PICKENS COUNTY SCHOOLS

Standards-Based Assignment Packet

Subject/Grade: <u>Chemistry</u>

CHEMISTRY

Assignment # 1

Directions:

- In the following blank space on this page, list at least **10** things about chemistry that you already know. If at first you can't think of any, just think a little bit harder! The things that you know don't have to be very elaborate or in depth. Also, our every day experiences can be great places to find chemistry in action...

Assignment # 2

- Sometimes learning a new subject is like learning a new language. Chemistry can be very similar. Although we may be able to pronounce a word, and even know it's part of speech, if we don't know the meaning of the word, then we won't be able to understand the topic at hand. So, in the following assignment, you will practice matching up some basic chemistry vocabulary words with their definitions in the form of a crossword puzzle. Good luck!

State of Matter – Chemistry

Crossword puzzle grid with numbered cells 1-20. No clues or filled letters visible.
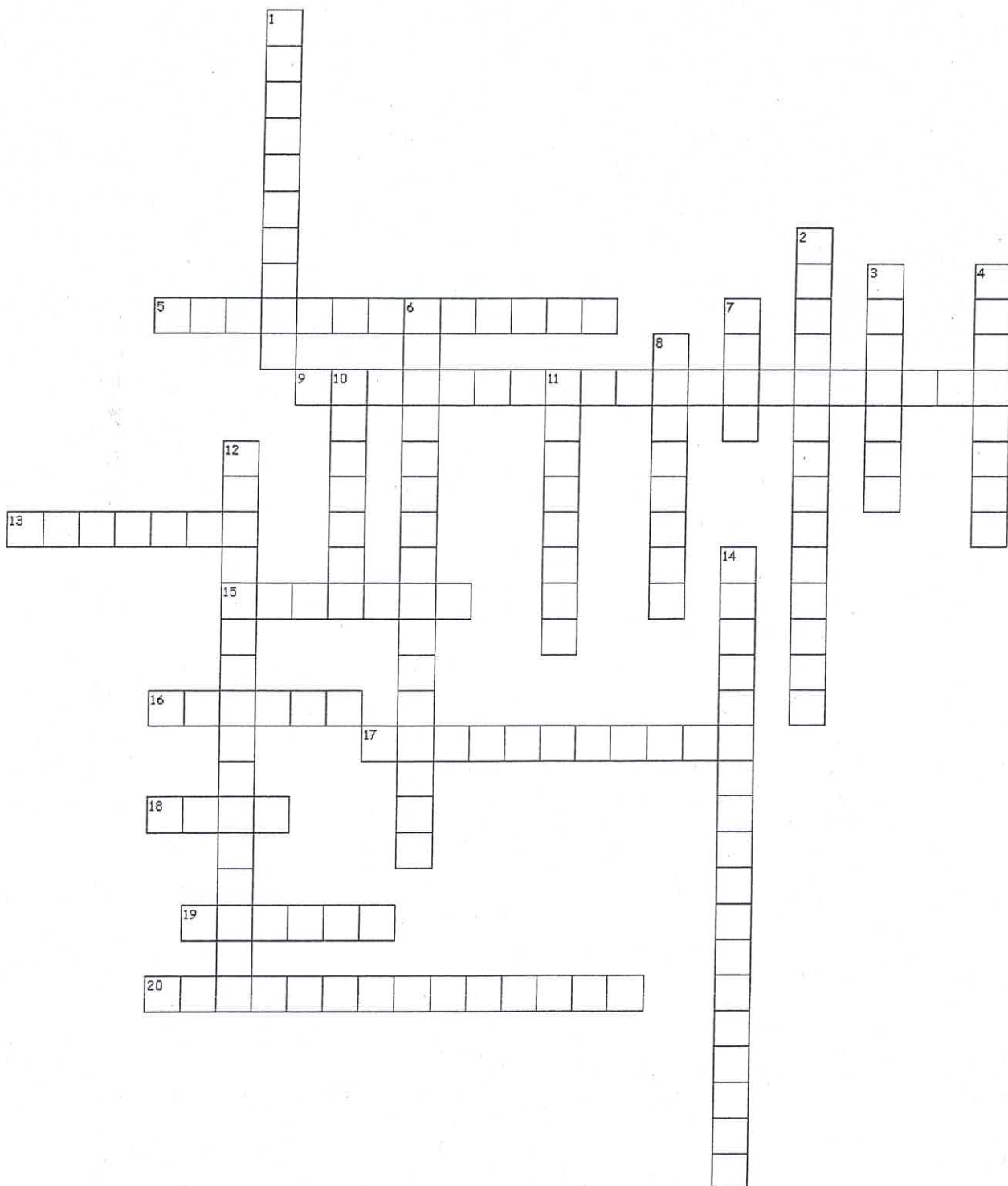
State of Matter – Chemistry

