Boiling Water **Results Table**

Time (seconds)	Temperature (°C)

Boiling Water **Results Table**

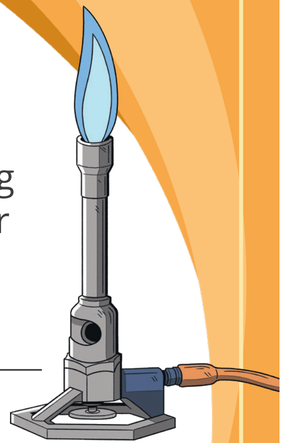
Time (seconds)	Temperature (°C)

Bunsen Burner Licence

____

has completed the Bunsen burner training course and is able to use a Bunsen burner safely in a laboratory. **Well Done!**

Signed ______________________ Dated __________



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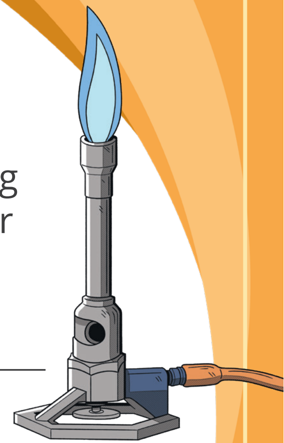

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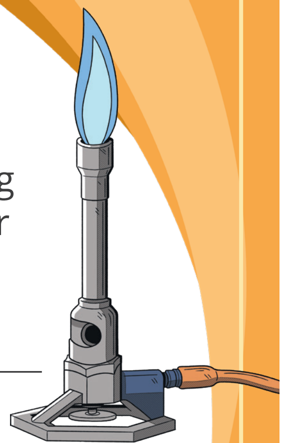

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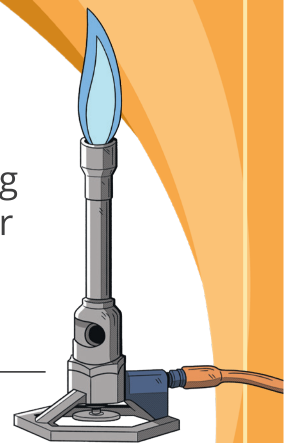

Bunsen Burner **Bingo**

Bunsen Burner **Bingo**

Bunsen Burner **Bingo**

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Bunsen Burner **Bingo**

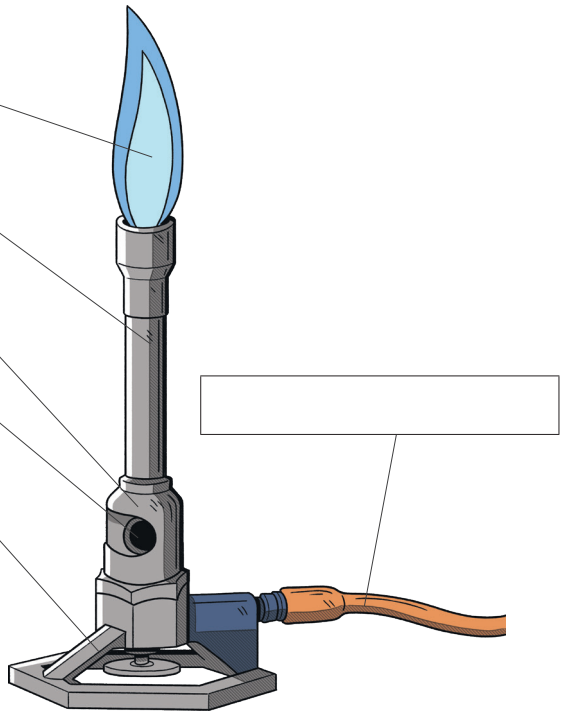
Bunsen Burner **Bingo**

The Bunsen Burner

Label the Bunsen burner using the key words.

Key words

a) collar
b) tubing
c) air hole
d) roaring flame
e) chimney
f) base



What does the air hole do?

What colour is the safety flame?

Why is it called the safety flame?

The Bunsen Burner

Label the Bunsen burner using the key words.

