Exploring the Periodic Table: Understanding the First 20 Elements

Introduction

Introduction to the Periodic Table

Read the following introduction and answer the questions that follow:

The periodic table is a powerful tool used by chemists to organize and understand the properties of elements. In this worksheet, we will explore the first 20 elements of the periodic table, their symbols, atomic numbers, and properties.

1. What is the main purpose of the periodic table?

2. What will we be exploring in this worksheet?

Section 1: Element Symbols and Atomic Numbers

Matching Element Symbols and Atomic Numbers

Match the following element symbols with their corresponding atomic numbers:

Element Symbol	Atomic Number
Hydrogen (H)	_____
Helium (He)	_____
Lithium (Li)	_____
Beryllium (Be)	_____
Boron (B)	_____

Writing Element Symbols and Atomic Numbers

Write the symbol and atomic number of the following elements:

1. Oxygen - _____

2. Nitrogen - _____

3. Fluorine - _____

4. Neon - _____

Section 2: Element Properties

Identifying Element Properties

Identify the following elements as metals, nonmetals, or metalloids:

Element	Property
Sodium (Na)	_____
Carbon (C)	_____
Oxygen (O)	_____
Silicon (Si)	_____

Describing Element Properties

Describe the properties of the following elements:

1. Hydrogen (H) - _____
2. Helium (He) - _____
3. Lithium (Li) - _____

Section 3: Periodic Trends

Arranging Elements by Atomic Radius

Arrange the following elements in order of increasing atomic radius:

1. Sodium (Na)
2. Magnesium (Mg)
3. Aluminum (Al)

Identifying Electronegativity

Identify the following elements as having a high or low electronegativity:

1. Fluorine (F) - _____
2. Oxygen (O) - _____

3. Nitrogen (N) - _____

Section 4: Element Families

Identifying Element Families

Identify the following elements as belonging to the alkali metal, alkaline earth metal, or noble gas family:

1. Lithium (Li) - _____

2. Beryllium (Be) - _____

3. Helium (He) - _____

Describing Element Families

Describe the properties of the following element families:

1. Alkali metals - _____

2. Noble gases - _____

Section 5: Chemical Reactions

Predicting Chemical Reactions

Predict the outcome of the following chemical reaction:

Sodium (Na) + Chlorine (Cl) → _____

Balancing Chemical Equations

Balance the following chemical equation:

Hydrogen (H) + Oxygen (O) → _____

Conclusion

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In this worksheet, we have explored the first 20 elements of the periodic table, their symbols, atomic numbers, and properties. We have also examined periodic trends, element families, and chemical reactions. By completing this worksheet, you should have a better understanding of the periodic table and its applications.

Individual Reflection:

1. What was the most challenging part of this worksheet for you?
2. What did you learn about the periodic table and its applications?
3. How will you apply what you have learned in this worksheet to your future studies?

Answer Key

Section 1: Element Symbols and Atomic Numbers

1. Hydrogen (H) - 1
2. Helium (He) - 2
3. Lithium (Li) - 3
4. Beryllium (Be) - 4
5. Boron (B) - 5

6. Oxygen - O, 8
7. Nitrogen - N, 7
8. Fluorine - F, 9
9. Neon - Ne, 10

Section 2: Element Properties

1. Sodium (Na) - metal
2. Carbon (C) - nonmetal
3. Oxygen (O) - nonmetal
4. Silicon (Si) - metalloid

5. Hydrogen (H) - highly flammable
6. Helium (He) - noble gas
7. Lithium (Li) - highly reactive

Answer Key (Continued)

Section 3: Periodic Trends

1. Sodium (Na), Magnesium (Mg), Aluminum (Al)
2. Fluorine (F) - high
3. Oxygen (O) - high
4. Nitrogen (N) - medium

Section 4: Element Families

1. Lithium (Li) - alkali metal
2. Beryllium (Be) - alkaline earth metal
3. Helium (He) - noble gas

4. Alkali metals - highly reactive
5. Noble gases - unreactive

Answer Key (Continued)

Section 5: Chemical Reactions

1. Sodium (Na) + Chlorine (Cl) → Sodium Chloride (NaCl)
2. Hydrogen (H) + Oxygen (O) → Water (H2O)