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

**Property and Density Worksheet**

1. Why do you need many non-characteristic properties to identify a substance, but may only need one characteristic property to identify it?

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2. Four students were given the task to identify an unknown substance. Each student thought of a different test they could use to identify the substance.

Bob wanted to weigh the substance

Carol wanted to take its temperature

Fred wanted to find its melting point

Sue wanted to smell it

Whose method would allow them to identify the object and why it would work? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3. Explain how you would find the following substances.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Volume of Water | Volume of a Regular Solid | Volume of an Irregular Solid | Mass of a Liquid | Mass of a Regular Solid | Mass of an Irregular Solid |
|  |  |  |  |  |  |

*Show all calculations for the following questions*

4. An eraser had a mass of 6g and a volume of 4 cm3. What is the density of the eraser?

5. A paper’s length is 3cm, its width is 3.5cm and its height is 2.3cm. Its mass is 4.5g. What is its density?

6. A paper’s length is 3cm, its width is 3.5cm and its height is 2.3cm. Tis mass is 4.5g. What is its density?

7. Keys were put into a beaker with 40mL of water. When the keys were put in, the water rose to 44mL. The mass of the keys was 2.1g. What was the density of the keys?

8. 15mL of juice was put into a graduated cylinder weighing 45g. The cylinder and juice weighed 47g together. What was the density of the juice?

9. A stone was put into 100mL of water. The water rose 4mL with the stone. The stone weighs 3.4g. What is the stone’s density?

10. A pen was put into 33mL of water, the water rose to 35.5mL with the pen. The pen’s mass was 1.2g. What is its density?

11. Use the table to determine the density of a rock.

|  |  |  |
| --- | --- | --- |
| Mass | Volume of water in the cylinder | Volume of water + rock |
| 15 g | 100 mL | 103 mL |

12. Use the table to determine the density of apple juice.

|  |  |  |
| --- | --- | --- |
| Volume | Mass of the Graduated Cylinder | Mass of Graduated Cylinder + Juice |
| 30 mL | 35 g | 69 g |

13. In a lab, the following information was given:

|  |  |  |  |
| --- | --- | --- | --- |
| Liquid | Mass | Shape | Volume |
| 1 | 223 g | Cylindrical | 82 mL |
| 2 | 223 g | Cubic | 25 mL |
| 3 | 113 g | Round | 25 mL |
| 4 | 38 g | Cubic | 14 mL |

Which 2 substances are the same? *Show your work.* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. You have an unknown liquid you think is vinegar. You know the density of vinegar is 1.5 g/mL. You also know the mass of the unknown is 5.5g and its volume is 2mL. Explain is your unknown is vinegar.

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15. Walking on a beach, three friends found something shiny in the water. Bob was sure it was a piece of gold. Jack was sure it was something caller Fool’s Gold. Fool’s Gold looks like gold but it is worthless. Carol was sure it was a piece of copper. They decided to perform tests to determine who was correct. They found the mass of the solid to be 17g. They put the piece of solid in 10mL of water. The water rose to 13mL with the solid. Bob knew the density of gold was 17 g/cm3, Jack knew the density of Fool’s Gold was 13 g/cm3 and Carol knew the density of copper was 3 g/cm3. Which person was right, or were they all wrong? *Show your work.*

16. Five Different lab groups are asked to find the density of water. They are each told to use a different amount of water. Explain the procedure used to find the density and determine is all the groups should come up with the same density.

17. You find a transparent mineral and you think it might be a piece of quartz. You know the density of quartz is 2.4 g/cm3. You find the objects mass, which is 4.3g and its volume, which is 2.4 g/cm3. Answer the following questions:

a) How did you find the mass of the object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) How did you find the volume of the object (method)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) Is the object you found a piece of quartz? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. Explain if a rectangular and a cubed piece of iron will have the same density.

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