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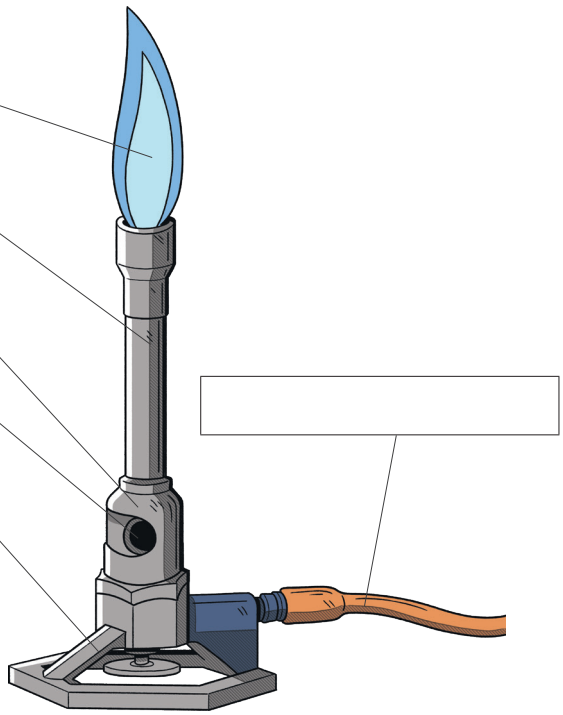

What does the air hole do?

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Why is it called the safety flame?

The Bunsen Burner **Answers**

Key words

a) collar
b) tubing
c) air hole
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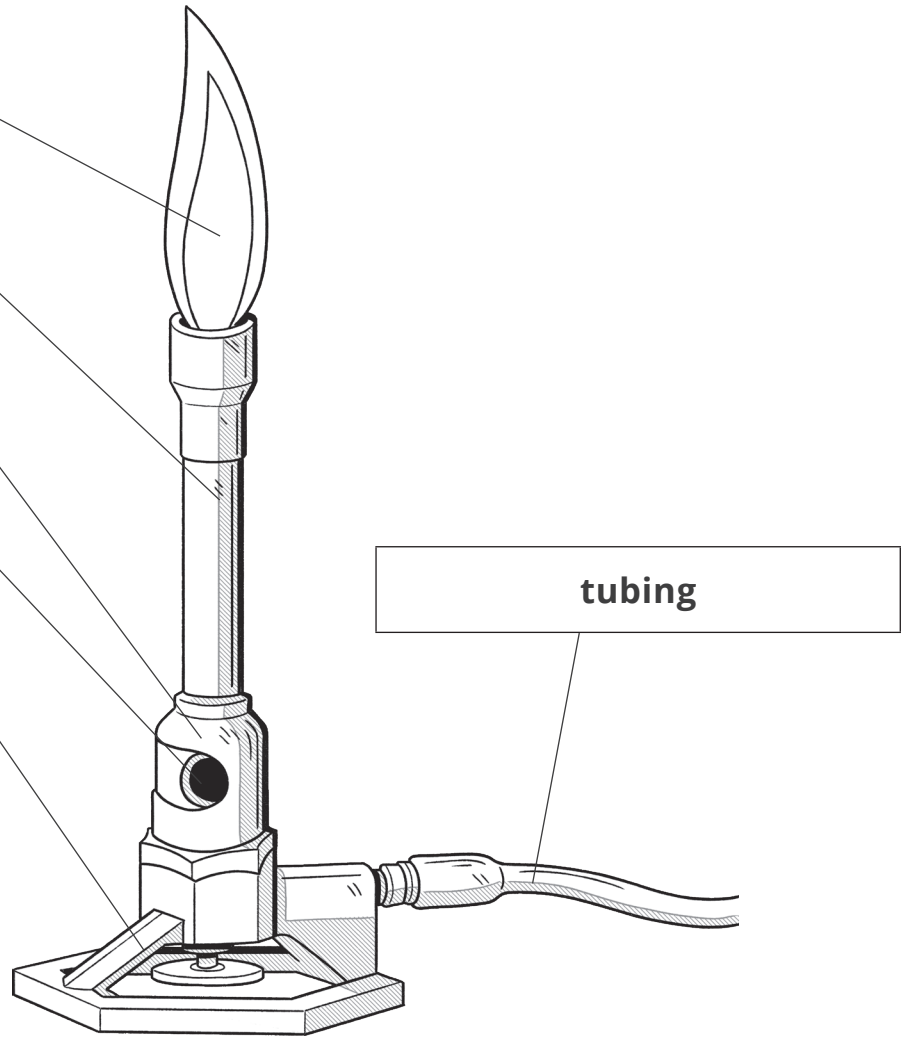
f) base



What does the air hole do?

When the air hole is open, more oxygen enters the Bunsen burner, making a roaring flame. If the air hole is closed less oxygen will enter the Bunsen burner, making a safety flame.

What colour is the safety flame?

yellow

Why is it called the safety flame?

Because you can see the flame more easily when the Bunsen burner is not in use.

The Bunsen Burner

Label the Bunsen burner using the key words.

