

**Student Name:** \_\_\_\_\_

**Class:** \_\_\_\_\_

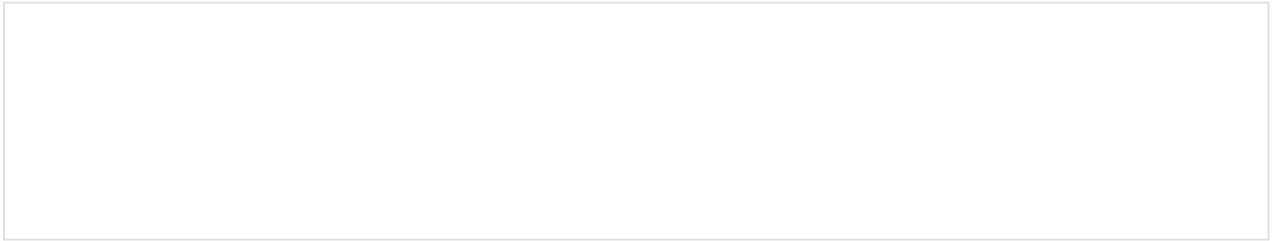
**Due Date:** \_\_\_\_\_

### Introduction

Welcome to the atoms and molecules homework sheet! This worksheet is designed to help you understand the basic structure of atoms, how atoms bond to form molecules, and the importance of these concepts in everyday life. Please complete the activities and questions to the best of your ability.

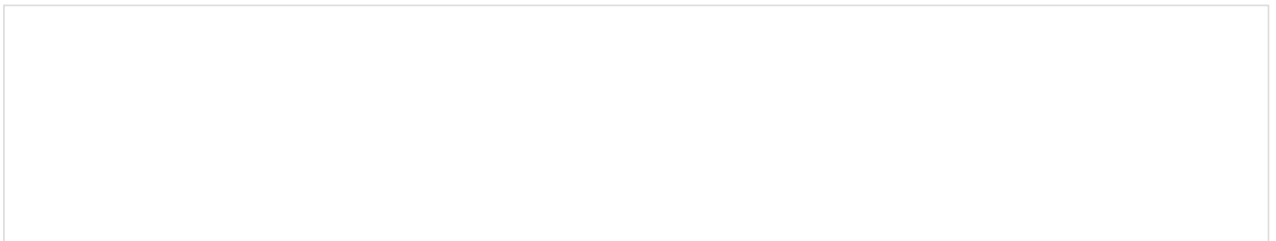
## Atomic Structure

1. Draw and label a diagram of an atom, including the protons, neutrons, and electrons.

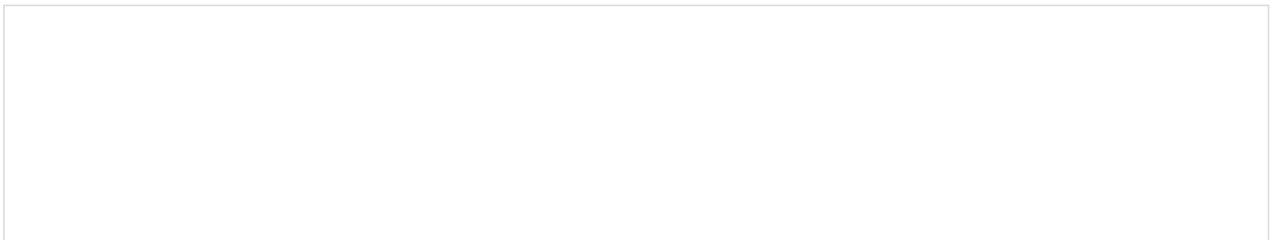


2. What is the role of each part of the atom?

- Protons: \_\_\_\_\_
- Neutrons: \_\_\_\_\_
- Electrons: \_\_\_\_\_



3. What is the atomic number of an element, and how is it related to the number of protons in an atom?



## Chemical Bonding

1. What is a chemical bond, and how do atoms form bonds with each other?

2. Describe the difference between ionic and covalent bonds.

3. Give an example of a molecule that is formed through ionic bonding and one that is formed through covalent bonding.

## Molecules

1. What is a molecule, and how is it different from an atom?

2. Draw the molecular structure of water ( $\text{H}_2\text{O}$ ) and label the atoms.

3. What is the molecular formula for carbon dioxide, and how many atoms of each element are present in one molecule?

## Real-World Applications

1. How are atoms and molecules relevant to your everyday life? Give at least two examples.

2. Research and write a short paragraph about a molecule that is important in your daily life, such as oxygen or glucose.

