemical means. eg $CO_2$, $H_2O$, NaCl
(a molecule of water)

## PRACTICE QUESTIONS: The Periodic Table

4. On the periodic table template below, label the following:

| | |
|---|---|
| Families 1-18 ✓ | Staircase line ✓ |
| Periods 1-7 ✓ | Halogens ✓ |
| Alkali Metals ✓ | Noble gases ✓ |
| Alkaline Earth Metals ✓ | Lanthanides ✓ |
| Transition Metals ✓ | Actinides ✓ |
| Metalloids ✓ | |



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HOW DO I WRITE MULTIPLE CHOICE QUESTIONS???:

- Read the questions carefully.
- Review ALL options.
- Eliminate options that you are certain are incorrect.
- Choose the best answer from the options remaining

5. Jason noticed that the periodic table had coloured sections. The seven elements between the metal and non-metal sections had their own colour. They represent a group called:

A. halogens
B. metalloids
C. intermediates
D. mid-elements

6. Ashton noticed that Cu, Zn and Ga are in the same horizontal row in the periodic table. She concluded that these three elements belong to the same:

A. family
B. period
C. group
D. section

7. Which term best-describes an atom?

A. largest part of a element
B. smallest part of a element
C. a particle that is larger than a molecule
D. part of the nucleus

8. What is an element?

A. a pure substance made up of one type of atom
B. a pure substance made up of 2 or more types of atoms
C. the periodic table
D. a compound made up of 1 type of element

9. What is a compound?

A. a pure substance made up of one type of atom
B. pure substances made up of 2 or more types of atoms
C. a substance made up of 10 atoms
D. All of the above

10. Which of these elements are extremely reactive, silver-coloured and lustrous?

Metals

A. Transition Metals
B. Alkaline-earth Metals
C. Alkali Metals
D. Halogens

11. Which of these elements are slightly less reactive than Alkali Metals?

A. Alkali Metals
B. Transition Metals
C. Lanthanides
D. Alkaline-earth Metals

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12. Which of these elements are shiny and good conductors of heat and electricity?

A. Actinides
B. Transition Metals
C. Metalloids
D. Family 18 elements

13. Which of these elements are unreactive, colourless and odourless at room temperature?

A. Metalloids
B. Halogens
C. Noble Gases
D. Alkaline Earth Metals

14. The vertical columns on the periodic table are called _____.

A. metals
B. non-metals
C. periods
D. groups/families

15. The horizontal rows on the periodic table are called _____.

A. gases
B. solids
C. periods
D. families

## PRACTICE QUESTIONS: Atomic Structure

16. Several models of what the atom may have looked like were made. The earliest model, representing the atom as a positively charged sphere in which negatively charged electrons were embedded, was developed by:

A. Bohr
B. Thomson
C. Dalton
D. Rutherford

17. "It's like shooting a gun shell at a place of tissue paper and it comes back right at you." These famous words were said by:

A. Dalton
B. Thomson
C. Rutherford
D. Chadwick

18. What does the atomic number of an atom represent?

A. protons and electrons indirectly, if atom is neutral.
B. protons and neutrons
C. neutrons and electrons
D. electrons and energy levels

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. What are the parts of an atom?

A. nucleus, element, carbon, space
B. ions, electrons, neutrons, water
C. protons, neutrons, electrons, nucleus
D. protons, neutrons, nucleus, mass

20. Since atoms are neutral, the number of electrons is equal to the number of:

A. neutrons
B. protons
C. nucleus
D. ions

+ = −

21. How do you calculate the number of neutrons in an atom?

A. the atomic mass plus the number of protons
B. the atomic mass subtracted the number of protons
C. the atomic mass plus the number of electrons
D. the atomic mass subtracted the number of electrons

mass number minus

22. How many electrons are allowed in the 1st, 2nd and 3rd energy levels in a Bohr-Rutherford Diagram?

A. 1st: 2 2nd: 4 3rd: 4
B. 1st: 2 2nd: 5 3rd: 7
C. 1st: 3 2nd: 9 3rd: 9
D. 1st: 2 2nd: 8 3rd: 8

23. In the periodic table the element chlorine appears in a box containing important information. What does the number 17 in the box indicate?

