1. What is the center of an atom called?
   a) Electron
   b) Neutron
   c) Nucleus
   d) Shell

2. Which subatomic particle has a negative charge?
   a) Proton
   b) Neutron
   c) Electron
   d) Nucleus

3. How many electrons can the first energy level (shell) hold?
   a) 1
   b) 2
   c) 6
   d) 8

4. Which part of the atom determines the element's identity?
   a) Number of neutrons
   b) Mass number
   c) Number of protons
   d) Number of electrons

5. Which group on the periodic table contains the noble gases?
   a) Group 1
   b) Group 2
   c) Group 17
   d) Group 18

6. What is the charge on a proton?
   a) Positive
   b) Negative
   c) Neutral
   d) Variable

7. Oxygen has 8 protons. How many electrons does a neutral oxygen atom have?
   a) 6
   b) 7
   c) 8
   d) 9

8. What does the atomic number represent?
   a) Number of electrons
   b) Number of protons
   c) Number of neutrons
   d) Atomic mass

9. Which of the following is a compound?
   a) H
   b) O2
   c) H2O
   d) Na

10. What type of element is found on the left side of the periodic table?
    a) Nonmetals
    b) Noble gases
    c) Halogens
    d) Metals

11. How are elements arranged on the periodic table?
    a) By increasing atomic mass
    b) Alphabetically
    c) By increasing atomic number
    d) Randomly

12. Which of the following is a molecule?
    a) H
    b) NaCl
    c) O2
    d) Fe

13. The atomic mass of carbon is approximately 12. How many protons does carbon have?
    a) 12
    b) 6
    c) 18
    d) 0

14. What do we call atoms of the same element with different numbers of neutrons?
    a) Ions
    b) Molecules
    c) Isotopes
    d) Compounds

15. Which of the following is a diatomic molecule?
    a) CO2
    b) H2
    c) H2O
    d) NaCl

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16. Electrons are found in the nucleus of an atom.
17. Neutrons have no charge.
18. The periodic table is organized into periods (rows) and groups (columns).
19. Atoms can lose or gain protons during chemical reactions.
20. Molecules are made up of two or more atoms bonded together.

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21. Define “atom” in your own words.
22. What are the three main subatomic particles? State their charges and locations.
23. What is the difference between a molecule and a compound?
24. Draw a simple Bohr-Rutherford diagram for a neutral lithium atom (3 protons).
25. Explain what an ion is and give one example.
26. What does the mass number of an atom tell you?
27. What happens to the number of electrons when an atom becomes a positive ion?
28. Name one metal and one non-metal element from the periodic table.
29. What is a chemical formula? Give an example and explain what it shows.
30. How can you tell if a substance is an element or a compound just by its chemical formula?

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31. Magnesium has 12 protons and an atomic mass of 24. How many neutrons does it have?
32. A student says that CO and CO_2 are the same because they both contain carbon and oxygen. Do you agree? Explain why or why not.

33. Why is it important to understand atomic structure when learning about chemical reactions?

34. Predict how many electrons sodium (Na) will lose or gain in a reaction and explain why.

35. A compound contains two hydrogen atoms and one oxygen atom. What is its chemical formula and what type of molecule is it?