

Unit 4 - Describing Substances

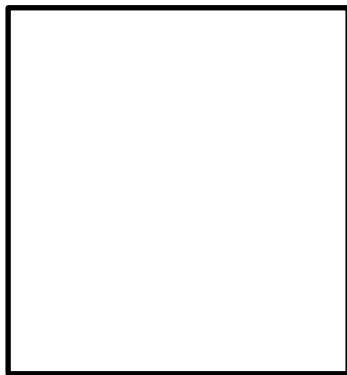
Pure Substances Vs. Mixtures Activity

- List below the properties that we have studied so far that can be used to identify substances

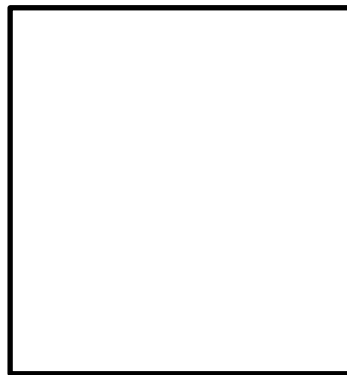
- Let's compare two substances, water and ethanol, based on the properties which you enumerated above

Property	water	ethanol
appearance		
odor		
flammability		
density		
m.p.		
b.p.		
Specific heat		
Ability to dissolve sugar		

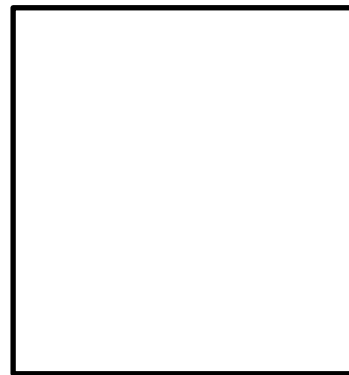
- Represent at the particle level the mixtures of sugar and water, ethanol and sugar, and ethanol, water and sugar.



Water and Sugar



Ethanol and Sugar

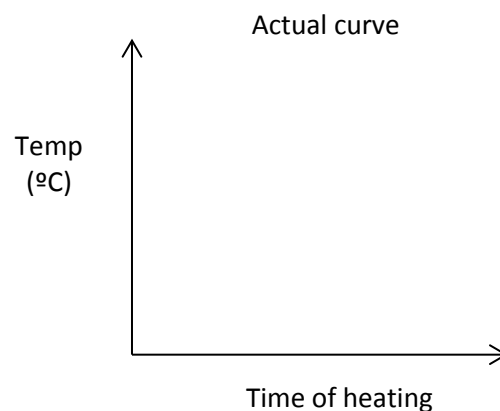
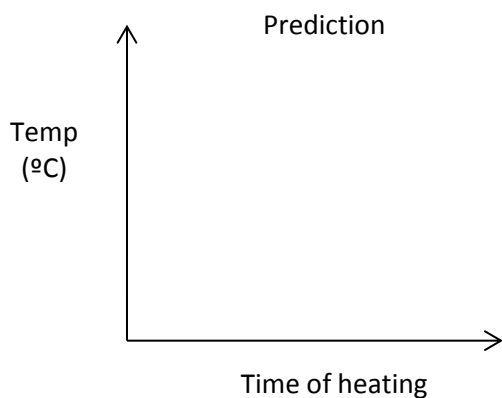


Water, Ethanol and Sugar

- From the solubility of sugar in alcohol, water and in the mixture, and the burning money demo, what can you conclude regarding the properties of a mixture?
- Based on your answer above, what do you think will be the density of a 50-50 mixture of ethanol and water?
- Your group has been assigned to find the density of a mixture of water and ethanol with a specific ratio. In the table below, collect the data from each group.

