

Science 9

Unit 2: Chemical Reactions

Worksheet 7: What information is on the Periodic Table



Each Square on the periodic table contains the following information:

6	— Atomic number
C	— Symbol
Carbon	— Name
12.01	— Atomic mass

Atomic Number:

- The number of protons found in the nucleus of an atom
- Elements are organized on the table according to their atomic number. Therefore, no two elements have the same atomic number.
- Because an atom is neutral, it also indicates the number of electrons surrounding the nucleus of the atom

Symbols:

- All elements have their own unique symbol
 - It can consist of a single capital letter, or a capital letter and one or two lower case letters
- Examples:

Carbon	=>	C
Potassium	=>	K
Sodium	=>	Na
Gold	=>	Au

Atomic Mass:

- The number of protons and neutrons in the nucleus of an atom.
- Also referred to as Atomic Weight
- This number (rounded off) tells you the number of protons plus the number of neutrons.
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This information can also be display in a chemical symbol as shown below:

4	<u>Atomic mass</u>	the number of protons and neutrons in an atom
He		
2	<u>Atomic number</u>	the number of protons in an atom
number of electrons = number of protons		

How do I find the number of protons, electrons, and neutrons in an element using the periodic table?

of PROTON = ATOMIC NUMBER

of ELECTRONS = ATOMIC NUMBER

of NEUTRONS = ATOMIC MASS - ATOMIC NUMBER

PART A: MULTIPLE CHOICE

[32]

- The order of elements in the periodic table is based on
 - the number of protons in the nucleus.
 - the electric charge of the nucleus.
 - the number of neutrons in the nucleus.
 - atomic mass.
- What information in the periodic table indicates the number of protons in an atom?
 - the element's chemical symbol
 - the position of the element in its column
 - the element's atomic mass
 - the element's atomic number
- Magnesium (Mg) is located to the right of sodium (Na) because Mg has
 - fewer protons.
 - no protons.
 - no neutrons.
 - more protons.
- The atomic number of oxygen, 8, indicates that there are eight
 - protons in the nucleus of an oxygen atom.
 - oxygen nuclides.
 - neutrons outside the oxygen atom's nucleus.
 - energy levels in the oxygen atom's nucleus
- The elements in a column of the periodic table
 - have similar properties.
 - are in the same period.
 - have very similar chemical symbols.
 - have the same atomic mass.
- The order of elements in the modern periodic table is based on an element's
 - atomic number.
 - name.
 - chemical symbol.
 - atomic mass
- Which pair must represent atoms of the same element?
 - ${}^{14}_6X$ and ${}^{14}_7X$
 - ${}^{12}_6X$ and ${}^{13}_6X$
 - 2_1X and 4_2X
 - ${}^{13}_6X$ and ${}^{14}_7X$
- In all samples of the element potassium, each atom has
 - 19 protons
 - 20 neutrons
 - 39 protons and neutrons
 - 39 nucleons

9. The atomic number of an atom is
- (A) The mass of the atom
 - (B) The number of protons added to the number of neutrons
 - (C) The number of protons
 - (D) Negatively charged
10. The total number of protons and neutrons in the nucleus of an atom is its
- (A) atomic number..
 - (B) Avogadro constant.
 - (C) mass number
 - (D) number of neutrons
11. The periodic table shows that a carbon atom has six protons. This means that a carbon atom also has
- (A) Six electrons
 - (B) Six neutrons
 - (C) More protons than electrons
 - (D) An atomic mass that equals six
12. How many electrons does **Fluorine** have?
- (A) 5
 - (B) 9
 - (C) 12
 - (D) 4
13. How many neutrons does one atom of Helium have?
- (A) 2
 - (B) 4
 - (C) 3
 - (D) 0
14. How many protons does one atom of **H** have?
- (A) 0
 - (B) 1
 - (C) 2
 - (D) 20
15. An aluminum isotope consists of 13 protons, 13 electrons, and 14 neutrons. Its mass number is
- (A) 13
 - (B) 14
 - (C) 27
 - (D) 40
16. Zn-66 (atomic number 30) has
- (A) 30 neutrons.
 - (B) 33 neutrons.
 - (C) 36 neutrons.
 - (D) 96 neutrons.
17. Ag-109 has 62 neutrons. The neutral atom has
- (A) 40 electrons.
 - (B) 47 electrons.
 - (C) 53 electrons.
 - (D) 62 electrons

