

Fifth Grade “Chemistry: Matter and Change” Assessment

1a. What is the small, dense center of the atom with a positive charge called?

atom electron neutron nucleus proton

1b. What is the nucleus?

1c. Explain why the nucleus is positively charged.

2a. What is the elementary particle with a positive charge called?

atom electron neutron nucleus proton

2b. What is a proton?

2c. Compare a proton to a neutron:

3a. What is the elementary particle without an electrical charge called?

atom electron neutron nucleus proton

3b. Describe a neutron:

3c. Which is bigger an atom or a neutron? Explain your answer.

4a. What is the elementary particle with a negative charge and a very small mass called?

atom electron neutron nucleus proton

4b. What is the elementary particle with a negative charge and a very small mass called?

4c. Explain what an electron is and where they can be found.

5a. What smallest unit of matter is constantly in motion?

molecule element compound atom

5b. What smallest unit of matter is constantly in motion?

5c. Explain what an atom is, its parts, and what it forms when it links with another atom.

6a. What is a combination of two or more atoms held together by a force between them called?

molecule element compound atom

6b. Describe a molecule.

6c. Which is larger a molecule or an atom? Explain why.

7a. What is a substance containing two of more elements in definite proportions called?

molecule element compound atom

7b. What is a substance containing two of more elements in definite proportions called?

7c. How are a compound and a molecule similar?

8a. What is any material that cannot be broken down into more fundamental substances called?

molecule element compound atom

8b. What is element?

8c. Explain the relationship between elements and compounds.

9a. What is the formula for water?

9b. What are the formulas for water and carbon dioxide?

9c. What are the formulas for water, carbon dioxide, and salt?

10a. How many different elements are there?

119 1000 215 302

10b. How many different elements are there?

10c. How many different elements are there and what is the breakdown between those in nature and those produced in laboratories?

11a. What organizes the elements with common properties?

11b. What is the periodic table of elements?

11c. Explain the periodic table of elements with reference to atomic number, groups, periods, and atomic symbol.

12a. Circle the following symbols for each element listed.

1. Hydrogen	Hy	He	H
2. Helium	Hy	He	H
3. Carbon	C	Cl	Cu
4. Copper	C	Cl	Cu
5. Chlorine	C	Cl	Cu
6. Nitrogen	Ni	N	Na
7. Sodium	S	Na	So
8. Oxygen	O	Ox	Oy
9. Aluminum	Am	Au	Al
10. Silicon	Si	S	Sl
11. Iron	I	Fe	Fi
12. Silver	Si	Au	Ag
13. Gold	G	Au	Ag

12b. Give the following symbols for each element listed.

1. Hydrogen	_____
2. Helium	_____
3. Carbon	_____
4. Copper	_____
5. Chlorine	_____
6. Nitrogen	_____
7. Sodium	_____
8. Oxygen	_____
9. Aluminum	_____
10. Silicon	_____
11. Iron	_____
12. Silver	_____
13. Gold	_____

12c. Give the following symbols for each element listed and then circle which characteristic best describes the element.

1. Hydrogen	_____	Metal	Nonmetal	Gas
2. Helium	_____	Metal	Nonmetal	Gas
3. Carbon	_____	Metal	Nonmetal	Gas
4. Copper	_____	Metal	Nonmetal	Gas
5. Chlorine	_____	Metal	Nonmetal	Gas
6. Nitrogen	_____	Metal	Nonmetal	Gas
7. Sodium	_____	Metal	Nonmetal	Gas
8. Oxygen	_____	Metal	Nonmetal	Gas
9. Aluminum	_____	Metal	Nonmetal	Gas
10. Silicon	_____	Metal	Nonmetal	Gas
11. Iron	_____	Metal	Nonmetal	Gas
12. Silver	_____	Metal	Nonmetal	Gas
13. Gold	_____	Metal	Nonmetal	Gas

13a. Elements have two important categories: metals and _____.

13b. What are the two categories for elements?

1. _____
2. _____

13c. Identify the properties of metals.

14a. What is a molecule that is made up of and results in a new substance with a new molecular structure called?

physical change chemical change

14b. What is a molecule that is made up of and results in a new substance with a new molecular structure called?

14c. Explain a chemical change and give an example.

15a. What is a molecule that changes only the properties or appearance of the substance, but does not change what the substance is made up of called?

physical change chemical change

15b. What is a molecule that changes only the properties or appearance of the substance, but does not change what the substance is made up of called?

15c. Explain a physical change and give an example.

