Water is Weird

adapted from: http://nanosense.sri.com/activities/finefilters/scienceofwater/FF_Lesson2Teacher.pdf

1. Why does all bonding occur between atoms, ions, and molecules?

2. Draw two water molecules. Label the atoms that make up each water molecule with their chemical symbol. If there is an electrical charge or a partial electrical charge on any of the atoms, indicate that by writing the symbols on the atoms.

+ = positive charge	- = negative charge
δ+ = partial positive charge	δ- = partial negative charge

Label the types of bonds formed between the atoms of one water molecule and between the two water molecules.

3. Explain the term "polar" molecule.

4. What is a hydrogen bond/how is it formed?

5. Define "specific heat".

6. Explain how a spider can walk on water.

7. Fill out the following table: Name and describe the four emergent properties of water that contribute to life and provide an example of a phenomenon in nature due to each of these properties.

Property of Water	Description	Example

8. Define:

Hydrophobic =

Hydrophilic =

Examine the following compounds or cellular components and their solubility in water in the table below. Based on their properties determine whether they are hydrophobic/hydrophilic and polar/nonpolar.

Compound	Soluble/Insoluble in water	Hydrophobic/Hydrophilic	Polar/Nonpolar
Sugar	Soluble		
Oil	Insoluble		
Salt	Soluble		
DNA	Soluble		
Cell Membrane	Insoluble		