A. atomic mass
B. mass number
C. atomic symbol
D. atomic number

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24. Complete the chart below. Assume neutral atoms

| Element Name | Nuclear Notation | Family Number | Period Number | Atomic Number | Mass Number | # p+ | # e- | # n |
|---|---|---|---|---|---|---|---|---|
| Carbon | $^{12}_{6}C$ | 14 | 2 | 6 | 12 | 6 | 6 | 6 |
| Silicon | 30 Si 14 | 14 | 3 | 14 | 30 | 14 | 14 | 16 |
| Zinc | $^{65}_{30}Zn$ | 12 | 4 | 30 | 65 | 30 | 30 | 35 |
| Silver | $^{108}_{47}Ag$ | 11 | 5 | 47 | 108 | 47 | 47 | 61 |
| Gold | $^{197}_{79}Au$ | 11 | 6 | 79 | 197 | 79 | 79 | 118 |

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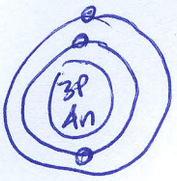
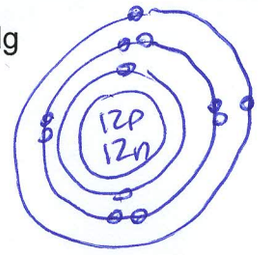
25. (I) Draw a Bohr-Rutherford Diagram and an electron-dot diagram for the following elements:

(a) $^{7}_{3}$Li



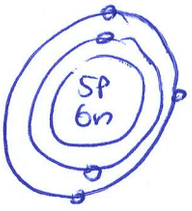

Li

(b) $^{24}_{12}$Mg



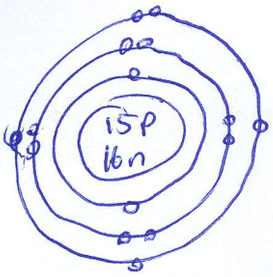

Mg

(c) $^{11}_{5}$B



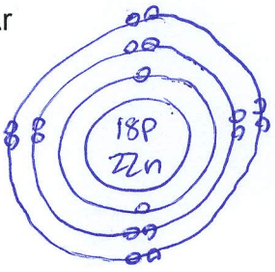

B

(d) $^{31}_{15}$P




P

(e) $^{40}_{18}$Ar

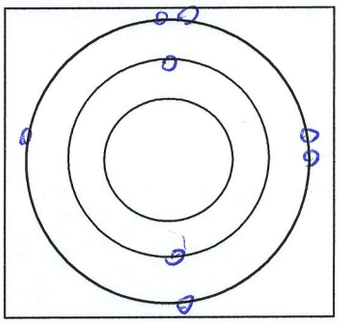



Ar

(II) What do the Bohr-Rutherford Diagrams and electron-dot diagrams have in common?

Same number of "valence e⁻"

(III) Consider the Bohr-Rutherford Diagram shown:



(a) In what period is this element? How can you tell?

2 → 2 energy levels

(b) In what family is this element? How can you tell?

16 → 6 valence e⁻

(c) Draw the electron-dot diagram for this element.

X

26. Two atoms of the same element that differ only in number of neutrons are called ISOTOPES. An atom with an unequal number of electrons and protons is called an ION. If a neutral atom gains electrons, it has an overall − charge and is called an ANION. If a neutral atom loses electrons, it has an overall + charge and is called a CATION.

27. Complete the chart:

| | Proton | Electron | Neutron |
|---|---|---|---|
| Charge | + | − | ∅ |
| Location | nucleus | energy levels | nucleus |
| Relative mass | 1 | 1/2000 | 1 |