The following Colorado Model Content Standards are covered in this assessment by the questions indicated:

Questions 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c, 8a, 8b, 8c, 9a, 9b, 9c, 10a, 10b, 10c, 11a, 11b, 11c, 12a, 12b, 12c, 13a, 13b, 13c: Standard 5-8.2.1.c classifying and describing matter in terms of elements, compounds, mixtures, atoms, and molecules

Questions 14a, 14b, 14c, 15a, 15b, 15c: Standard 5-8.2.3.b identifying and predicting what will change and what will remain unchanged when matter experiences an external force of energy change

Answer Key

- 1a. nucleus
- 1b. Acceptable answers could include:
-the small dense center of the atom
-The nucleus is composed of protons and neutrons and has a positive electrical charge.
- 1c. Acceptable answers could include:
-The nucleus is made up of both neutrons and protons. Since neutrons have no charge and protons have a positive charge, the nucleus ends up with a positive charge.
- 2a. proton
- 2b. Acceptable answers could include:
-an elementary particle with a positive charge, found in the nucleus of an atom
-A proton is over a thousand times heavier than an electron.
- 2c. Acceptable answers could include:
-Protons and neutrons are both elementary particles found within the nucleus. Together they make up most of the atoms mass, because they are about equal in mass. The only difference between a proton and neutron is that the neutron has no charge and a proton is positively charged.
- 3a. neutron
- 3b. Acceptable answers could include:
-an elementary particle without an electrical charge; one of the building blocks of the nucleus of the atom, a neutron has about the same mass as a proton
- 3c. Acceptable answers could include:
-an atom is bigger than a neutron because a neutron is contained within the nucleus of an atom
- 4a. electron
- 4b. electron
- 4c. Acceptable answers could include:
-an elementary particle with a negative charge and a very small mass.
-Electrons are normally found in orbits around the nucleus of an atom. The chemical reaction that an atom undergoes depends primarily on the electrons in the outermost orbits.
- 5a. atom
- 5b. atom
- 5c. Acceptable answers could include:
-A unit of matter; the smallest unit of a chemical element. Each atom consists of a nucleus, which has a positive charge, and a set of electrons that move around the nucleus. They link together to form molecules.
- 6a. molecule
- 6b. Acceptable answers could include:
-a combination of two or more atoms held together by a force between them

- 6c. Acceptable answers could include:
-A molecule is larger than an atom because a molecule consists of two or more atoms that have linked together.
- 7a. compound
7b. compound
7c. Acceptable answers could include:
-A molecule and a compound are similar because they both consist of two or more atoms of elements joining together to create them.
- 8a. element
8b. Acceptable answers could include:
-any material that cannot be broken down into more fundamental substances
8c. Acceptable answers could include:
-The relationship between a compound and an element is that a substance containing two or more elements in definite proportions is considered a compound. This means that elements join together to form compounds.
- 9a. H₂O
9b. H₂O, CO₂
9c. H₂O, CO₂, and NaCl
- 10a. 119
10b. 119
10c. Acceptable answers could include:
-there are 119 chemical elements whose discovery has been claimed; 92 occur in nature and 27 have been produced in laboratories
- 11a. periodic table of elements
11b. Acceptable answers could include:
-a chart of the chemical elements that displays them in rows horizontally in order of increasing atomic number and vertically according to similarity of the chemical properties of their atoms
11c. Acceptable answers could include:
-A periodic table is chart of the chemical elements that displays them in rows horizontally called periods in order of increasing atomic number and vertically called groups according to similarity of the chemical properties of their atoms. In the center of each square is the atomic symbol form the element. This is a one or two letter abbreviation for the elements.
- 12a. H
He
C
Cu
Cl
N

12b. Na
O
Al
Si
Fe
Ag
Au
H
He
C
Cu
Cl
N
Na

O
Al
Si
Fe
Ag
Au

12c. H gas
He gas
C nonmetal
Cu metal
Cl gas
N gas
Na metal
O gas
Al metal
Si nonmetal
Fe metal
Ag metal
Au metal

13a. nonmetals

13b. metals and nonmetals

13c. Acceptable answers could include:

-metals comprise about 2/3 of the elements having the following properties: most are shiny, ductile, malleable, and conductive

14a. chemical change

14b. chemical change

14c. Acceptable answers could include:

-a molecule that is made up of and results in a new substance with a new molecular structure

-Examples: rusting of iron, burning of wood, milk turning sour

15a. physical change

15b. physical change

15c. Acceptable answers could include:

-a molecule that changes only the properties or appearance of the substance, but does not change what the substance is made up of

-Examples include cutting wood or paper, breaking glass, freezing water.