Fourth Grade "Chemistry: Basic Terms and Concepts" Assessment

1a. What is the smallest complete part of any kind of matter?
- a. atoms
- b. molecules

1b. A(n) _____ is the smallest complete part of any kind of matter.
- a. atom
- b. charge
- c. molecule
- d. element

1c. A(n) _____ is the smallest complete part of any kind of matter.

2a. Protons have a _____ charge.
- a. positive
- b. negative

2b. Protons have a _____ charge.
- a. positive
- b. negative
- c. neutral
- d. strong

2c. Protons have a _____ charge.

3a. Electrons have a _____ charge.
- a. positive
- b. negative

3b. Electrons have a _____ charge.
- a. positive
- b. negative
- c. neutral
- d. strong

3c. Electrons have a _____ charge.

4a. Neutrons have a _____ charge.
- a. neutral
- b. positive

4b. Neutrons have a _____ charge.
   a. positive
   b. negative
   c. neutral
   d. strong

4c. Neutrons have a _____ charge.

5a. Which of the following is true?
   a. Atoms may contain particles with protons, electrons, and neutrons.
   b. Atoms may contain particles with metal, water, and electricity.

5b. List the three types of particles that are found in an atom.
   1. _____
   2. _____
   3. _____

5c. List the three types of particles that are found in an atom and circle the two particles which can be found in the nucleus.
   1. _____
   2. _____
   3. _____

6a. Two protons will _____ each other
   a. attract
   b. repel

6b. Which of the following is true?
   a. Particles with the same charges will repel each other.
   b. Particles with the same charges will attract each other.

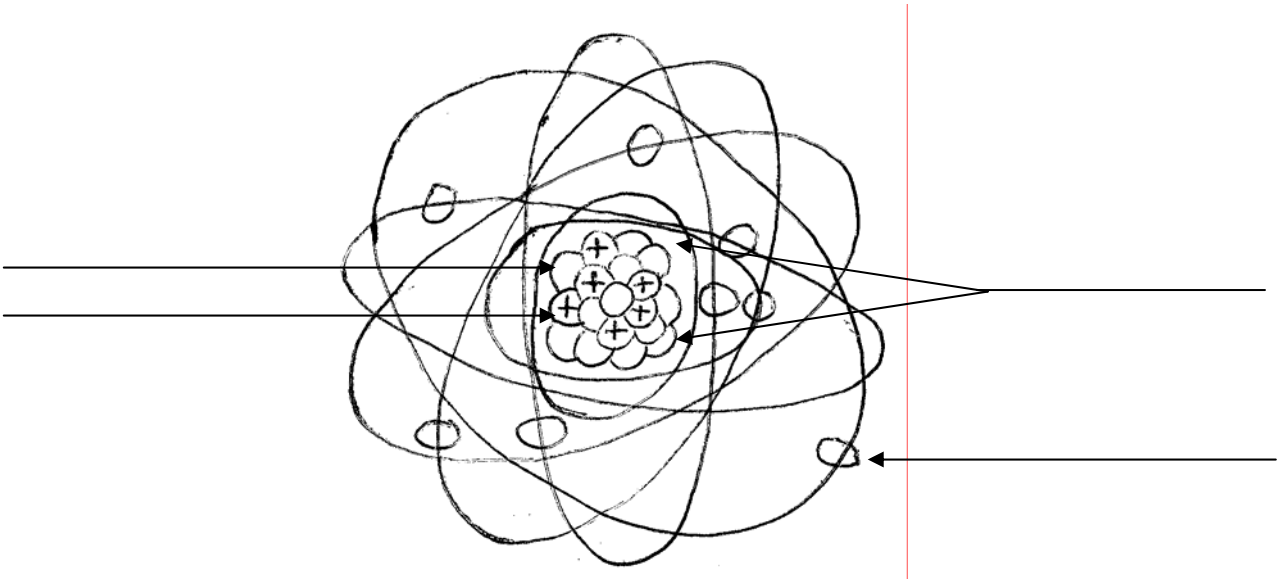
6c. Particles with the same charges will _____ each other.

7a. Two electrons will _____ each other
   a. attract
   b. repel

7b. Which of the following is true?
   a. Particles with different charges will repel each other.
   b. Particles with different charges will attract each other.

