

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

## Answer Key: Escape the Lab: 5th Grade Metric Precision Challenge

Calculate volume using graduated cylinders and differentiate between mass and weight to ensure your scientific results are accurate and reproducible.

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**1. An oceanographer is measuring the salinity of a water sample. To ensure 'precision,' what must the scientist do?**

**Answer:** B) Repeat the measurement multiple times and get nearly the same result.

Precision refers to the consistency of results. If you measure something multiple times and get the same value, your measurements are precise, even if they aren't perfectly accurate.

**2. A baker needs to convert 4 kilograms of flour into grams for a large recipe. How many grams is this?**

**Answer:** C) 4,000 grams

The prefix 'kilo-' means 1,000. Therefore, 4 kilograms multiplied by 1,000 equals 4,000 grams.

**3. True or False: A graduated cylinder should be read at the top of the curve (meniscus) of the liquid.**

**Answer:** B) False

In most liquids, like water, you must read the volume at the bottom of the curve, known as the meniscus, to get an accurate measurement.

**4. Which tool would a botanist use to measure the exact amount of 'transpiration' (water loss) in milliliters from a leaf?**

**Answer:** C) A graduated cylinder

Milliliters are a unit of volume for liquids, and a graduated cylinder is the standard lab tool designed to measure liquid volume accurately.

**5. A marathon runner covers a distance of 10 kilometers. If you were recording this in the base SI unit for length, how many meters would that be?**

**Answer:** C) 10,000 meters

Since 1 kilometer equals 1,000 meters, 10 kilometers equals 10,000 meters.

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**6. True or False: Mass and weight are the same thing because they both measure how much 'stuff' is in an object.**

**Answer:** B) False

Mass is the amount of matter in an object and stays the same anywhere. Weight is the measure of gravity pulling on that mass and changes based on location (like on the moon).

**7. If you are measuring the temperature of a chemical reaction and it increases by 10 degrees Celsius, why might a scientist record this in Kelvin instead?**

**Answer:** A) Kelvin is the SI base unit for temperature used in global science.

While Celsius is common, Kelvin is the official International System of Units (SI) base unit for thermodynamic temperature.

**8. To find the volume of an irregular object like a jagged rock, a student uses water displacement. The water rises from 50mL to 65mL. What is the volume of the rock?**

**Answer:** B) 15 mL

The volume of an irregular object is found by subtracting the initial volume from the final volume ( $65 - 50 = 15$ ).

**9. True or False: The metric system is based on multiples of 10, making it easier to convert between units than the imperial system.**

**Answer:** A) True

The metric system (SI) is a decimal-based system, meaning units increase or decrease by powers of 10 (milli, centi, kilo).

**10. A scientist is testing a new LED bulb. Which SI unit would they use to measure the 'brightness' or luminous intensity of the light emitted?**

**Answer:** C) Candela

The candela is the SI base unit specifically used to measure the intensity of light as perceived by the human eye.