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## Molecules and compounds worksheet answer key

### What's the difference atoms molecules elements and compounds worksheet answer key. Elements and compounds worksheet answers. Compounds worksheet answer key. Atoms elements molecules and compounds worksheet answer key.

An element is a substance that is composed entirely of one type of atom. Everything in the world is made up of them. Some common examples are oxygen, hydrogen, carbon, gold, iron, and helium. An element can be either a solid, a liquid, or a gas. The form that it is in is called its standard state.







Name: \_\_\_\_\_ Section: \_\_\_\_\_

**What's the Difference?**  
Atoms, Molecules, Elements and Compounds

Directions: Complete the section by writing "Atom," "Molecule," "Element," or "Compound" on the line.

1. An atom is the smallest particle of a substance that is made up of one or more atoms.
2. An atom is the smallest particle of any pure element.
3. An atom is a substance that cannot be broken down by simple chemical and physical processes.
4. An atom is the particle known as the building block of matter.
5. An atom is a chemical substance that is made up of two or more different kinds of atoms bonded together.

Directions: Look at each picture below. Each circle represents an atom. If they are touching, they are chemically combined. Each element is represented by a pattern. Write the number of atoms, molecules, elements and compounds for each example on the lines below. The first example has been done for you.

|  |   |   |
|--|---|---|
| <br>1. atom _____<br>molecule _____<br>element _____<br>compound _____ | <br>2. atom _____<br>molecule _____<br>element _____<br>compound _____ | <br>3. atom _____<br>molecule _____<br>element _____<br>compound _____ |
| <br>4. atom _____<br>molecule _____<br>element _____<br>compound _____ | <br>5. atom _____<br>molecule _____<br>element _____<br>compound _____ | <br>6. atom _____<br>molecule _____<br>element _____<br>compound _____ |

When it is in its standard state, it has the same number of electrons as it has protons. Elements are organized according to the structure of their atoms in a chart called the periodic table. They are organized and arranged on this chart in such a way that we can tell a great deal about the composition of structure and nature in a lab situation. The periodic table is so called because the element are grouped in cycles or "periods." From left to right, the table lists them in rows based on their atomic number and rows based on the number of electrons in their outer shells. The tendency of any given atom to form a bond depends on how many electrons it has in its outer shell. All scientists, all over the world, name compounds in the same way, based on how the molecule is constructed. Mixtures can be either homogenous or heterogeneous. When a mixture is homogenous, the substances being combined are distributed evenly throughout the mixture. There are several types of homogenous mixtures. In a solution, one substance (the solute) dissolves completely into another (the solvent). One type of homogenous mixture is called a solution. In a solution, one substance (the solute) dissolves completely into another (the solvent).

Most homogenous mixtures can be separated again, although the process can be complex and involve multiple phases. A suspension is a liquid is mixed with a solid. Instead of dissolving when mixed, the particles remain "suspended" throughout the liquid and can easily be seen with the naked eye. If a suspension is left alone long enough, the solid particles separate from the liquid and settle. A colloid is a type of mixture in which tiny particles of one substance are distributed uniformly throughout another substance. There are several different ways to separate mixtures. The method by which the substances in a mixture are separated is called a process. Distillation is the process of boiling in order to separate the components of liquid solutions. A mixture results when two substances are combined, but not combined chemically.

Because no chemical reaction has occurred, mixtures can be easily separated, the original components retain their individual properties, and the proportion of the component substances can vary. A solution has identifiable characteristics. The substances in a solution are completely uniform (homogenous) throughout. When multiple elements bond together during a chemical reaction, the result is called a compound. Compounds act like a single substance. The number of electrons in an atom's outer shell that are available to participate in the process of chemical bonding are called valence electrons. An element is a substance that is composed entirely of one type of atom. There are 118 known forms of these. A compound is a substance that is formed when multiple kinds of elements are joined together by a chemical bond. Like elements, compounds have both names and symbols. The name of a compound depends on how it is constructed. The name of a compound indicates both what kind of elements comprise it, and how many atoms of each element are present in each molecule of the compound. You've probably encountered the terms elements, compounds, and mixtures several times in chemistry.

