

# POTIONS AND POISONS

Science Olympiad 2018 Division B  
Kraemer Middle School Scrimmage

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

School: \_\_\_\_\_

To be filled out by proctor only:

Score: \_\_\_\_\_

Place: \_\_\_\_\_

Instructions: Read directions carefully. The point value of each question will be indicated at the end of each question. A correct answer will give you + however many points the question is worth. A question left blank will give you +0 points. There is a point penalty for incorrect answers or partially correct answers. Every incorrect answer will earn you -1 points, so guess carefully. For example:

3 correct answers (each question is worth 2 points) = 6 points

7 answers left blank = 0 points

1 incorrect answer = -1 points

TOTAL:  $6 + 0 - 1 = 5$

Also since this is a new event I have no idea how to write this test. Good Luck!!!

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1. A substance in which the constituents are combined in fixed ratios would be considered:
  - a. A solution
  - b. A mixture
  - c. A compound
  - d. A homogeneous mixture
  - e. A heterogeneous mixture
  - f. Both D and E
  - g. Both A and D
  - h. A, E, and D
  
2. Salt water would be considered
  - a. A solution
  - b. A mixture
  - c. A compound
  - d. A homogeneous mixture
  - e. A heterogeneous mixture
  - f. Both D and E
  - g. Both A and D
  - h. A, E, and D

3. Lemonade would be considered
  - a. A solution
  - b. A mixture
  - c. Compound
  - d. A homogeneous mixture
  - e. A heterogeneous mixture
  - f. Both E and D
  - g. A and D
  - h. A, E, and D
  
4. Give an example of a heterogeneous mixture.
  
5. Give an example of a homogeneous mixture.
  
6. Select all that apply:  $O_2$  is considered a(n)
  - a. Atom
  - b. Diatomic element
  - c. Monatomic element
  - d. Molecule
  - e. Compound
  
7. What is the difference between a compound and a molecule?
  
  
8. Removing salt from salt water would be considered a
  - a. Physical Change
  - b. Chemical Change
  
9. Breaking a compound would be considered a
  - a. Physical Change
  - b. Chemical Change
  
10. Breaking a bond between carbon and hydrogen in  $CH_4$  would be considered a
  - a. Physical Change
  - b. Chemical Change
  
11. Rotting wood would be considered a
  - a. Physical Change
  - b. Chemical Change
  
12. Dry ice subliming into carbon dioxide gas would be considered a
  - a. Physical Change
  - b. Chemical Change

13. Pancake cooking would be considered a
- Physical Change
  - Chemical Change
14. Performing a distillation would be considered a
- Physical Change
  - Chemical Change
15. CH<sub>4</sub> contains:
- Metallic
  - Covalent
  - Ionic
  - Neither
  - Both Covalent and Ionic
16. HNO<sub>3</sub> contains:
- Metallic
  - Covalent
  - Ionic
  - Neither
  - Both Covalent and Ionic
17. Cl<sub>2</sub> contains:
- Metallic
  - Neither
  - Ionic
  - Sharing of electrons
  - Both Covalent and Ionic
18. Balance the following chemical equation. Write the answer in your answer sheet as a list separated by semicolons.
- $$\underline{\quad} \text{Cu} + \underline{\quad} \text{HNO}_3 \rightarrow \underline{\quad} \text{Cu}(\text{NO}_3)_2 + \underline{\quad} \text{H}_2\text{O} + \underline{\quad} \text{NO}_2$$
19. Balance the following chemical equation. Write the answer in your answer sheet as a list separated by semicolons.
- $$\underline{\quad} \text{FeS} + \underline{\quad} \text{O}_2 \rightarrow \underline{\quad} \text{Fe}_2\text{O}_3 + \underline{\quad} \text{SO}_2$$

Match the following chemical names with their chemical formulas.