18. Silicon-30 contains 14 protons. It also contains
- (A) 16 electrons.
 - (B) 16 neutrons.
 - (C) 30 neutrons
 - (D) 44 neutrons.
19. Neon-22 contains 12 neutrons. It also contains
- (A) 12 protons.
 - (B) 22 proton s.
 - (C) 22 electrons.
 - (D) 10 protons.
20. The part of the atom where the electrons CANNOT be found is the
- (A) area surrounding the nucleus.
 - (B) nucleus.
 - (C) electron cloud.
 - (D) orbitals.
21. What is the mass number of an isotope of hydrogen consisting of 1 proton, 1 electron, and 2 neutrons?
- (A) 1
 - (B) 2
 - (C) 4
 - (D) 3
22. What is atomic mass?
- (A) protons + electrons
 - (B) electrons + neutrons
 - (C) neutrons + electrons
 - (D) protons + neutrons
23. Inside the nucleus of a ${}^{11}_5\text{B}$ atom are:
- (A) 5 protons and 6 neutrons
 - (B) 5 neutrons and 6 protons
 - (C) 5 protons and 5 electrons
 - (D) 5 protons and 11 neutron
24. What is the mass number of an element that has 19 protons, 19 electrons, and 20 neutrons?
- (A) 19
 - (B) 20
 - (C) 39
 - (D) 58
25. The number of neutrons in an atom of radioactive C – 14 is:
- (A) 6
 - (B) 12
 - (C) 8
 - (D) 14

26. What is the mass number of an isotope of hydrogen consisting of 1 proton, 1 electron, and 2 neutrons?
- (A) 1
 (B) 2
 (C) 3
 (D) 4

Use the chemical symbol below to answer questions 27 to 31

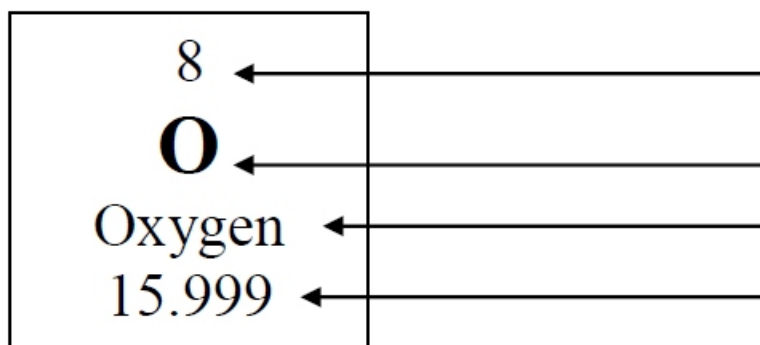


27. How many protons does this element have?
- (A) 28
 (B) 31
 (C) 59
 (D) 87
28. What is the atomic mass of this element?
- (A) 28
 (B) 31
 (C) 59
 (D) 87
29. What two sub atomic particles make up the number "59" in the chemical symbol?
- (A) protons + electrons
 (B) electrons + neutrons
 (C) neutrons + electrons
 (D) protons + neutrons
30. How many neutrons are found in an atom for this particular element?
- (A) 28
 (B) 31
 (C) 59
 (D) 87
31. Which of the following is correct for the above chemical symbol?

	electron	proton	neutron
(A)	28	28	31
(B)	28	31	28
(C)	31	28	28
(D)	31	31	28

32. What element does this represent?
- (A) Nickel
 (B) Praseodymium
 (C) Gallium
 (D) Copper

1. Label the information provided in the periodic table.



2. What does the atomic number represent?
 _____ or _____
3. What does the atomic mass represent?
 _____ + _____
4. How would you figure the number of protons or electrons in an atom?
5. How would you figure the number of neutrons in an atom
6. Complete the chart below for the following atoms:

Element	Chemical Symbol	Family	Group	Period	Atomic number	Number of Protons	Number of Electrons
	Li						
			2	4			
Gold							
					29		
Sodium							
			17	2			
	Ar						
			12	4			
					80		
					28		
	Ne						
			2	2			
	Ag						

7. A) Determine the number of neutrons in an atom of carbon if its mass number is 12. [2]

- B) Determine the mass number of an atom of sodium if it has 11 neutrons. [2]
