

## **Temperate Rainforest Biogeochemistry Literacy Quiz**

The study of biogeochemistry requires one to be familiar and fluent with basic concepts from chemistry, physics, and algebra. While the following quiz covers some of the basic concepts needed, it is an assessment tool not a study guide. You should have a pretty good idea of the answers to almost all of these questions on your first read through the quiz and should be able to answer every question with a brief refresher reading or two. If this is not your experience, you probably will have a difficult time in this program.

1. How are the elements of the periodic table organized?
2. What is an organic molecule?
3. What is osmosis and how does it?
4. What is potential energy?
5. What is entropy?
6. What are the first and second laws of thermodynamics?
7. What are isotopes?
8. Define the following: oxidation, reduction, covalent bond, ionic bond.
9. Expand the equation:  $y = (m+x)^2$
10. What do the following units stand for: ppb, ppm, mol/kg, mg/l,  $\text{kg} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ , kcal/mol?
11. Identify the following: C, H, N, O, P, S, Al, Fe,  $\text{CaCO}_3$ ,  $\text{PO}_4^{3-}$ ,  $\text{Fe}^{2+}$ , HCl,  $\text{CO}_2$ ,  $\text{N}_2$
12. Balance this equation:  $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ .
13. You need to make 200 mls of 70% ethanol (EtOH). Ethanol comes as a 95% solution. What are the amounts of 95% EtOH and distilled water you will mix together to create your solution?
14. Convert  $38 \times 10^{20} \text{g}$  to kg.
15. Convert  $\text{g C m}^{-2} \text{s}^{-1}$  to  $\text{tons C ha}^{-1} \text{yr}^{-1}$ . List any assumptions you make.
16. What is the tangent of  $45^\circ$ ? Make a drawing that illustrates your solution.