Name: **Lab Partner:**

Part II.

Table 1: Inferred Celsius Temperature From Nichrome Wire Color

Color	No light	Almost Red	Dark Red	Bright Red	Yellow-Red	Almost White	White
Temp.(°C)	< 500	500–550	650–750	850–950	1050–1150	1250–1350	>1450

Table 2: Data/ Observations

Observations	Burner (closed air intake) **Yellow Flame**	Burner (open air intake) **Blue flame with blue inner cone**	
		Bottom of blue flame	Tip of inner blue cone
Wire Color			
Is Soot observed (Yes or No) →			

Table 3: Results (Use Table 1, above, to infer temperature from wire color)

Flame	Burner (closed air intake)	Burner (open air intake) Bottom	Burner (open air intake) Top inner cone
Temperature, °C of nichrome wire			

Conclusion

Write a sentence or two that states what type of flame and position you conclude is the hottest based on your observations of the nichrome wire and its inferred temperature.

Questions

1. Sketch the flame of a properly adjusted Bunsen burner and indicate the hottest position.

2. The primary combustible component of the fuel used in a Bunsen burner is methane gas, CH_4. When completely burned the carbon in methane combines with oxygen to form gaseous carbon dioxide, CO_2. When not completely burned, the carbon in methane does not combine with oxygen. This leaves just pure carbon (glowing yellow because of the heat). On reaching a cool surface, the carbon is deposited as soot or "carbon black." Which of the burner flames that you observed did not completely burn the methane? What observation did you use to infer this?

3. Identify an observation and an inference in the following scenario. A student comes into a classroom carrying books and car keys. A second student sees a Saab car key on the first student's key ring and says: "How do you like your Saab? Is it fun to drive?"

Observation: _____ Inference: _____

Part III. Observing States of Matter

	Solids	**Liquids**	**Gases**
List 3 examples of each state of matter.			
Are these substances fluids (Do they flow)?			
Are these substances compressible?			
Is the shape of these substances fixed or variable?			
Is the volume of these substances fixed or variable?			

Changing States of Mater

	List examples of this change in state.	Is energy added or released during this change?
Solid → Liquid		
Solid → Gas	**Sublimation** **Dry Ice ➔ Carbon Dioxide Gas**	
Liquid → Gas		
Liquid → Solid		
Gas → Liquid		
Gas → Solid	**Deposition** **Formation of Frost**	

Results/Data Interpretation

The state of matter that has the highest energy is _____.

Conclusion

Fill in the blanks for the three states of matter (gas, liquid, solid), in order of lowest energy to highest energy.
The three states of matter are, in order of lowest energy to highest energy:
_____ < _____ < _____

Questions

1. Substance X has very low compressibility, definite volume, and variable shape. What state of matter is it?

2. Models are representations or analogies used to help visualize something that cannot be directly observed. Models are useful because they can provide something for us to picture in our minds as we think about the behavior of things at the microscopic level. The following have been suggested as models for the three states of matter. For each model identify which state of matter it represents.

"Flies in a Jar" = a bunch of flies zooming around in a jar, bouncing off the insides of the jar and each other with no other connections to each other. The flies would fill (get to all parts of) any size jar they are put into and they can be squeezed into a smaller jar.

"Bricks in a Wall" = a wall of interlocked bricks that do not move relative to each other and retain the size and shape of the wall even when forces are applied to the wall.

"Marbles in a Bag" = a flexible bag of marbles in which the marbles can move around each other but are still close together The shape of the bag changes but the volume that the marbles occupy does not change.

Intentionally Blank
(So instructor can keep the safety agrteement)

CEM 101 Lab Safety Agreement.

Copy this agreement into your lab notebook
This should be the only item on page 1 of your lab notebook.
It will serve as a constant reminder that you have promised to comply.

I understand a seat in the laboratory of CEM 101 is contingent upon:

1. **Arriving on time … I acknowledge that the chemistry department policy is to deny seating for late arrivals.**
2. **Having notebook prepared as defined in the lab briefing**
3. **Following all safety rules as defined by the instructor**
4. **Dressing appropriately as defined in the lab briefing**
5. **Not having food or drinks in the lab**
6. **Leaving all electronic devices (except calculators) in the storage area.**
7. **Turning off all cell-phones**
8. **Never returning reagents to original bottles**
9. **Wearing safety goggles/glasses when advised to do so by the instructor**
10. **Never returning reagents to bottles**
11. **When lab is done cleaning up, putting everything away, and wiping down the lab bench**

_____ _____

Print Name **Signature**

Date Signed: _____