

SEED Academy, Spring 2009  
Synthetic Biology Module

Quiz #3  
March 28, 2009

**NO Calculators Allowed**

- 1) Warm up question...How many microliters are in one milliliter?
  
- 2) **Calculate** the molarity of water (at 4C), show ALL work. (Hint what does molarity mean? Assume that the molecular weight of water is 20 g/mol, and that the density is 1 g / mL at 4C)
  
- 3) For this question, assume that each *nucleotide* (*not pair!*) weights 500 Da.
  - a. What is the molecular weight of a 2000 nucleotide length *double stranded* piece of DNA?
  
  - b. What is the molarity of a 40 ug / mL solution of the DNA from part a?
  
  - c. How much of the solution from part b do you need to make 50 uL of a 2 pM solution?
  
  - d. Complete the reaction master mix with the answer from part c, (your enzyme stock is 100 mg/mL):

Reaction Buffer (10X):	_____
DNA (final 1pM):	_____
Enzyme (final 1 mg):	_____
Water	_____
	_____
Total Volume	<u>50 uL</u>