Name: KEY

Matter Unit Test

**Introduction To Matter Section 1 – Multiple Choice Questions are 4 points each**

D 1. **Matter is defined as any object that ____.**

a. Has mass
b. Has volume — if it has mass, it must have volume
c. Is alive - Metals | salt, sugar not alive but matter
d. Has mass and volume (takes up space)

C 2. **Which of the following statements about the periodic table is TRUE?**

a. All elements on the periodic table belong to the same family.
b. Elements on the periodic table are organized by where they are found in nature. - #+ weight
c. Elements on the periodic table are unique from each other, but do share common characteristics with other elements.
d. Elements on the periodic table can be broken down into more simple substances. - they cannot

B 3. **A piece of iron and a piece of gold have the same mass. Which statement best describes the metals?**

a. The amount of matter in the iron is different than the amount of matter in the gold. - not enough info
b. The number of atoms in the iron is different than the number of atoms in gold.
c. The melting point of the iron is the same as the melting point of the gold. different atoms
d. The volume of the iron will be the same as the volume of gold. - not enough info

B 4. **If we were to describe the relationship between atoms, matter and elements, using the United States, which of the following statements is true?** Small Large Medium

a. The whole US would be atoms, each state would be elements and the cities in that state would be matter. - L - M - S
b. The whole US would be matter, each state would be elements and the cities in that state would be atoms. L M E
c. The whole US would be elements, each state would be atoms and the cities in that state would be matter.
d. The whole US would be matter, each state would be atoms and the cities in that state would be elements.

1. Which statement is correct?
   a. Something with a density greater than one will float in
   b. Something with a density equal to one will float in water.
   c. Something with a density less than one will float in water.

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## Properties of Matter Section 3

B 8. You have three blocks of silver at varying sizes: 10 pound, 20 pound, and 30 pound. Which of the following statements is true?

a. The blocks will have the same volume. - different sizes
b. The blocks will have the same melting point. - all silver
c. The blocks will have different densities because they are different masses. same atoms
d. The lighter the block, the higher the boiling point. - same atoms

***Read the chart of material substance densities.***

| Substance | Density |
|---|---|
| Mercury | 13.5 g/cm$^3$ |
| Mineral Oil | 0.8 g/cm$^3$ ← less dense |
| Water, fresh | 1.0 g/cm$^3$ |
| Water, salt | 1.03 g/cm$^3$ |

A 9. What will happen when mineral oil is poured into a beaker of fresh water?

a. The mineral oil will float.
b. The mineral oil will mix with the water.
c. The mineral oil will sink.
d. The mineral oil will freeze.

| Substance #1 | Substance #2 |
|---|---|
| Mass – 60 grams D= 2 | Mass – 5 grams D= 0.5 |
| Volume – 30 cm$^3$ | Volume – 10 cm$^3$ |

A 10. Which of the following statements would be a good conclusion about density for Emma?

a. Substance #1 will have a greater density than substance #2.
b. Substance #2 will have a greater density than substance #1.
c. The substances will have the same density because they have the same volume.
d. There is not enough data to make a conclusion about density.

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C 11. **Mrs. Miles measured two different blocks to see their volume and their mass. Her data is below. What should her conclusion about the blocks be?**

| Characteristic | Block 1 | Block 2 |
|---|---|---|
| Mass | 20 grams | 40 grams |
| Volume | 5 mL | 10 mL |
| Density | 4 g/mL$^3$ | 4 g/mL$^3$ |
| Boiling Point | 200°F | 200°F |

a. The blocks come from two different types of material. BP + D equal
b. The blocks are the same material because they have the same mass and volume.
c. The blocks are the same material because they have the same density and boiling point.
d. There was an error in her data collection because it is impossible for this to happen.

_____ 12. **Which of the following would happen if we placed the blocks in #11 in liquid lead that has a density of 11.3 g/mL$^3$?** D=4

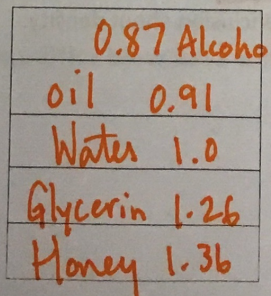
4 < 11.3

a. The blocks would float
b. The blocks would sink
c. The blocks would separate
d. Not enough data to determine an answer