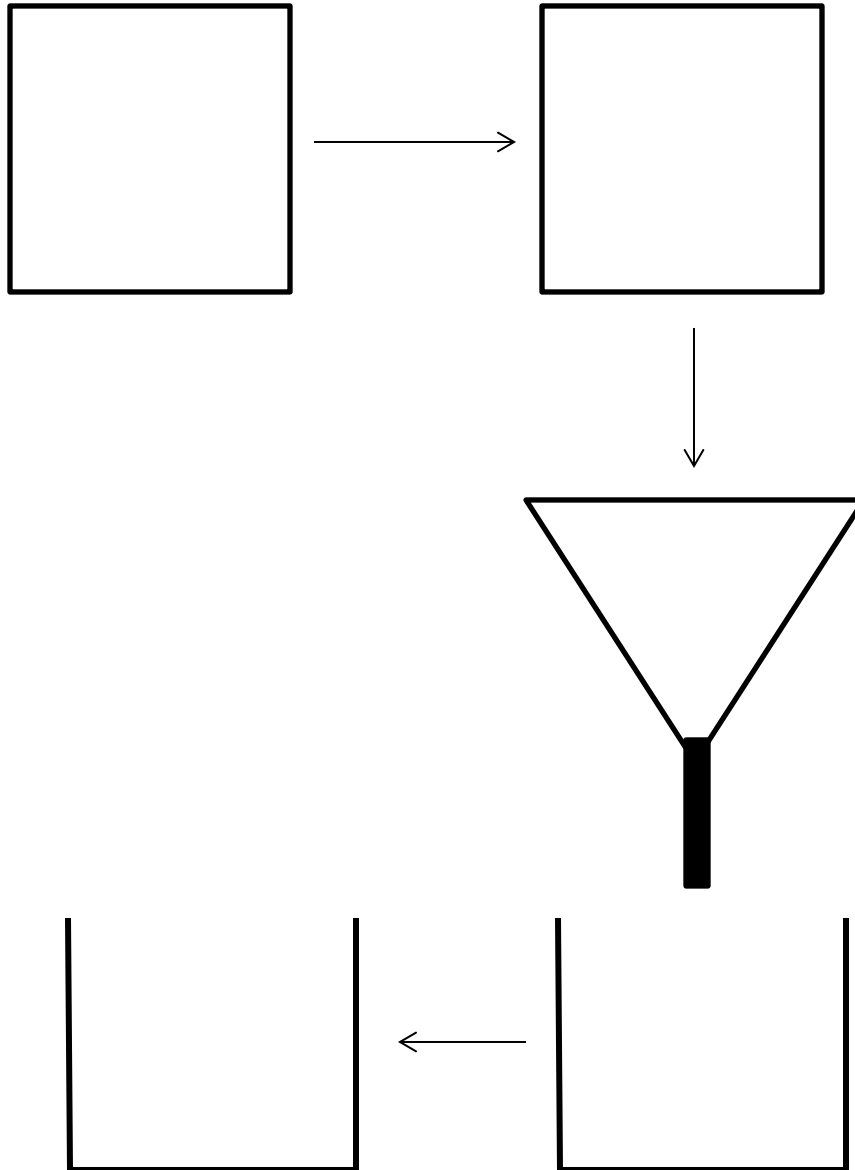
Group	Water/EtOH Ratio	Density
1	50:50	
2	50:50	
3	80:20	
4	80:20	
5	20:80	
6	20:80	
7	90:10	

- How does the data above support your conclusion about the properties of mixtures?
- A 50-50 mixture of water and ethanol at 25°C is heated until it is completely boiled away. Based on your understanding of mixtures, sketch on the graph below left, what you think the heating curve will look like. After producing the actual curve, sketch it on the graph below right.



9. Based on the difference in boiling points, it is possible to separate a mixture of water and ethanol. Perhaps all mixtures can be separated by taking advantage of the difference in properties. How would you separate a mixture of sand and salt? Explain the process below and draw a particle level diagram of each step in the separation starting with the mixture. Explain what happens on each step.

Salt and Sand Mixture



10. How would you separate a mixture of sulfur and iron?

11. How would you define a mixture?

12. How would you define a pure substance?