- |                         |                                    |
|-------------------------|------------------------------------|
| 20. Ammonia             | a. H <sub>2</sub> O <sub>2</sub>   |
| 21. Isopropyl alcohol   | b. NaClO                           |
| 22. Hydrogen Peroxide   | c. MgSO <sub>4</sub>               |
| 23. Magnesium Sulfate   | d. NH <sub>3</sub>                 |
| 24. Sodium hypochlorite | e. CaCO <sub>3</sub>               |
| 25. Acetic Acid         | f. C <sub>3</sub> H <sub>8</sub> O |
| 26. Calcium Carbonate   | g. CH <sub>3</sub> COOH            |

List the scientific names for the following organisms:

- 27. Mayapple-
- 28. Ongaonga-
- 29. Jimson Weed-
- 30. Poison Oak-
- 31. Death-Cap Mushroom-
- 32. Poison Ivy-

1

33. Identify (BE SPECIFIC OR YOU WILL NOT RECEIVE POINTS!!!)



34. Identify (BE SPECIFIC OR YOU WILL NOT RECEIVE POINTS!!!)



35. Identify (BE SPECIFIC OR YOU WILL NOT RECEIVE POINTS!!!)



36. Which of the following is a Brown Recluse Spider?



a.



b.

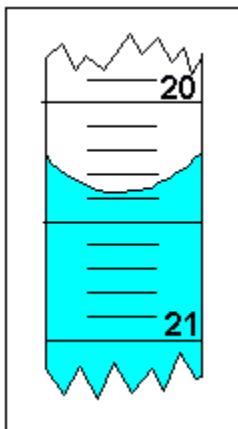


c.



d.

37. The solution presented in the beaker has is 12.5% concentration of salt. If one would desire a solution of 30.0% concentration of salt, What must be done to the existing solution?



38. In your own words, briefly describe what “LD50” means.

39. Repeated exposure to low levels of herbicides over a long period of time is \_\_\_\_\_ exposure?

- a. Chronic
- b. Acute
- c. AN LD50
- d. A synergistic

40. What is the “NOEL” level?

41. An owner had 6 cats. After feeding all 6 with a new cat dish with Xmg of iron, 3 died.

Based on the study what can be concluded?

- a. The LC50 is Xmg
- b. No conclusion
- c. The LD50 is Xmg
- d. The half-life of iron for cats is Xmg



### Answer Key

1. c

2. g

3. g

4. Sand in water, mud

5. Salt water, lemonade

6. b,d

7. Molecule is two or more atoms joined together chemically. Compound is a molecule that contains at least two different elements. (All compounds are molecules but not all molecules are compounds).

8. a

9. b

10. b

11. b

12. a

13. a and b

14. a

15. b
16. e
17. d
18. 1;4;1;2;2
19. 4;7;2;4
20. d
21. f
22. a
23. c
24. b
25. g
26. e
27. Podophyllum peltatum
28. Urtica ferox
29. Datura stramonium
30. Toxicodendron diversilobum
31. Amanita phalloides
32. Toxicodendron radicans
33. Poison ivy (Toxicodendron radicans)
34. Mayapple (Podophyllum peltatum)
35. Fattail scorpion (Androctonus australis)
36. a
37. a)  $(.125 * .0204) = .00255$  moles (amt of solute);  $(.300 * .0204) = .00612$  moles (solute);  $.00612/.00255 = 2.4x$  orig. Solute amount needed,  $2.4 - 1 = 1.4$ , Add 1.4 times as much salt (solute) to the solution  
 b) Boiling method: Boil out solvent until final volume of solution is 1/2.4 of original volume (final volume is 8.5 mL);  $(.3 / 20.4) = (.125 / x)$  so  $x = 8.5$  mL as final volume
38. Lethal dose (LD50) is the amount of an ingested substance that kills 50 percent of a test sample. It is expressed in mg/kg, or milligrams of substance per kilogram of body weight.  
 Common name. Toxin. Lethal doses.
39. a
40. NOEL stands for No Observable Effect Level (toxicology); greatest concentration or amount of a substance, found by experiment or observation, that causes no alteration of morphology, functional capacity, growth, development, or lifespan of the target organism distinguishable from those observed in normal (control) organisms of the same species and strain under the same defined conditions of exposure.
41. b