Polarity Lab Activity

Name_____Pd: _____

Some covalent molecules are polar. A molecule is thought to be polar when there are observable attractions between the oppositely charged poles of the molecule and its neighbor molecules. One of these types of polar attractions is called hydrogen bonding, where the partially positive hydrogen atoms in a molecule are attracted to the negative poles (usually with lone pairs of electrons) of nearby atoms.

The polarity of a molecule is based upon the electronegativity difference between the atoms in the molecule. The greater the difference in electronegativity, the greater the polarity.   The shape of the molecule is also important.

Pre-Lab: Answer the following questions. Read page 267 in your textbook if you don't remember.

1. What is a polar covalent bond?

2. What are the two types of covalently bonded molecules?

3. What is a distinguishing factor for nonpolar molecules?

4. What do water, H_2O, and carbon tetrachloride, CCl_4, have in common?

5. Which is polar, water or carbon tetrachloride?

Procedure:
1. Follow the instructions at each station.
2. Complete the data collection for each station.
3. Answer the analysis questions for each station.

Station 1

Objective: Observe if solutions are formed when mixing 2 different liquids together.

Data Table:

Mixture	Observations
Water + Oil	
Water + Ethanol	
Oil + Ethanol	

Analysis and Conclusion:

1. Based on your answers to the pre-lab and your observations for station 1, is cooking oil a polar or a non-polar compound? How do you know?

2. Based on your answers to the pre-lab and your observations for station 1, is ethanol a polar or a non-polar compound? How do you know?

3. When you washed the glassware you used detergent. Is detergent polar, nonpolar, both or neither?

Stations 2 & 3

Objective: Observe if solutions are formed when mixing different solutes in water and cooking oil.

Data Table:

Mixture	Observations
Station 2	
Water + salt	
Water + sugar	
Water + cornstarch	
Station 3	
Oil + salt	
Oil + sugar	
Oil + cornstarch	

Analysis and Conclusion:

1. Which solutes were soluble in water? _____

2. Which solutes were soluble in cooking oil? _____

3. Classify the solutes from station 2 & 3 as nonpolar covalent, polar covalent, or ionic. Justify your answers.
    Salt:

    Sugar:

    Cornstarch:

4. Explain what you think the phrase "like dissolves like" means.