**Matter - Physical Science Study Guide**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

\_\_\_\_ 1. What type of matter is sweat tea?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Element | c. | Heterogeneous Mixture |
| b. | Compound | d. | Homogeneous Mixture |

\_\_\_\_ 2. What kind of matter is oil and water?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Element | c. | Homogeneous Mixture |
| b. | Compound | d. | Heterogeneous Mixture |

\_\_\_\_ 3. What type of matter is chili?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Element | c. | Homogeneous Mixture |
| b. | Compound | d. | Heterogeneous Mixture |

\_\_\_\_ 4. What type of matter is Carbon Monoxide (CO)?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Element | c. | Homogeneous Mixture |
| b. | Compound | d. | Heterogeneous Mixture |

\_\_\_\_ 5. What kind of matter is table salt (NaCl)?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Element | c. | Homogeneous Mixture |
| b. | Compound | d. | Heterogeneous Mixture |

\_\_\_\_ 6. A solid rubber stopper has a mass of 33.0 g and a volume of 30.0 cm3. What is the density of rubber?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 0.91 cm3 | c. | 1.1 g/cm3 |
| b. | 990 g/cm3 | d. | 990 cm3 |

\_\_\_\_ 7. A disk of pure platinum is placed into a graduated cylinder that has a volume of 35 ml. After the object is placed into the graduated cylinder the volume rises to 41 ml. The disk of pure platinum has a mass of 128.4 g What is the density of the platinum disk?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 3.668 g/ml | c. | 0.0467 g/ml |
| b. | 21.4 g/ml | d. | 3.13 g/ml |

\_\_\_\_ 8. A bar of pure gold has a mass of 575 g and a volume of 29.8 cm3. What is the density of the gold bar?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 11,098 cm3 | c. | 0.0518 g/cm3 |
| b. | 0.34 g | d. | 19.3 g/cm3 |

\_\_\_\_ 9. A chunk of wax has a mass of 50.4 g and a volume of 57.9 ml. What is the density of wax?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 0.87 g/ml | c. | 8.7 ml |
| b. | 3,149.8 g | d. | 1.15 g/ml |

\_\_\_\_ 10. You have collected a sample of seawater and determined that the mass is 1,025 g through the use of a triple beam balance. You pour the sea water into a graduated cylinder and determine that the volume is 1,000 ml. What is the density of the seawater?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 1,025 ml | c. | 0.975 g/ml |
| b. | 1.025 g/ml | d. | 97.6 g |

**Short Answer**

11. A block of aluminum is dropped into a graduated cylinder with an initial volume of water at 150 mL and the volume rises to 225 mL. If the block has a mass of 35.5 g, what is its density?

m = D = m

V

V =

12. Mercury metal is poured into a graduated cylinder and measures exactly 12.75 mL. The mercury used to fill the cylinder has a mass of 475.0 g. From this information, calculate the density of mercury.

m = D = m

V

V =

13. A rectangular block of copper metal has a mass of 2896 g. The dimensions of the block are 12.4 cm by 10.5 cm by 14.6 cm. From this data, what is the density of copper?

m = D = m

V

V =

14. A flask that has a mass of 566.7 g is filled with 250 mL of carbon tetrachloride. The mass of the flask and carbon tetrachloride is found to be 1495.2 g. From this information, calculate the density of carbon tetrachloride.

m = D = m

V

V =

15. A graduated cylinder contains 100 mL of a liquid. The mass of the graduated cylinder with the liquid is 145 grams. The mass of the graduated cylinder when empty is 45 grams. What is the density of the liquid?

m = D = m

V

V =

16. Explain the differences between Boyle’s Law and Charles’s Law?

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17. Explain in detail, the differences in solids, liquids, and gases based on their molecular state. (Hint: Describe the move of the molecules in each state of matter).

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18. What happens to the speed of the particles inside an air-filled balloon if the temperature of the balloon increases. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. What happens to the temperature of a substance during a phase change?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. What happens to the arrangement of water molecules as water melts and freezes?

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21. Explain why sublimation and deposition are classified as physical changes.

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22. How does increasing the temperature affect the pressure of a contained gas?

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23. What happens to the pressure of a gas if the volume is reduced?

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24. What three factors affect gas pressure?

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**Essay**

25. Compare and contrast liquid water and ice in terms of how definite their shapes and volumes are.

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26. How are pressure and volume of a gas related?

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**Answer Section**

**MULTIPLE CHOICE**

1. ANS: D PTS: 1

2. ANS: D PTS: 1

3. ANS: D PTS: 1

4. ANS: B PTS: 1

5. ANS: B PTS: 1

6. ANS: C PTS: 1

7. ANS: B PTS: 1

8. ANS: D PTS: 1

9. ANS: A PTS: 1

10. ANS: B PTS: 1

**SHORT ANSWER**

11. ANS:

D= 0.47 g/cm3

PTS: 1

12. ANS:

D= 37.25g/cm3

PTS: 1

13. ANS:

D= 1.45 g/cm3

PTS: 1

14. ANS:

D= 3.71 g/cm3

PTS: 1

15. ANS:

D= 1g/cm3

PTS: 1

16. ANS:

Charles law states the volume of gas is directly proportional to its temperature in kelvins if the pressure and the numbre of particles of a gas are constant.

Boyles law states the volume of a gas is inversely proportional to its pressure if the temperature and the number of particles are constant.

PTS: 1

17. ANS:

Majority of all solids have an orderly arrangement of moecules that are packed close together.

The arrangement of molecules of a liquid are more spread out allowing molecules to move in order for the liquid to take the shape of the containor.

The arrangement of molecules of a gas are the most spread out and mobile of the 3.

PTS: 1

18. ANS:

The particles in the air move faster, on average, when the temperature increases because they have more kinetic energy.

PTS: 1

19. ANS:

The temperature of a substance does not change during a phase change.

PTS: 1

20. ANS:

The arrangement of molecules become less orderly as water melts and more orderly as water freezes.

PTS: 1

21. ANS:

A substance’s identity does not change during sublimation and deposition.

PTS: 1

22. ANS:

Raising the temperature will increase the pressure if volume and number of particles are constant.

PTS: 1

23. ANS:

If the volume is reduced, the pressure of a gas increases if temperature and volume are constant.

PTS: 1

24. ANS:

Temperature, volume, and number of particles

PTS: 1

**ESSAY**

25. ANS:

.Both liquid water and ice have a definite shape. Ice has a definite shape, but liquid water does not.

PTS: 1

26. ANS:

They are inveresly proportional. If pressure is increased then the volume will be decreased.

PTS: 1