Exponents & Scientific Notation Worksheet

KEY TERMS

- **Scientific Notation:** *a shorthand method of writing very small & very large numbers in which the numbers are expressed in terms of exponents of 10*
  - Form: $a \times 10^n$, where $1 \leq |a| < 10$
  - If you moved the decimal left, *n* is positive
  - If you moved the decimal right, *n* is negative

Illowsky, B., & Dean, S. (2018). Introductory statistics

Samples of the Mokauea fishpond's water are taken & sent to a lab to measure various water quality measurements. These parameters are often measured in micromoles per liter or (µmol/L) micrograms per liter (µg/L). Sometimes, we need to convert measurements like these or look at them in a different way to thoughtfully understand them. Complete the exercises below to help us do that.

EXERCISE 1: SCIENTIFIC NOTATION

Write the following water parameter measurements, from May 2020, in scientific notation.

Total N: 79.18 µg/L _____

Total P: 7.24 µg/L _____

Silicate: 109.69 µg/L _____

Ammonia: 0.39 µmol/L _____

Phosphate: 0.06 µmol/L _____

EXERCISE 2: SCIENTIFIC NOTATION IN APPLICATION (PART 1)

In May 2020, Chlorophyll A measured to be 0.66 µg/L on the mauka end of the fishpond.

What is 0.66 µg/L in scientific notation?

If $1\,microgram = 1 \times 10^{-6} grams$, what is 0.66 µg/L in grams? Use exponents rules to help you. Write your answer in scientific notation.

EXERCISE 3: SCIENTIFIC NOTATION IN APPLICATION (PART 2)

In July 2020, Total P measured to be 5.9 µg/L at the makai end of the fishpond.

What is 5.9 µg/L in scientific notation?

If $1\ microgram = 1,000\ nanograms$, what is 5.9 µg/L in nanograms? Write your answer in scientific notation.

EXERCISE 4: SCIENTIFIC NOTATION IN APPLICATION (PART 3)

In July 2020, silicate measured to be 203.15 µg/L at the center of the fishpond.

What is 203.15 µg/L in scientific notation?

If $1\ gigagram = 1 \times 10^{9} grams$, what is 203.15 µg/L in gigagrams? Write your answer in scientific notation.

EXERCISE 5: USING SCIENTIFIC NOTATION TO COMPARE RESULTS

In May 2020, the measurements for Chlorophyll A are as follows. Write each in standard form.

Sample I.D.	Chlorophyll A µg/L	Scientific Notation
Makai	0.84	
Center	5.98	
Mauka	1.58	

Which is the smallest sample measurement? Explain why by comparing the scientific notations.