3. How do atoms and molecules contribute to the properties of materials, such as metals, plastics, or woods?

## Quiz Time!

1. What is the smallest unit of a chemical element?

- a) Molecule
- b) Atom
- c) Compound
- d) Mixture

2. Which type of bond involves the sharing of electrons between atoms?

- a) Ionic bond
- b) Covalent bond
- c) Hydrogen bond
- d) Electrostatic bond

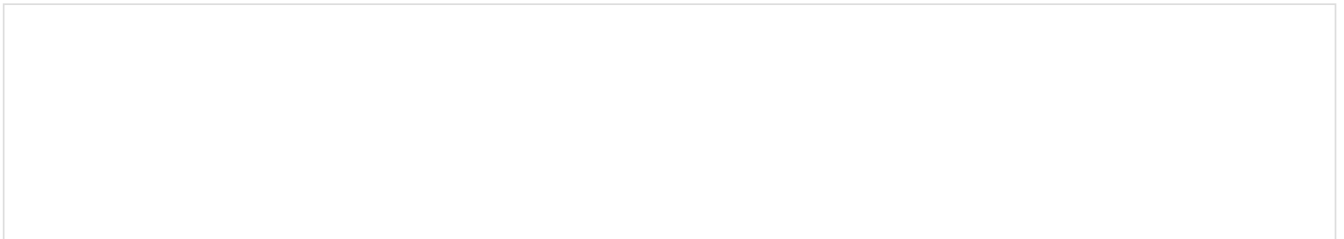
3. What is the molecular formula for water?

- a) H<sub>2</sub>O
- b) CO<sub>2</sub>
- c) O<sub>2</sub>
- d) H<sub>2</sub>

## Word Search

Find and circle the following words related to atoms and molecules:

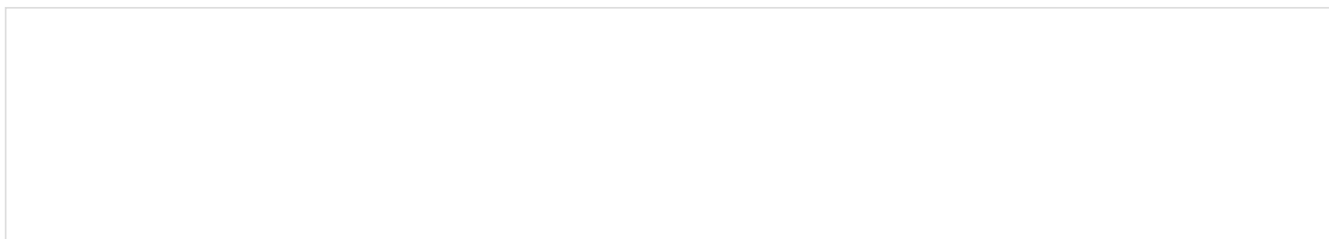
- Atom
- Molecule
- Bond
- Electron
- Proton
- Neutron
- Element
- Compound



## Crossword Puzzle

Complete the crossword puzzle using the following clues:

- Small unit of a chemical element (5)
- Type of bond that involves sharing electrons (8)
- Molecule made up of two hydrogen atoms and one oxygen atom (4)
- Particle with a positive charge (6)
- Type of bond that involves the transfer of electrons (7)



## Design a Molecule

Design and draw a molecule that could have a specific practical application, such as a new material for solar panels or a compound that could help in pollution cleanup. Explain the bonding between atoms and discuss potential properties and uses of your designed molecule.

### Reflection

Reflect on what you have learned about atoms and molecules. What did you find most interesting or challenging? How do you think this knowledge will help you in your future studies or career?

### Conclusion

Congratulations on completing the atoms and molecules homework sheet! We hope you have gained a better understanding of the basic structure of atoms, how atoms bond to form molecules, and the importance of these concepts in everyday life. Keep exploring and learning about science!