But what are they? Elements, compounds, and mixtures are constituents of matter. Matter can either be pure or impure. Elements and compounds are pure forms of matter, while a mixture is impure. I'll discuss elements, compounds, and mixtures in detail in this article. We'll look at their different categories and how they differ from each other. What is an Element? An element is a pure substance that cannot be decomposed by chemical means to form simpler substances. Elements are the fundamental building blocks of matter. They cannot be changed or broken down into any other simpler substances by chemical reactions. An element is composed only of a single type of atom. Carbon, for instance, contains carbon atoms. While some elements occur as single atoms, others exist in groups of two or more and are referred to as molecules. Currently, there are 118 elements on the periodic table. These elements are distinct from each other by the number of protons present in their atoms. Each element has a different number of protons.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Naming Ionic Compounds Worksheet

|                                      |                        |
|--------------------------------------|------------------------|
| Na <sub>2</sub> CO <sub>3</sub>      | sodium carbonate       |
| NaOH                                 | sodium hydroxide       |
| MgBr <sub>2</sub>                    | magnesium bromide      |
| KCl                                  | potassium chloride     |
| FeCl <sub>2</sub>                    | iron (II) chloride     |
| FeCl <sub>3</sub>                    | iron (III) chloride    |
| Zn(OH) <sub>2</sub>                  | zinc hydroxide         |
| Be <sub>2</sub> SO <sub>4</sub>      | beryllium sulfate      |
| CrF <sub>2</sub>                     | chromium (II) fluoride |
| Al <sub>2</sub> S <sub>3</sub>       | aluminium sulfide      |
| PbO                                  | lead (II) oxide        |
| Li <sub>3</sub> PO <sub>4</sub>      | lithium phosphate      |
| TiI <sub>4</sub>                     | titanium (IV) iodide   |
| Co <sub>3</sub> N <sub>2</sub>       | cobalt (II) nitride    |
| Mg <sub>3</sub> P <sub>2</sub>       | magnesium phosphide    |
| Ga(NO <sub>2</sub> ) <sub>3</sub>    | gallium nitrite        |
| Ag <sub>2</sub> SO <sub>3</sub>      | silver sulfite         |
| NH <sub>4</sub> OH                   | ammonium hydroxide     |
| Al(CN) <sub>3</sub>                  | aluminium cyanide      |
| Be(CH <sub>3</sub> COO) <sub>2</sub> | beryllium acetate      |

Elements are categorized into two: Most elements form positive ions during chemical reactions and are referred to as metals. Elements that form negative ions during chemical changes are called non-metals.

Examples include oxygen, bromine, nitrogen, and hydrogen. Other non-metals like iodine and sulfur are solids under room conditions. What is a Compound? A compound is a substance formed when two or more elements combine chemically. When two or more elements participate in a chemical reaction, their atoms exchange electrons, forming chemical bonds.

These bonds hold the atoms of the elements together, forming a compound. The type of compound and chemical bond formed depends on whether the elements involved are metals or non-metals. Compounds are generally classified into two: Ionic compounds Molecular compounds Ionic compounds are formed when a metal and a non-metal chemically combine. For instance, sodium chloride (NaCl) is an ionic compound formed when sodium (metal) combines with chlorine (non-metal). The resulting bond is ionic. Conversely, molecular compounds are formed when two or more non-metals combine. For example, water (H<sub>2</sub>O) is formed when hydrogen chemically combines with oxygen. The resulting bond is covalent. Even though a compound results from two or more elements, its properties are distinct from the individual elements that compose it. Unlike elements, compounds can be chemically decomposed to form simpler substances. What is a Mixture? A mixture is a substance formed when two or more elements or compounds are physically combined. There are no chemical changes in the formation of a mixture. Unlike in a compound, the constituents of a mixture retain their original properties. They can also be easily separated by physical means. Take, for instance, sulfur and iron. When physically combined, sulfur will retain its yellow color in the mixture, and iron, dark grey. You can easily separate these two components with a magnet.

But when the mixture is heated, chemical changes occur. A black solid is formed. The solid is iron sulfide, a compound of sulfur and iron.

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

### Naming Binary Covalent Compounds

#### COVALENT MOLECULAR COMPOUNDS- COMPOSED OF NONMETALS ONLY.

- Name of the "more metallic" element is written first. Since both are nonmetals, choose the element closest to the bottom or left of the periodic table.
- The ending of the second nonmetal is changed to -ide.
- Prefixes are added to indicate the number of atoms present. Mono is not used on the first element just write the name if there is only one.

|         |         |        |         |
|---------|---------|--------|---------|
| 1 MONO  | 2 DI    | 3 TRI  |         |
| 4 TETRA | 5 PENTA | 6 HEXA |         |
| 7 HEPTA | 8 OCTA  | 9 NONA | 10 DECA |

