

Separating Liquid Mixtures

Name _____ Date _____ Period ___ Group ___

Problem: To separate a mixture of liquids by boiling, what characteristic property you have previously learned about, must be different about the liquids that are mixed together?

Hypothesis: If _____

Variables: By the time you finish this experiment you will need to identify the different types of variables present in this investigation. Consult your notes for definitions of the types of variables.

Independent Variables: _____

Dependent Variables: _____

Controlled Variables: _____

Procedures:

(Day 1)

A– Have one person in your group obtain about 10 cm³ of your liquid mixture and determine its odor, flammability, and density. The other person in your group will get another 15 cm³ of the mixture and boil it using the apparatus shown in the diagram at right.

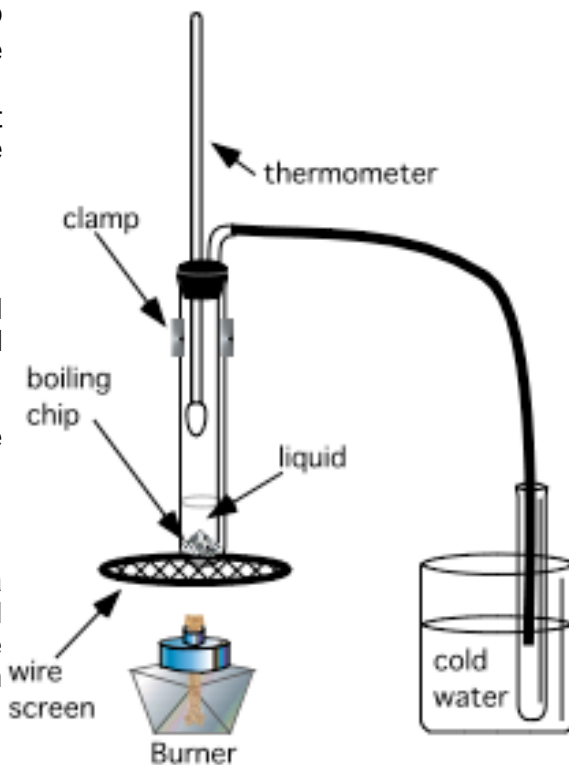
B– Record the temperature every minute until it is almost gone. Check with your teacher to find out if you have heated it long enough.

Safety: Wear safety goggles

Materials: 10 ml graduated cylinder, balance, liquid mixture. See diagram on fourth page for additional equipment needed.

Observations:

Odor: Put a few drops on a clean watch glass and waft the odor to your nose. Describe the odor.



Flammability : Put 5 drops on a watch glass and using a wooden splint that you light over a burner, touch the wood splint to the liquid, and then move the splint away from the liquid. If the liquid is flammable, it will be burning even when the splint isn't in direct contact with the liquid.

Is the liquid flammable? _____

Density : Use the data chart below to collect the data needed to calculate the mixtures density.

Density = Mass ÷ Volume

Liquid	Mass of Empty cylinder in grams (to .01g)	Mass of Liquid and cylinder in grams (to .01g)	Mass of Liquid in grams (to .01g)	Volume of Liquid in ml (cm ³) to 0.1 cm ³	Density of Liquid in g/cm ³ to 0.1 g/cm ³
1					

Time - Temperature Data

Time in Minutes	Temperature to .1 °C	Time in Minutes	Temperature to .1 °C
0		16	
1		17	
2		18	
3		19	
4		20	
5		21	
6		22	
7		23	
8		24	
9		25	
10		26	
11		27	
12		28	
13		29	
14		30	
15		31	

Procedures:

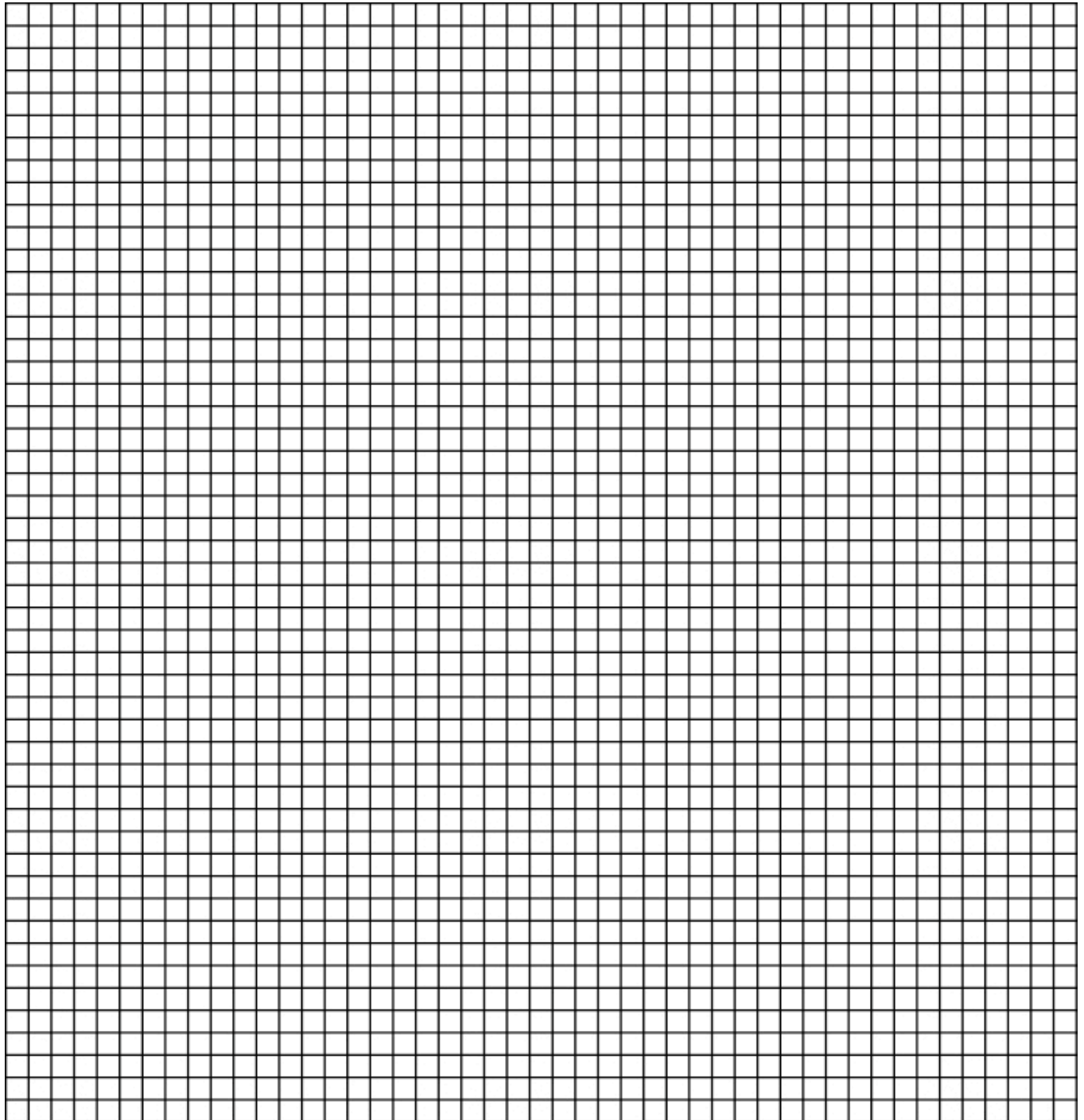
(Day 2) Construct a time and temperature graph using the data collected yesterday.

Question 1. Each flat section, or plateau on your graph, represents a different liquid in your mixture. How many plateaus are on your graph?

Question 2. Each plateau on your graph, represents the boiling point temperature of the liquids in your mixture? List below, those temperatures for the plateaus on your graph?

Question 3. Refer to the table on the last page, and based on the tests you did on the mixture, and the boiling points for the plateaus, tell which liquids were in your mixture. The density of the mixture will be some where between the highest and lowest densities for the liquids that are mixed together.

Title _____



Use pencil ONLY!