7c. Particles with different charges will be _____ to each other.

8a. Label the atom using the terms: nucleus, proton, neutron, and electron.



8b. Draw a simple atom labeling the nucleus, protons, neutrons, and electrons

8c. Draw each of three different models that scientist have used to represent atoms.

Rutherford Model Bohr Model Electron Cloud Model

9a. _____ is the measure of how heavy something is.

a. Weight
b. Mass

9b. The measure of the pull of gravity is called:

a. weight
b. mass
c. density
d. element

9c. As you get farther away from Earth would your weight increase or decrease? Explain your answer.

_____
_____
_____
_____
_____
_____

10a. The amount of matter found in an object is called _____.

a. weight
b. mass

10b. A material that takes up more space than another has more _____.

a. gravity
b. volume
c. weight
d. mass

10c. Tell why gravity affects weight but not mass:

_____
_____
_____
_____
_____

11a. The amount of space that *anything* takes up is called its _____.

a. gravity
b. volume

11b. The amount of space that *anything* takes up is called its _____.

a. gravity
b. volume
c. weight
d. mass

11c. The amount of space that *anything* takes up is called its _____.

12a. The term _____ is used to describe the way matter is packed together.
a. density
b. volume

12b. The amount of matter packed into a given space is called _____.
a. gravity
b. volume
c. weight
d. density

12c. Volume is _____.

13a. A _____ is a space with no matter in it.
a. hole
b. vacuum

13b. A(n) _____ is a space with no matter in it.

13c. Tell how you could create a vacuum in a container:
_____
_____
_____
_____
_____

14a. Elements are the basic kinds of _____.
a. matter
b. space

14b. Elements are the basic kinds of _____.
a. matter
b. space
c. neutrons
d. protons

14c. How many basic elements exist and what are they made of?
_____
_____
_____
_____

15a. Elements are labeled according to the number of _____ they contain.
a. electrons/protons
b. space/matter

15b. Elements are labeled according to the number of _____ they contain.
   a. electrons/protons
   b. space/matter
   c. electrons/neutrons
   d. neutrons/protons

15c. Describe what elements contain and how they are labeled.

_____
_____
_____
_____

16a. How many elements are there on the periodic table?
   a. 10
   b. 432
   c. 119
   d. 52

16b. How many elements occur naturally in nature?
   a. 10
   b. 432
   c. 92
   d. 52

16c. What is the periodic table?

_____
_____
_____
_____
_____

17a. Can elements be broken down into simpler substances?

_____

17b. Is water (H_2O) an element? Explain.

_____
_____
_____
_____

17c. If you were to split a gold atom apart, would you still call the parts of the atom gold?

_____
_____
_____
_____
_____

18a. What is the symbol for the element gold?

a. Si
b. Go
c. Au
d. Cu

18b. List the periodic symbol next to each element below.

Gold _____
Copper _____
Aluminum _____
Oxygen _____
Iron _____

18c. List 10 elements and their symbols off the periodic table.

1. _____ _____
2. _____ _____
3. _____ _____
4. _____ _____
5. _____ _____
6. _____ _____
7. _____ _____
8. _____ _____
9. _____ _____
10. _____ _____

19a. The combination of an oxygen element and two hydrogen elements would create:

a. mud
b. carbon dioxide
c. wood
d. water

19b. Name the substances that are made up of the combinations of elements.

Two Hydrogen & Oxygen = _____
Sodium & Chlorine = _____
Carbon & Two Oxygen = _____

19c. List three pairs of elements that will combine to make other substances.

_____ & _____ = _____
_____ & _____ = _____
_____ & _____ = _____

20a. In chemistry, any substance that cannot changed into a simpler substance is called a(n)?

a. molecule
b. element
c. compound
d. neutron

20b. Elements are _____.
a. many different chemicals combined together by atoms
b. substances that cannot changed into a simpler substance

20c. Can elements be changed? Explain why or why not. Give an example.
_____
_____
_____
_____
_____

21a. What is a mixture called where the different parts mix together evenly?
a. chemicals
b. solution

21b. A uniform mixture of one solid, liquid, or gas with another solid, liquid, or gas is called a(n) _____.
a. mixture
b. mud
c. solution
d. element

21c. What is a solution?
_____
_____
_____
_____
_____

22a. Can you always see the solute in a solution?
_____

22b. What is the substance in a solution called that is of the lesser quantity?
_____

22c. Can you always see the solute in a solution? Explain.
_____
_____
_____
_____
_____

23a. What is the substance with the larger quantity in a solution called?
a. solute
b. solvent

23b. In a solution of water and sugar, which substance is the solvent?