*Use the chart below to answer the questions that follow.*

| Material | Density |
|---|---|
| Dark Karo syrup or maple syrup | 1.37 |
| Light Karo syrup | 1.33 |
| Water with food coloring | 1.00 |
| Glycerin (colorless) | 1.26 |
| Vegetable Oil (yellow) | 0.91 |
| Dawn dish washing liquid (blue) | 1.03 |
| Rubbing alcohol (colorless) | 0.87 |
| Lamp oil | 0.80 |
| Honey | 1.36 |
| Baby oil | 0.82 |

13. **You put rubbing alcohol, honey, water, vegetable oil and glycerin into a graduated cylinder. Please draw what this would look like based on their densities in the chart. (5 points)**



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C 14. **Which statement is true?**

a. the density of lamp oil > the density of baby oil (.8 > .82)

b. the density of light Karo > the density of dark Karo (1.33 > 1.37)

c. the density of rubbing alcohol < the density of water (.87 < 1.0)

d. the density of water = the density of Dawn dish soap (1.0 = 1.03)

A 15. **All of the statements are true, EXCEPT?**

a. Water will sink in glycerin (1.0 / 1.26)

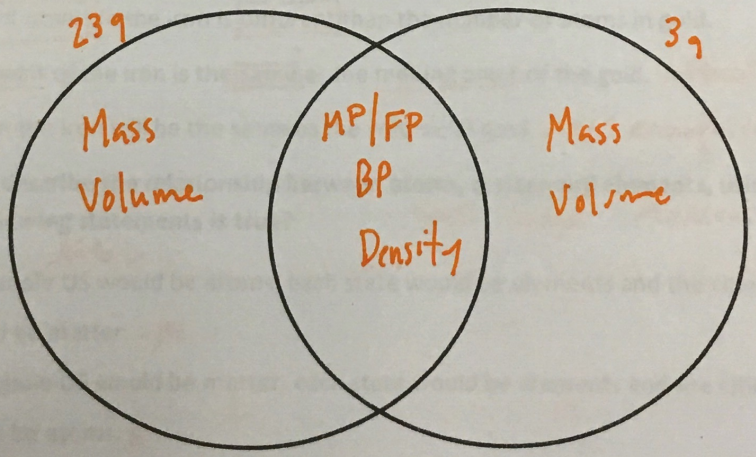
b. Light Karo will float on dark Karo (1.33 vs. 1.37)

c. Rubbing alcohol will sink in lamp oil (.87 / .80)

d. Glycerin will float on honey (1.26 / 1.36)

**Short Answer Section 4**

16. Mr. Sturidvant has 2 blocks of iron. One block has a mass of 23 grams and the other block has a mass of 3 grams. Help Mr. Sturdivant compare the following properties of the two blocks: you must place the following words in the correct place on the Venn Diagram: **melting point/freezing point, volume, mass, boiling point and density.** (10 points)




Bonus: While playing in your back yard you come across a metal object. The mass of the object is 293.8 grams. You place the object into a cylinder of water that started at 10 mL. The water rises to 23 mL. Using the chart below, what type of metal is this object? **Show your work!**

| Densities of solids in g/mL at 1 atm, 25°C | |
|---|---|
| osmium | 22.6 |
| gold | 19.3 |
| iron | 7.9 |
| aluminum | 2.70 |
| sodium chloride | 2.16 |
| sugar | 1.59 |
| h.d. polyurethane | 1.05 |
| wood (pine) | .3 - .5 |
| lithium | 0.53 |

$\frac{293.8}{13} = 22.6\ g/cm^3$

| | |
|---|---|
| Andres | Jordan |
| Isabella | Cayleigh |
| Abbey | Maddie |
| Alex Swartz | Emmanuel |
| Kiera | |

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that

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**5. How many protons, neutrons and electrons does the element Aluminum have if its atomic # is 13 and its atomic mass is 27? (6 points)**

P = 13 N = 14 E = 13

**Phases of Matter Section 2**

**Use the primary source below to answer the questions that follow.**

Chorus:

If energy is entering

The particles speed up and bring

A Solid to a liquid, then a liquid to a gas

But if the energy is exiting

The particles slow naturally

From gases to liquids, then liquids to solids

Come on

The states of matter cycle all around

*Taken from "Shake" on Discovery Education*

**6. Looking at lines 1-3, explain how adding energy to matter can change its state. (6 points)**

if you add energy the molecules speed up and spread out.

**7. Using lines 4-6, draw how the molecules differ between a solid, liquid and a gas. (6 points)**

S L G