Key words

a) collar
b) tubing
c) air hole
d) roaring flame
e) chimney
f) base

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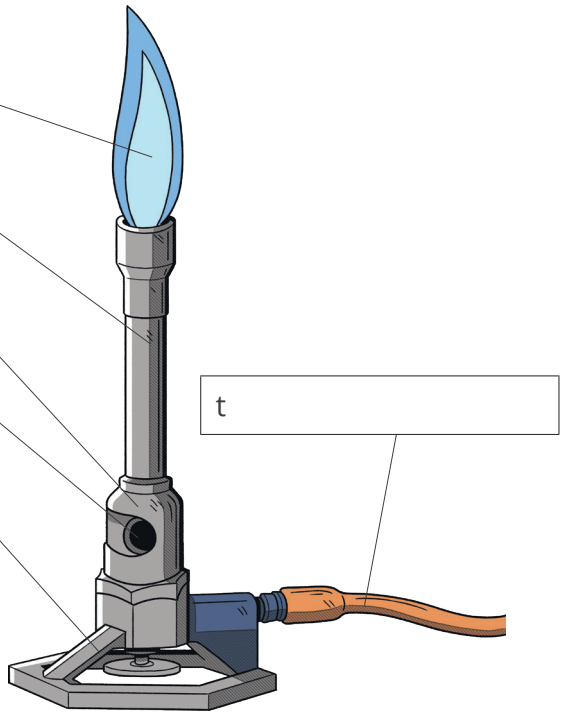

What does the air hole do?

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What colour is the safety flame?

_____

Why is it called the safety flame?

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The Bunsen Burner

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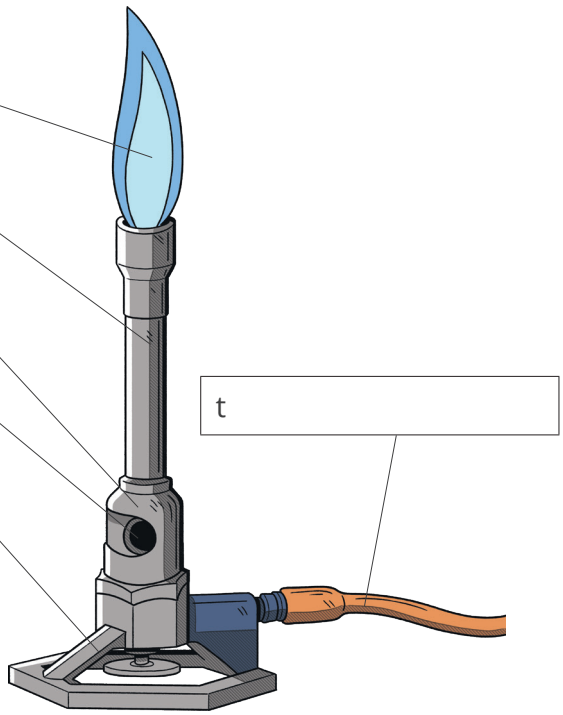

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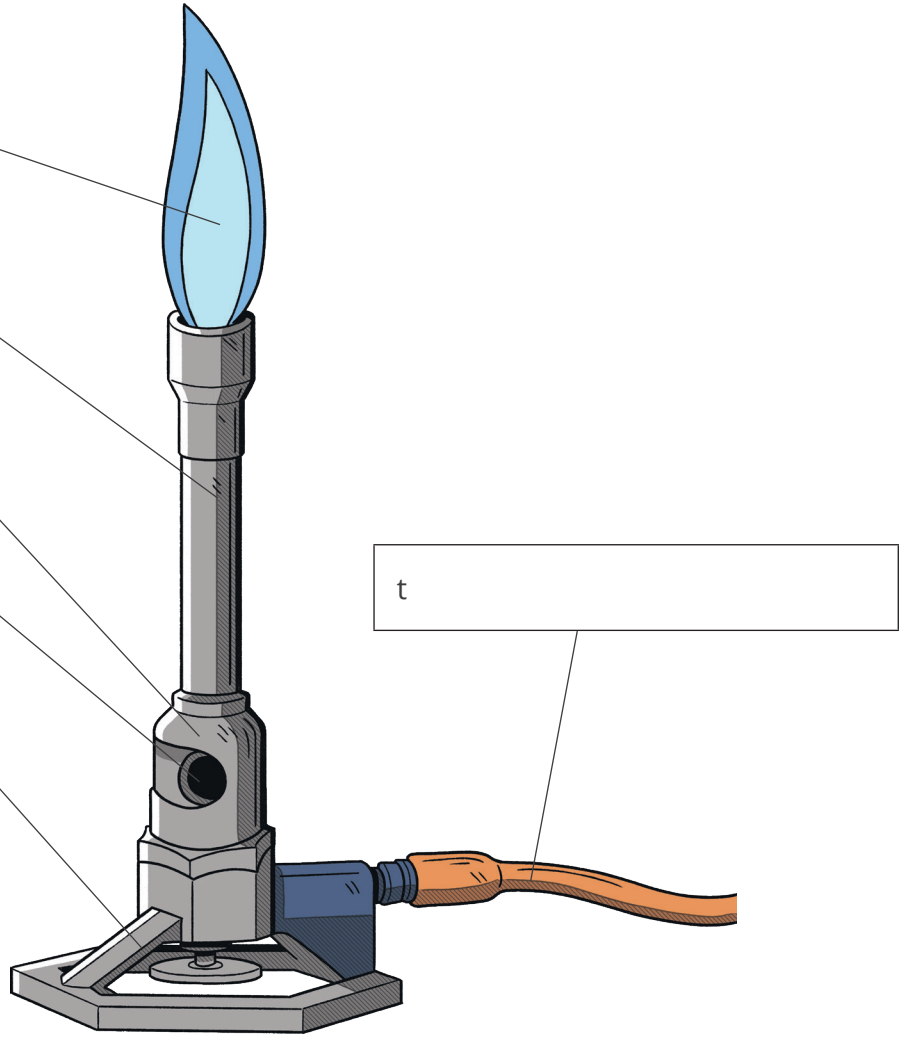