_____

23c. Why is water called the universal solvent?

_____
_____
_____
_____
_____

24a. When a solution contains a large amount of solute it is called a _____ solution.

a. dilute
b. concentrated

24b. When a solution contains a large amount of solute it is called a _____ solution.

24c. Explain the difference between a concentrated solution and a dilute solution.

_____
_____
_____
_____
_____

25a. When a solvent can hold no more solute, the mixture is called a _____ solution.

a. saturated
b. concentrated

25b. When a solvent can hold no more solute, the mixture is called a _____ solution.

25c. What is a saturated solution?

_____
_____
_____
_____
_____

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

Question 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 6a, 6b, 6c, 7a, 7b, 7c: Standard 2.1.a.K-4-examining, describing, classifying, and comparing tangible objects in terms of common physical properties *(for example, state of matter, size, shape, texture, flexibility, color)*;

Question 5c: Standard 3.3.a.5-8-describing the observable components and functions of a cell *(for example, cell membrane, nucleus, cytoplasm, chloroplasts; movement of molecules into and out of cells)*

Question 9a, 9b, 9c, 10a, 10b, 10c, 11a, 11b, 11c, 12a, 12b, 12c, 13a, 13b, 13c: Standard 2.1.b.K-4; measuring common physical properties of objects *(for example, length, mass, volume, temperature)*

Answer Key

1a. a. atoms
1b. a. atom
1c. atom

2a. a. positive
2b. a. positive
2c. positive

3a. b. negative
3b. b. negative
3c. negative

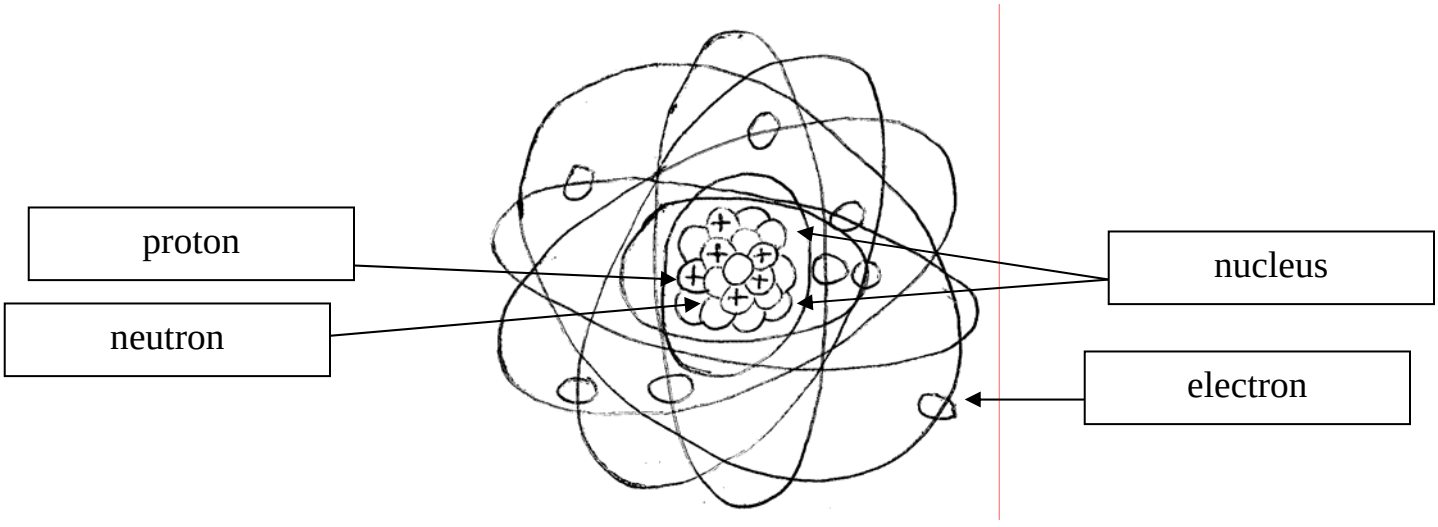
4a. a. neutral
4b. c. neutral
4c. neutral or no

