Name: _____ Period: _____ Date: _____

Laboratory Procedures Laboratory Activity – Teacher Edition

Exploring the Bunsen Burner

Background Information:

A Bunsen burner is a kind of gas burner used as laboratory equipment. This burner named after Robert Bunsen produces a single open gas flame that is very stable and is used for various laboratory processes such as heating chemicals, causing chemical reactions, sterilizing tools, and starting combustion. It uses a gas which can be natural gas or a liquefied petroleum gas such as propane, butane, or a mixture.

Match Lighting Gas by Vanessa Voltz is licensed under CC 4.0 via Wikimedia Commons.

The Bunsen burner consists of a metal tube on a based with a gas inlet at the lower end of the tube which may have an adjusting valve. It has openings in the sides of the tube which can be regulated by a collar to allow as much air as desired. The mixture of air and gas is forced by gas pressure to the top of the barrel, where it is ignited with a match or flame striker. A Bunsen burner burns with a pale blue flame when the remaining gas is completely oxidized by the surrounding air. In this activity, you will be able to manipulate a Bunsen burner and get to know the different parts that make it work. Once you are familiar with the different parts of a Bunsen burner, you will then practice how to light it as well as set up yellow and blue Bunsen flame.

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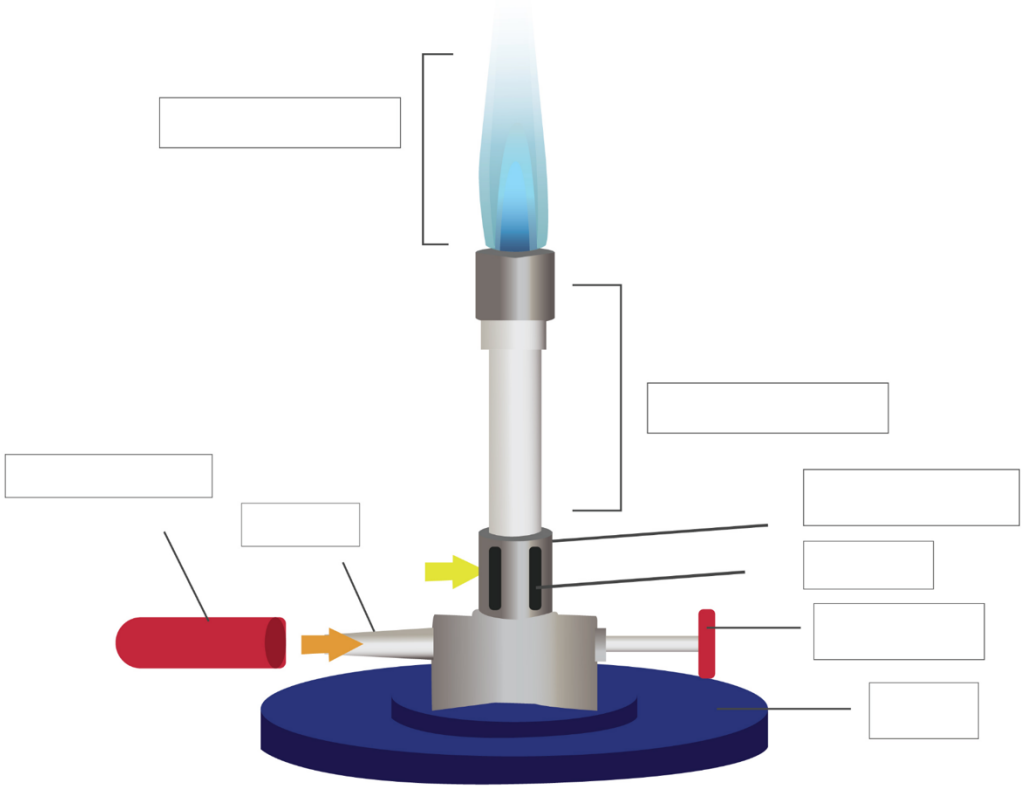
Learning Objectives:

At the end of this laboratory activity, students are expected to:

- Identify the major parts of a Bunsen burner.
- Follow the correct procedure to light a Bunsen burner.
- Set up blue and yellow Bunsen flame.

Pre-lab Questions:

1. Label the parts of the Bunsen burner.



2. Describe the function of each part.
   a. Barrel

_____

_____

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b. Gas valve

_____

_____

c. Collar

_____

_____

d. Gas inlet

_____

_____

e. Base

_____

_____

Laboratory Proper:

Materials:

- Bunsen burner
- heat-proof mat
- flame striker

Safety Alert! *Always wear your safety googles while doing this activity. If you have long hair, tie it back. Do not wear loose long sleeves. Most importantly, follow the instructions of the teacher. Do not do anything unless you are told to do so.*

Procedure:

1. Get a Bunsen burner for your group. Examine its parts. Make sure not to touch the gas tap while you are examining the Bunsen burner.
2. Briefly discuss with your groupmates the different parts of the Bunsen burner and describe each.