Word Bank:

Isotope, Molecule, Compound, Element, Periodic Table, Neutron, Proton, Electron, Atom, Homogeneous Mixture, Heterogeneous Mixture, Physical Property, Physical Change, Chemical Property, Chemical Change, Kelvin, Density, Temperature, Scientific Method, Mass
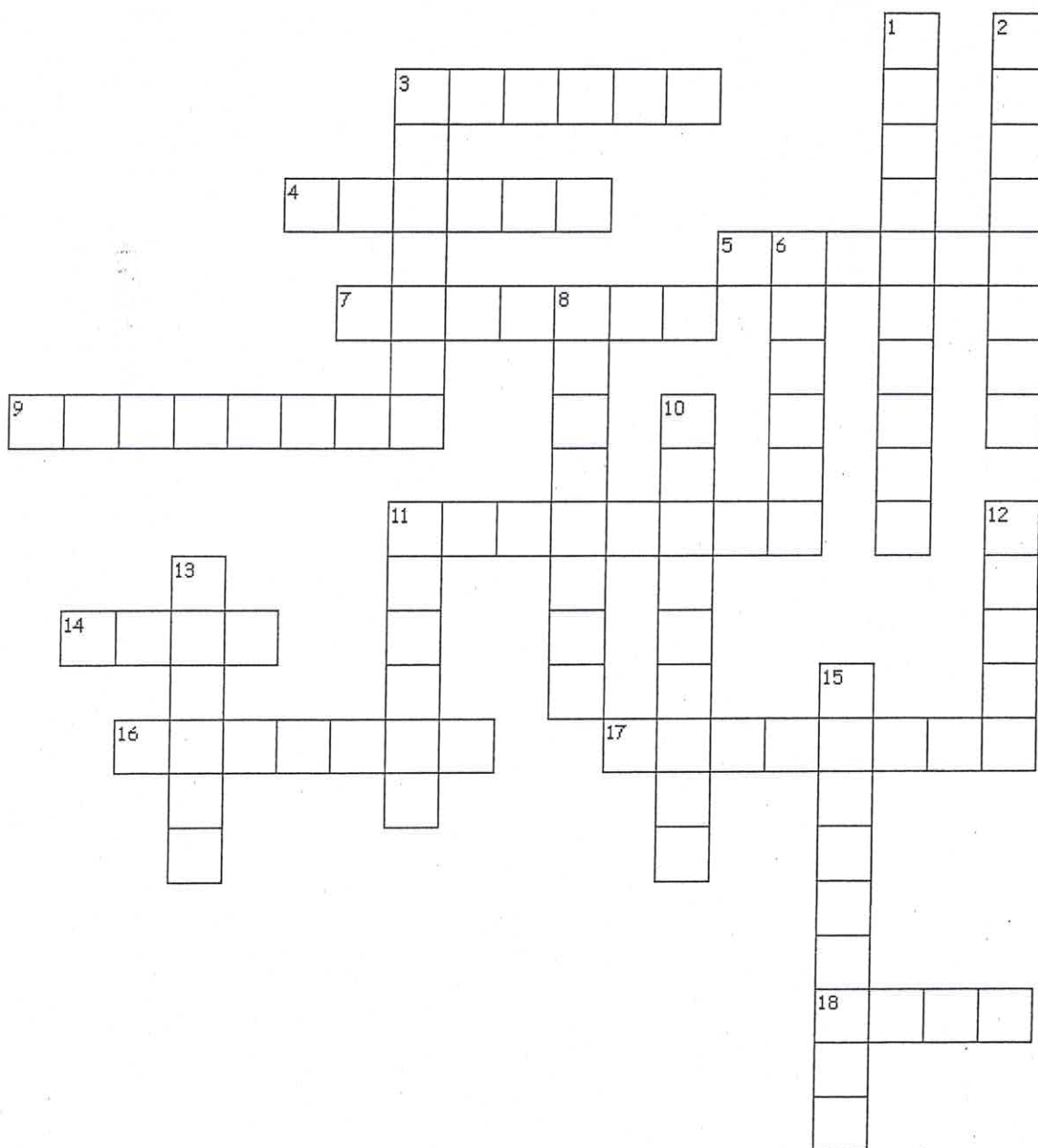
Across
5. Organized list of known elements, Arranged by increasing atomic number
9. Different material unevenly mixed and easily identifiable
13. Mass per unit volume of a material
15. Atoms of the same element that have different number of Neutrons
16. The SI unit of Temperature
17. Average Kinetic Energy of all particles in an object
18. The smallest particle of an element that still retains the properties of that element
19. Positively charged particle inside the nucleus of the atom
20. Change in shape, size or state
Down
1. 6 step method to investigate a problem
2. Change of one substance into a new substance
3. Neutral particle inside the nucleus of the atom
4. A neutral particle that forms as a result of sharing electrons
6. Characteristic of a substance that indicates whether it can undergo a chemical change
7. Amount of matter in an object
8. Substance formed from two or more elements in which the exact proportions are always the same
10. Substance with atoms that are all alike
11. Particles surrounding center of an atom with a negative charge
12. Characteristic of a substance that can be observed without changing identity
14. Solid, liquid or gas that contains two or more substances blended evenly

