**Chapter 3: Water and Life**

**-AP Biology Guided Reading-**

***Sections 1 and 2***

1. What is a polar molecule? Why is water considered polar?

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1. Draw a diagram to explain hydrogen bonding.
2. Explain the difference between adhesion and cohesion.

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1. Provide a real life example of adhesion, cohesion, and surface tension.

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1. Water has a high specific heat. What does that mean?

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1. Summarize how water’s high specific heat contributes to the moderation of temperature. How is this property important to life?

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1. What is heat of vaporization?

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1. We all know that ice floats. Consider what would happen if ponds and other bodies of water accumulated ice at the bottom. Describe why this property of water is important.

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1. Explain why ice floats. What is special about 40C?

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1. Define these terms:
   1. Solution \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Solvent \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Solute \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. After a long night of studying AP Biology, you grab a cup of Starbucks and add sugar. What is the solute here? What is the solvent?

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1. Why is water such a good solvent?

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1. Explain the terms hydrophilic and hydrophobic. Provide an example of each.

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1. Calculate the molecular mass of glucose, C6H12O6.
2. Define molarity.

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***Section 3***

1. What two ions form when water dissociates?

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1. Define:
   1. Acid- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Base- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Because the pH scale is logarithmic, each numerical change represents a 10x change in the ion concentration.
   1. How many times more acidic is a pH of 3 compared to a pH of 5? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. How many times more basic is a pH of 12 compared to a pH of 8? \_\_\_\_\_\_\_\_\_\_\_\_\_
3. Even a slight change in pH can be harmful. How do buffers moderate pH change?

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1. Briefly discuss the impact that human activity has on acid precipitation.

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