Name: _____ **Date:** _____

Answer Key: Crush These SI Standards: A 10th Grade Measurement Challenge

Dimensional analysis, base unit identification, and magnitude recognition. Build the foundational precision required for advanced laboratory chemistry and physics simulations.

---

1. In the laboratory, you are asked to measure the potential difference across a terminal. Which SI unit will you use to record your data?

Answer: B) Volt

Potential difference is measured in Volts (V), which is the standard derived SI unit for electric potential.

2. The kilogram is unique among SI base units because it is the only one defined by a physical artifact rather than a fundamental constant of nature.

Answer: B) False

As of 2019, all SI units, including the kilogram, are defined by fundamental physical constants (like Planck's constant) rather than physical prototypes.

3. Scientists measuring the frequency of light waves utilize the _____ as the standard unit of measurement.

Answer: C) Hertz

Hertz (Hz) is the SI unit for frequency, defined as one cycle per second.

4. When measuring the distance between stellar bodies in our galaxy, astronomers often convert light-years into which SI base unit?

Answer: C) Meters

While kilometers are common, the actual SI base unit for length or distance is the meter.

5. To calculate the pressure of a gas inside a sealed chamber, a 10th-grade student should record the final value in _____.

Answer: B) Pascals

Name: _____ **Date:** _____

The Pascal (Pa) is the SI derived unit for pressure, defined as one Newton per square meter.

6. The Kelvin scale is an absolute temperature scale where 0 K represents the point at which all molecular motion ceases.

Answer: A) True

Absolute zero (0 K) is the theoretical temperature where particles have minimum thermal motion.

7. Which of the following is considered a 'supplementary' or 'derived' unit rather than one of the seven fundamental SI base units?

Answer: B) Newton

The Newton is a derived unit ($kg·m/s^2$), whereas the Candela, Mole, and Ampere are all fundamental base units.

8. The prefix 'nano-' in the metric system represents a factor of _____.

Answer: C) One billionth

Nano denotes 10 to the power of negative 9, which is one billionth.

9. An measurement that is 'precise' must also be 'accurate' according to scientific standards.

Answer: B) False

Precision refers to the repeatability of results, while accuracy refers to how close a measurement is to the true value; a tool can be precisely wrong.

10. If a chemist is measuring the 'luminous flux' or the total amount of light emitted by a source per unit time, they utilize the:

Answer: A) Lumen

The Lumen (lm) is the SI derived unit for luminous flux, distinct from the Candela which measures intensity in a specific direction.