Elements in the Periodic Table

Use a periodic table to complete the following crossword

Across

3. two forms: diamond, graphite
4. Element Number 16
5. The symbol Cu
7. The symbol Si
9. Soda Cans Made from this
11. The lightest known gas
14. Gas used in colored lights
16. Metal used in some Batteries
17. 78% of the air we breathe
18. The symbol Fe

Down

1. Element Number 15
2. In toothpaste protects teeth
3. The metal found in milk
6. 21% of the air we breathe
8. Kills bacteria in swimming pools
10. Element Number 12
11. Gas in Goodyear Blimps, Balloons
12. Element Number 18
13. The symbol Na
15. The Symbol K

Unit # 2: The Mathematics of Chemistry

Assignment # 1:

- This first assignment will test your ability to do basic calculations, and also to carry units into your answer. For instance, when we are calculating density, we divide the mass (in grams) by the volume (in milliliters). Our answer, therefore, has units of g/mL. Do your best. You can use a calculator if you wish…

Complete the following calculations. Include units on your answers.

1. $\dfrac{(54\ g)}{(4\ L)}$

2. (34 cm) (21 cm) (8 cm)

3. $\dfrac{(12\ kg)\ (30\ m)}{(10\ s)}$

4. $\dfrac{(4.08\ g)}{(0.061\ g)}$

5. $\dfrac{(7.5\ N)\ (0.25\ m)}{(0.68\ s)}$

10. $\dfrac{(75\ kg)\ (5.0\ m)}{(2.5\ s)\ (6.0\ s)}$

11. 56 N x 2.5 m

12. $\dfrac{12700\ J}{(116\ g)\ (4.8^{\circ}C)}$

13. $\dfrac{26000\ J}{125\ g}$

14. $\dfrac{1.35\ mol}{3.55\ L}$

Assignment # 2:

In this second assignment, we are asking you to solve for a variable, x. Many times in chemistry we use an equation to find an unknown quantity while using quantities that we do know. The key is to remember to isolate x by doing the same mathematical operation to both sides. It is ok to have letters in your answer...

Solve each of the following expressions for x. (x = ?)

18. $2x - 15 = 8$

22. $4x = 3 + 8$

23. $8x + 5y - z = 0$

24. $H = WQx$

25. $Y = \dfrac{(T + 6)}{x}$

26. $x + 8 = 23FG$

27. $\underline{18KRx} = E$

     F^2

Unit 3: Some challenging problems...

    In this last unit we are asking you to try a few more difficult problems. They include working with scientific notation, balancing chemical equations, and calculating density.

Express in standard form.   ***Express in scientific notation.***

1. 5.2×10^3 4. 780000

2. 9.65×10^{-4} 5. 0.00000422

3. 8.5×10^{-2} 6. 10000000

Use the exponent function on your calculator to compute the following.

1. $(4.1 \times 10^{23})(8.0 \times 10^3)$ 5. $(3.2 \times 10^4) / (6.8 \times 10^3)$

2. $(3.6 \times 10^4)(13)$ 6. $(4.6 \times 10^3) / (9.8)$
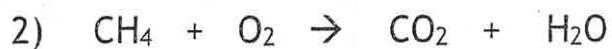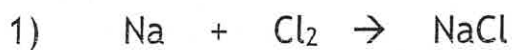
3.. $(4.0 \times 10^{-3})(145)$ 7. $(298) / (2.7 \times 10^{-2})$

4. $(7.9 \times 10^5)(3.1 \times 10^{-8})$ 8. $(5.6 \times 10^{-9}) / (3.3 \times 10^6)$

Balance the following chemical equations:

1) Na + Cl_2 → $NaCl$

2) CH_4 + O_2 → CO_2 + H_2O

3) C_2H_2 + O_2 → CO_2 + H_2O

4) $MgSO_4$ + $Al\ PO_4$ → $Mg_3(PO_4)_2$ + $Al_2(SO_4)_3$

Density Calculations:

1. Calculate the density of an object with a mass of 25.0 g and a volume of 4.55 cm³.