FLINN SCIENTIFIC

Name_____

It's in Their Nature

Data Tables

Part A. Solubility of Iodine

Solvent (Test Tube)			
Water (1)	Ethyl alcohol (2)	Hexane (3)	Toluene (4)

Part B. Miscibility of Solvents

Solvent Pair (Test Tube)		Solvent Pair (Test Tube)	
Water Ethyl alcohol (1)		Hexane Ethyl alcohol (4)	
Water Hexane (2)		Hexane Toluene (5)	
Water Toluene (3)		Toluene Ethyl alcohol (6)	

Part C. Solutes and Solvents

	Water	Ethyl alcohol	Hexane
Dextrose			
Potassium nitrate			
Cholesterol			
Benzoic acid			

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Post-Lab Questions *(Use a separate sheet of paper to answer the following questions.)*

1. In which solvents is iodine soluble? In which solvents is iodine insoluble?
2. Define the term miscibility, then circle the correct choice in each statement to summarize the miscibility of the solvent pairs tested in Part B:

   Water and ethyl alcohol are (miscible/immiscible).

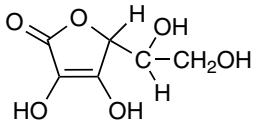
   Water and hexane are (miscible/immiscible).

   Water and toluene are (miscible/immiscible).

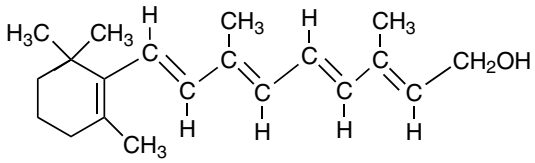
   Hexane and ethyl alcohol are (miscible/immiscible).

   Hexane and toluene are (miscible/immiscible).

   Toluene and ethyl alcohol are (miscible/immiscible).
3. Rank the four solvents tested in Parts A and B in order from most polar to least polar (nonpolar). Which two solvents are most alike in their polarity? Explain your reasoning.
4. Write a general statement describing the solubility of nonpolar solutes in different solvents and suggest a reason for this pattern.
5. Potassium nitrate (Part C) is an ionic compound. Write a general statement describing the solubility of ionic compounds in different solvents.
6. Dextrose, cholesterol, and benzoic acid are molecular (organic) compounds. Based on their solubility patterns in Part C, arrange these three solutes in order from most polar to least polar. Explain your reasoning.
7. Based on its solubility, would you expect cholesterol to be soluble in the bloodstream? Where does cholesterol tend to accumulate in the body? Why?
8. Vitamins are classified as either water-soluble or fat-soluble. The structures of Vitamin C (water-soluble) and Vitamin A (fat-soluble) are shown below. Identify the features of these molecules that give them their characteristic solubility.



Vitamin C



Vitamin A

9. The simple rule "Like dissolves like" is often used to describe the solubility of a substance in different solvents. Write a short paragraph discussing your evidence for this rule. Include in your discussion where you think this rule works best and where it seems to be less reliable. Give specific examples to back up your statements.
10. *(Optional)* A drop of motor oil spilled on wet pavement will quickly spread out into a thin film. A drop of water spilled on a greasy plate, however, will bead up into a little sphere. Use these observations, and the nature of solute–solvent interactions, to explain why oil and water do not mix.