2.4 What makes water so important for life?

1. Statement: Water is a polar molecule that can form hydrogen bonds.
2. Why does ice float? Why is this a good thing for organisms that live in ponds and streams?
3. Hydrogen bonding between water molecules leads to a high specific heat and high heat of vaporization. How does this benefit organisms?
4. What is water’s cohesion?
5. Statement: Water is the dominant component of virtually all living organisms, and most biochemical reactions take place in this watery, or aqueous, environment.
6. What is an acid? What is a base?
7. pH is really a measure of what?
8. Which solution contains a higher concentration of H+: a pH 2 solution or a pH 5 solution?

Chapter 35 Transport in Plants

35.1

1. Whenever water moves by osmosis, what important rule always applies?
2. What is turgor pressure?
3. What is bulk flow? How does bulk flow in the xylem differ from bulk flow in the phloem?
4. What are aquaporins?
5. How do plants absorb mineral ions from the soil?
6. Statement: You do not need to know or differentiate apoplast and symplast.

35.2

1. Statement: Water and minerals are transported in a plant from the roots and up through the plant to the leaves in vessels called xylem.
2. Why doesn’t osmotic root pressure alone account for xylem transport?
3. Explain the transport of water up the xylem by explaining the transpiration-cohesion-tension mechanism.

35.3

1. What are stomata?
2. How does a plant balance its need to retain water with its need to obtain CO2 for photosynthesis?
3. Identify the function of guard cells. Describe the role of K+ in guard cells.
4. Explain why a plant might close its stomata during the daytime.
5. Discuss some factors that regulate the opening and closing of stomata.

35.4

1. What’s the difference between a source and a sink?
2. Plants are able to move sugars through the phloem sap. Explain the pressure flow model and how this movement of sugary sap occurs.

An additional resource:

Bozeman Science YouTube video: Plant nutrition and transport.