5a. a. Atoms may contain particles with protons, electrons, and neutrons.
5b. protons, electrons, neutrons
5c. protons, electrons, neutrons; circled items should be protons and neutrons

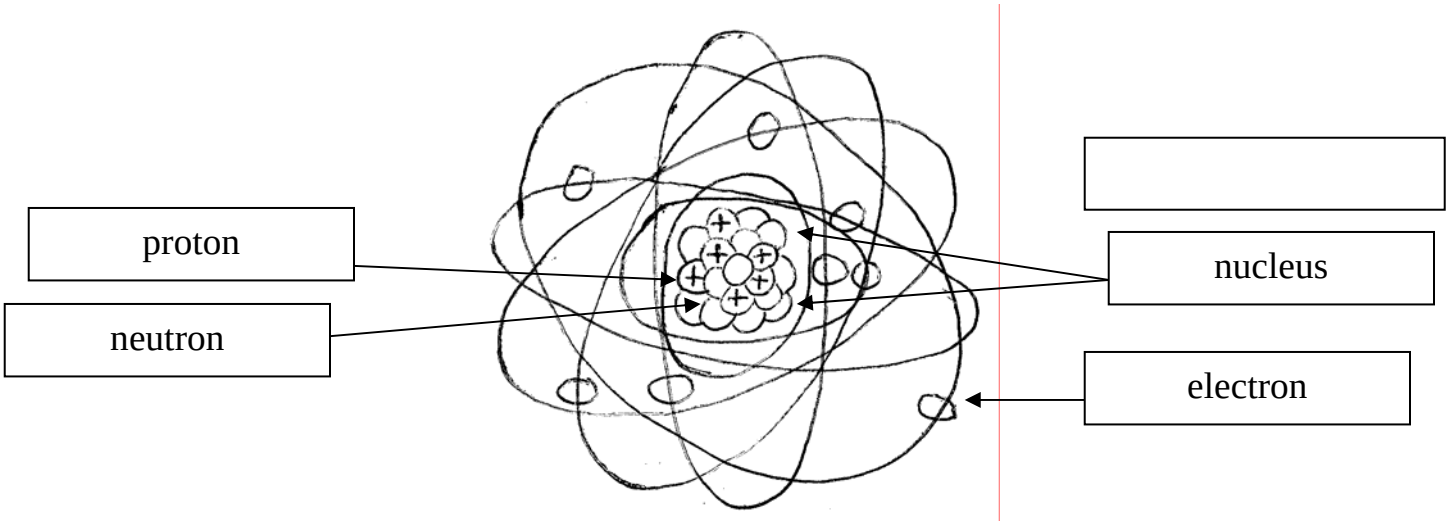
6a. b. repel
6b. a. Particles with the same charges will repel each other.
6c. repel

7a. b. repel
7b. b. Particles with different charges will attract each other.
7c. attracted

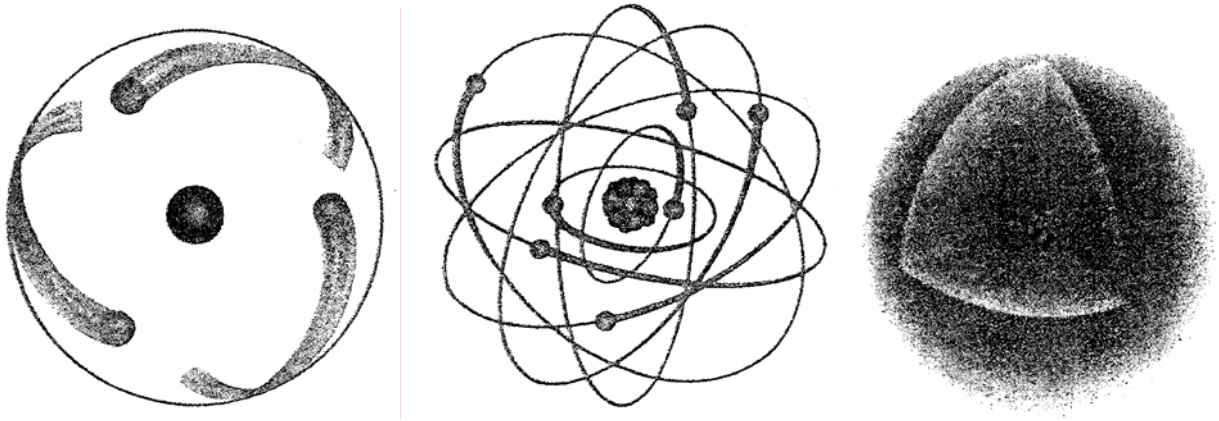
8a.



