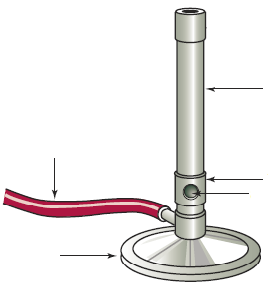
The Bunsen Burner

**The Bunsen burner is a useful piece of laboratory equipment, but it can also be very dangerous. Your safety depends on using it correctly.**

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Label the barrel, collar, base, air hole and gas inlet on the diagram.

What is the purpose of the air hole?

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the function of the collar?

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the function of the barrel?

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Why do you need to use a heatproof mat under the Bunsen burner?

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**What are some safety rules for using a Bunsen burner?**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**When using a Bunsen burner, you should follow these steps.**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Activity: Investigating the Bunsen burner flame.

**Equipment:** Bunsen burner Heat proof mat Safety glasses Matches

Test tube rack Test tube holder Test tubes x2

**Procedure:**

1. Collect all your equipment and take it to your bench.
2. Light the Bunsen burner, following the correct procedure.
3. With the collar closed, draw the flame and describe its colour.
4. Turn the collar to open the air hole. Draw the flame and describe its colour now.
5. Which flame (air hole open or closed) is more visible? This is called the luminous flame. The less visible flame is called the non-luminous flame.
6. Which flame (air hole open or closed) is steady and which flame is wavy?
7. Which flame (air hole open or closed) is noisy and which is quiet?
8. Carefully bring the back of your hand close to the side of each flame. Which flame is the hottest and which is the coolest?
9. Close the air hole. Using the test tube holder, hold a clean test tube in the flame for 20 seconds. Describe what happens to the test tube. Open the air hole and repeat the procedure with a new test tube.
10. When you have finished, close the air hole of your Bunsen burner, then turn the gas off. Leave your equipment to cool, and then pack it away.

|  |  |  |
| --- | --- | --- |
|  | **Flame with air hole closed** | **Flame with air hole open** |
| **Draw the flame** |  |  |
| **Describe the flame colour** |  |  |
| **Luminous/Non-luminous** |  |  |
| **Wavy/Steady** |  |  |
| **Noisy/Quiet** |  |  |
| **Hottest/Coolest** |  |  |
| **Heating test tube in the flame** |  |  |

**Questions**

The luminous flame is also called the dirty flame. From your observations, why do you think it is given this name?

Which is the safer flame to use if you need to leave your Bunsen burner alight? Give two reasons for your choice.

**Complete the following exercises.**

|  |  |
| --- | --- |
|  | Disconnect the Bunsen burner from the gas tap. |
|  | Close the air holes by turning the collar. |
|  | Light a match and hold it at the top of the burner. |
|  | Turn the collar to open the air holes to heat with a non-luminous flame. |
|  | Place heatproof mat under the Bunsen burner. |
|  | Turn on the gas and light the burner. |
|  | Connect the inlet tube to the gas tap. |
|  | Turn off the gas tap. |
|  | Close the air holes when you have finished heating. |

1. The following list gives the steps you should follow when lighting a Bunsen burner. Number them in the correct order, from 1 to 9.
2. In the following paragraph, cross out the words which are incorrect.

When a Bunsen burner is first lit, the air hole should be **open / closed**. This produces a **luminous / non-luminous** flame, which **can / cannot** be easily seen. When the Bunsen burner is not being used, it **should / should not** be left with this flame burning. If a clean piece of glass, like a test tube, was heated in this flame it **would / would not** go black. When the air hole is opened, air mixes with the gas and this causes the gas to burn **completely / incompletely**. A **luminous / non-luminous** flame is produced, which is   
**dirty / clean** and **hot / cool**. This flame **should / should not** be used for heating glass ware.

1. Write the correct name (luminous or non-luminous) for the flame of a Bunsen burner when the:
   1. Flame is yellow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Flame is blue \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Flame is used to heat glass \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Flame is hottest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. Flame is coolest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. Flame is safest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   7. Flame is cleanest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   8. Flame is noisiest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   9. Air hole is closed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   10. Air hole is open \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_