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3. Watch your teacher's demonstration on how to light a Bunsen burner. Observe carefully how he/she operates the Bunsen burner.
4. Together with your groupmates, review the steps in lighting a Bunsen burner.
   a. Clear off the lab table. Remove all flammable and combustible materials from the work area.
   b. Connect rubber tubing to the lab burner and gas valve. Check for holes or cracks in the tubing.
   c. Close or partially close the air vents on the burner to make it easier to light.
   d. Get a striker (flint lighter).
   e. Turn on the gas.
   f. Bring the flint lighter alongside the barrel of the burner and raise it slowly over the edge of the barrel from the side. Hold it slightly off center of the barrel of the burner and a few inches above the tip.
   g. Strike the flint lighter to create a spark over the gas coming out of the burner.
   h. A lit Bunsen burner with closed or partially closed air vents gives a yellow safety flame. The soft yellow flame should never be used to heat anything, but it is easier to light and observe this flame.
   i. Adjust the air supply by turning the metal collar to get the tight, bright, blue, cone-shaped flame.
   j. Once the Bunsen burner is lit, never leave it unattended.
5. Once you are familiar with the steps in lighting a Bunsen burner, take turns in lighting the Bunsen burner assigned to your group. For every turn, set up yellow and blue flame.

Post-lab Questions:

1. Why should you clear off the lab table before lighting the Bunsen burner?

   _____

   _____

2. What do you think will happen if the air events on the burner are widely opened?

   _____

   _____

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3. Why should you put the flint lighter slightly off center the barrel before striking it?

_____

_____

4. How can you set up a Bunsen blue flame?

_____

_____

5. What is the role of the collar in setting up Bunsen yellow or blue flame?

_____

_____

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Answers:

Exploring the Bunsen Burner

Background Information:

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The Bunsen burner consists of a metal tube on a based with a gas inlet at the lower end of the tube which may have an adjusting valve. It has openings in the sides of the tube which can be regulated by a collar to allow as much air as desired. The mixture of air and gas is forced by gas pressure to the top of the barrel, where it is ignited with a match or flame striker. A Bunsen burner burns with a pale blue flame when the remaining gas is completely oxidized by the surrounding air. In this activity, you will be able to manipulate a Bunsen burner and get to know the different parts that make it work. Once you are familiar with the different parts of a Bunsen burner, you will then practice how to light it as well as set up yellow and blue Bunsen flame.

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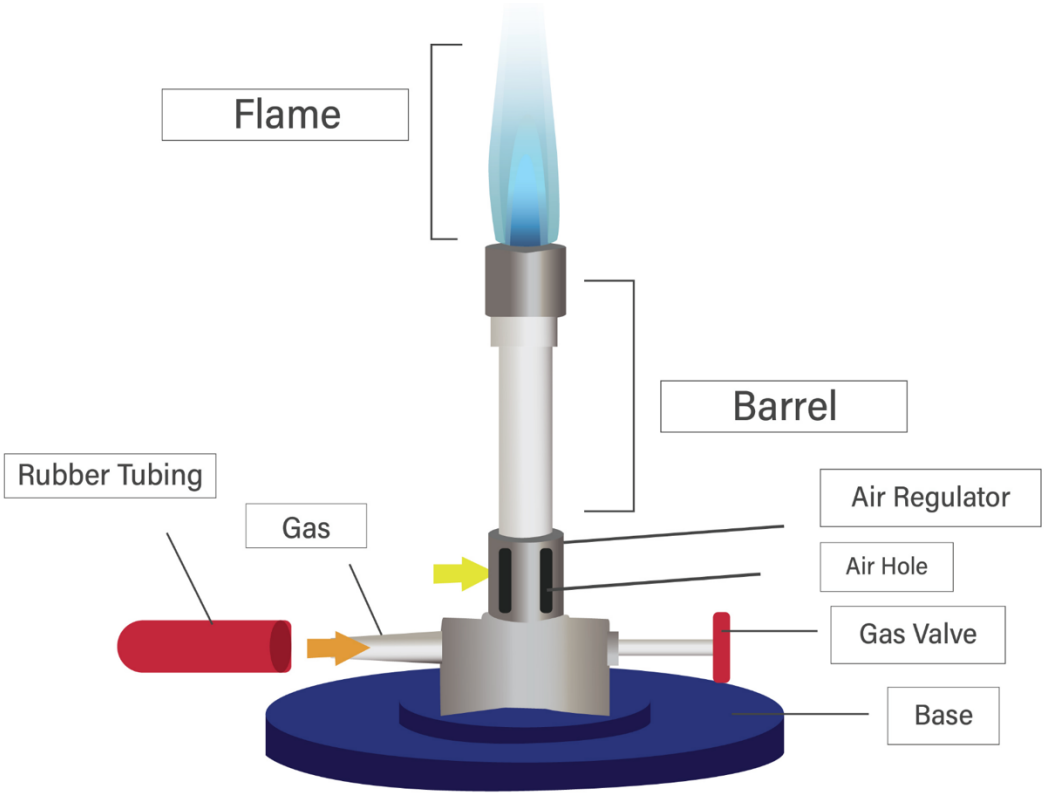
Learning Objectives:

At the end of this laboratory activity, students are expected to:

- Identify the major parts of a Bunsen burner.
- Follow the correct procedure to light a Bunsen burner.
- Set up blue and yellow Bunsen flame.

Pre-lab Questions:

1. Label the parts of the Bunsen burner.



2. Describe the function of each part.
   a. Barrel

      It is the long tube where the air and gas mix for combustion to take place.

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b. Gas valve

It controls the amount of gas that enters the burner.

c. Collar

It is a small disk at the bottom of the barrel which regulates the amount of air that enters the barrel.

d. Gas inlet

This is where the rubber tubing is connected for the gas supply to enter the barrel.

e. Base

It provides support to the burner.

Laboratory Proper:

Materials:

- Bunsen burner
- heat-proof mat
- flame striker

Safety Alert! *Always wear your safety googles while doing this activity. If you have long hair, tie it back. Do not wear loose long sleeves. Most importantly, follow the instructions of the teacher. Do not do anything unless you are told to do so.*

Teacher's Preparation: *Divide the class into small groups. Provide each group with a working Bunsen burner. Check ahead of time any leaks on the rubber tubing of each Bunsen burner. Go through the laboratory safety rules particularly those that are related to heating with the class through questioning.*

Procedure:

1. Get a Bunsen burner for your group. Examine its parts. Make sure not to touch the gas tap while you are examining the Bunsen burner.
2. Briefly discuss with your groupmates the different parts of the Bunsen burner and describe each.

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3. Watch your teacher's demonstration on how to light a Bunsen burner. Observe carefully how he/she operates the Bunsen burner. *Describe aloud the steps while lighting the Bunsen burner. Call volunteer students to try to light the Bunsen burner, but with teacher's guidance.*
4. Together with your groupmates, review the steps in lighting a Bunsen burner.
   a. Clear off the lab table. Remove all flammable and combustible materials from the work area.
   b. Connect rubber tubing to the lab burner and gas valve. Check for holes or cracks in the tubing.
   c. Close or partially close the air vents on the burner to make it easier to light.
   d. Get a striker (flint lighter).
   e. Turn on the gas.
   f. Bring the flint lighter alongside the barrel of the burner and raise it slowly over the edge of the barrel from the side. Hold it slightly off center of the barrel of the burner and a few inches above the tip.
   g. Strike the flint lighter to create a spark over the gas coming out of the burner.
   h. A lit Bunsen burner with closed or partially closed air vents gives a yellow safety flame. The soft yellow flame should never be used to heat anything, but it is easier to light and observe this flame.
   i. Adjust the air supply by turning the metal collar to get the tight, bright, blue, cone-shaped flame.
   j. Once the Bunsen burner is lit, never leave it unattended.
5. Once you are familiar with the steps in lighting a Bunsen burner, take turns in lighting the Bunsen burner assigned to your group. For every turn, set up yellow and blue flame.

Post-lab Questions:

1. Why should you clear off the lab table before lighting the Bunsen burner?
   It is important to clear off the table before lighting the Bunsen burner as some materials, especially those that are flammable, may catch flame and cause accidents.

2. What do you think will happen if the air events on the burner are widely opened?
   If the air vents on the burner are widely open, the flame will be too high / big.

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3. Why should you put the flint lighter slightly off center the barrel before striking it?

   Putting the flint lighter directly at the center of the barrel will cause a surge of flame when you strike it.

4. How can you set up a Bunsen blue flame?

   By slowly rotating the collar or air regulator until a blue flame is achieved.

5. What is the role of the collar in setting up Bunsen yellow or blue flame?

   The collar regulates the amount of air (oxygen) that enters the barrel, which is essential in combustion.

   Incomplete combustion usually results in yellow flame while complete combustion produces blue flame.

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