8b.



8c.



Rutherford model **Bohr model** **Electron Cloud model**

9a. a. Weight
9b. a. weight
9c. Acceptable answers could include:
-Weight would decrease because the force of gravity on an object varies with distance from the source. Therefore, the pull of gravity will decrease as you move away from Earth.

10a. b. mass
10b. d. mass

10c. Acceptable answers could include:
-Weight is the measure of the pull of gravity. As gravity changes, so will weight.
-Mass, however, is the amount of matter in something. Gravity does not change the amount of mass.

11a. b. volume
11b. b. volume
11c. volume

12a. a. density
12b. d. density
12c. Acceptable answers could include:
-the amount of space a thing fills

13a. b. vacuum
13b. vacuum
13c. Acceptable answers could include:
-make sure the container is air tight
-pump all the air out of the container
-remove everything from an airtight container

14a. a. matter
14b. a. matter
14c. Acceptable answers could include:
-There are a little more than one hundred basic elements. They are made up of atoms and are labeled according to the number of electrons they contain, which is also the same number of protons they contain.

15a. a. electrons/protons
15b. a. electrons/protons
15c. Acceptable answers could include:
-Elements contain protons, neutrons and electrons and are labeled according to the number of electrons and protons they contain. There is always the same number of protons as there are electrons in an element.

16a. c. 119
16b. c. 92
16c. Acceptable answers could include:
-A chart of the chemical elements
-Elements are listed in order of increasing atomic number
-Elements are grouped into columns with other elements with similar properties

17a. No

17b. Acceptable answers could include:
-No
-Water is made up of the combination of two different elements
-It can be broken down into two simpler elements (Hydrogen & oxygen)
-An element cannot be broken down into simpler substances

17c. No, because the atom is the smallest particle of an elements that is still that element.

18a. c. Au

18b. Au
Cu
Al
O
Fe

18c. Any 10 of the 109 possible elements will be acceptable.

19a. d. water

19b.

Two Hydrogen	&	Oxygen	=	Water
Sodium	&	Chlorine	=	Salt
Carbon	&	Two Oxygen	=	Carbon Dioxide

19c.

sodium	&	chlorine	=	salt
hydrogen	&	oxygen	=	water
iron	&	oxygen	=	rust

20a. b. element

20b. b. substances that cannot changed into a simpler substance

20c. Yes. Acceptable answers could include:
-Elements can break down to become other elements.
-This can happen through processes such as radioactive decay.
-An example could include the decay of uranium to become lead.

21a. b. solution

21b. c. solution

21c. Acceptable answers could include:
-A mixture of one solid, liquid, or gas with another solid, liquid, or gas.
-A mixture where the particles in the mixture spread evenly throughout.
-Contains both a solvent and a solute
-The solvent is the substance of greater quantity in a solution
-The solute is the substance of the lesser quantity in a solution

22a. No

22b. Solute

22c. Acceptable answers could include:
-No, often the solute will dissolve in a solution and not be seen.
-No, dissolved substances will not settle out of a solution.

23a. b. solvent

23b. Water
23c. Acceptable answers could include:
-Water is called the universal solvent because it can dissolve more substances than any other solvent.

24a. b. concentrated
24b. concentrated
24c. Acceptable answers could include:
-a concentrated contains a large amount of solute
-a dilute solution contains a small amount of solute
-more solute could easily be mixed into a dilute solution than a concentrated one

25a. a. saturated
25b. saturated
25c. Acceptable answers could include:
- A solution where the solvent holds the most solute possible