#### EXAMPLES:

CO is carbon monoxide      CO<sub>2</sub> is carbon dioxide  
 SF<sub>6</sub> is sulfur hexafluoride      P<sub>2</sub>O<sub>5</sub> is diphosphorus trioxide

- |   |   |
|---|---|
| 1. CO _____                               | 2. CO <sub>2</sub> _____                |
| 3. H <sub>2</sub> O _____                 | 4. NH <sub>3</sub> _____                |
| 5. CH <sub>4</sub> _____                  | 6. NO _____                             |
| 7. N <sub>2</sub> O _____                 | 8. N <sub>2</sub> O <sub>5</sub> _____  |
| 9. N <sub>2</sub> O <sub>4</sub> _____    | 10. PCl <sub>5</sub> _____              |
| 11. PF <sub>3</sub> _____                 | 12. P <sub>2</sub> O <sub>5</sub> _____ |
| 13. SO <sub>2</sub> _____                 | 14. S <sub>2</sub> O <sub>8</sub> _____ |
| 15. SiCl <sub>4</sub> _____               | 16. B <sub>2</sub> C _____              |
| 17. BN _____                              | 18. CS <sub>2</sub> _____               |
| 19. SeF <sub>6</sub> _____                | 20. H <sub>2</sub> O _____              |
| 21. ClO _____                             | 22. N <sub>2</sub> O _____              |
| 23. NI <sub>2</sub> _____                 | 24. AsCl <sub>3</sub> _____             |
| 25. CCl <sub>4</sub> _____                | 26. SeF <sub>6</sub> _____              |
| 27. SiO <sub>2</sub> _____                | 28. H <sub>2</sub> S _____              |
| 29. SF <sub>6</sub> _____                 | 30. SO <sub>2</sub> _____               |
| 31. XeF <sub>4</sub> _____                | 32. TeF <sub>6</sub> _____              |
| 33. BBr <sub>3</sub> _____                | 34. XeF <sub>4</sub> _____              |
| 35. Se <sub>2</sub> Cl <sub>2</sub> _____ | 36. N <sub>2</sub> _____                |
| 37. ClF <sub>3</sub> _____                | 38. BrF <sub>3</sub> _____              |
| 39. SCl <sub>2</sub> _____                | 40. S <sub>2</sub> F <sub>8</sub> _____ |

Iron sulfide differs from its constituent elements in chemical and physical properties. A mixture can either be heterogeneous or homogeneous. The constituents of a heterogeneous mixture are not uniformly distributed throughout the bulk. A good example is a mixture between water and oil that form two distinct layers with interphase. A homogeneous mixture, on the other hand, has its components uniformly distributed throughout the bulk. Water and ethanol, for instance, form a uniform composition with no distinct layers. In Summary Atoms are the simplest form of matter. Atoms have a dense center called the nucleus. In this nucleus you will find two types of sub-atomic particles: positively charged protons and non-charged neutrons. These particles account for the weight (mass) of the atom.

**NAME \_\_\_\_\_**

## Elements, Compounds and Mixtures 2

Each picture below is one of the following:

- ▶ ELEMENT (E)
- ▶ COMPOUND (C)
- ▶ MIXTURE OF ELEMENTS (ME)
- ▶ MIXTURE OF COMPOUNDS (MC)
- ▶ MIXTURE OF ELEMENTS and COMPOUNDS (MEC)

Directions: Correctly label each picture for what it is representing. Remember, each shape symbolizes an **element**. If two different elements are connected, then that object symbolizes a **compound**.

Flying around the nucleus, like planets orbiting the sun, are negatively charged sub-atomic particles called electrons. An element is an atom that composed completely of one type of atom. Each element of atom differs by the number of protons it contains. When two or more elements bond together it changes each element's chemical properties this called a compound. When you have a groups of elements and/or compounds that interact, but do not bond and are still separate by physical means, you have a mixture. Elements are the primary components of matter. When combined chemically, they form compounds. When combined physically, they form mixtures. The properties of compounds and mixtures differ in various ways. Little chemists can learn more about the elements in the periodic table with this helpful worksheet about molecules and compounds. Learn the difference between these two similar particle types, and then do a little research to find some examples of each. See in a set (9)View answer keyAdd to collectionAssign digitallyCommon Core State StandardsTexas Essential Knowledge and Skills (TEKS)Virginia Standards of Learning (SOL)Next Generation Science Standards (NGSS)BC Performance StandardsAlberta Program of StudiesThe Australian Curriculum (ACARA)The Victorian Curriculum (F-10)