What does the air hole do?

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What colour is the safety flame?

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Why is it called the safety flame?

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The Bunsen Burner

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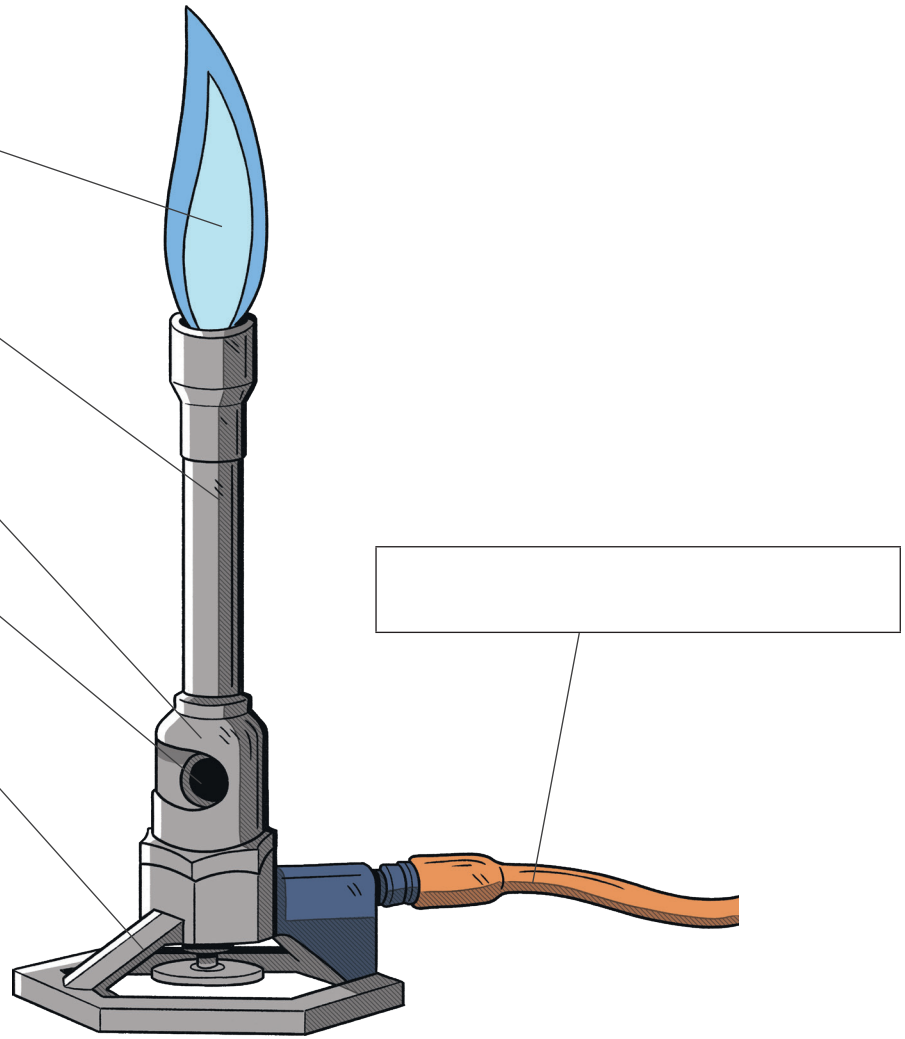
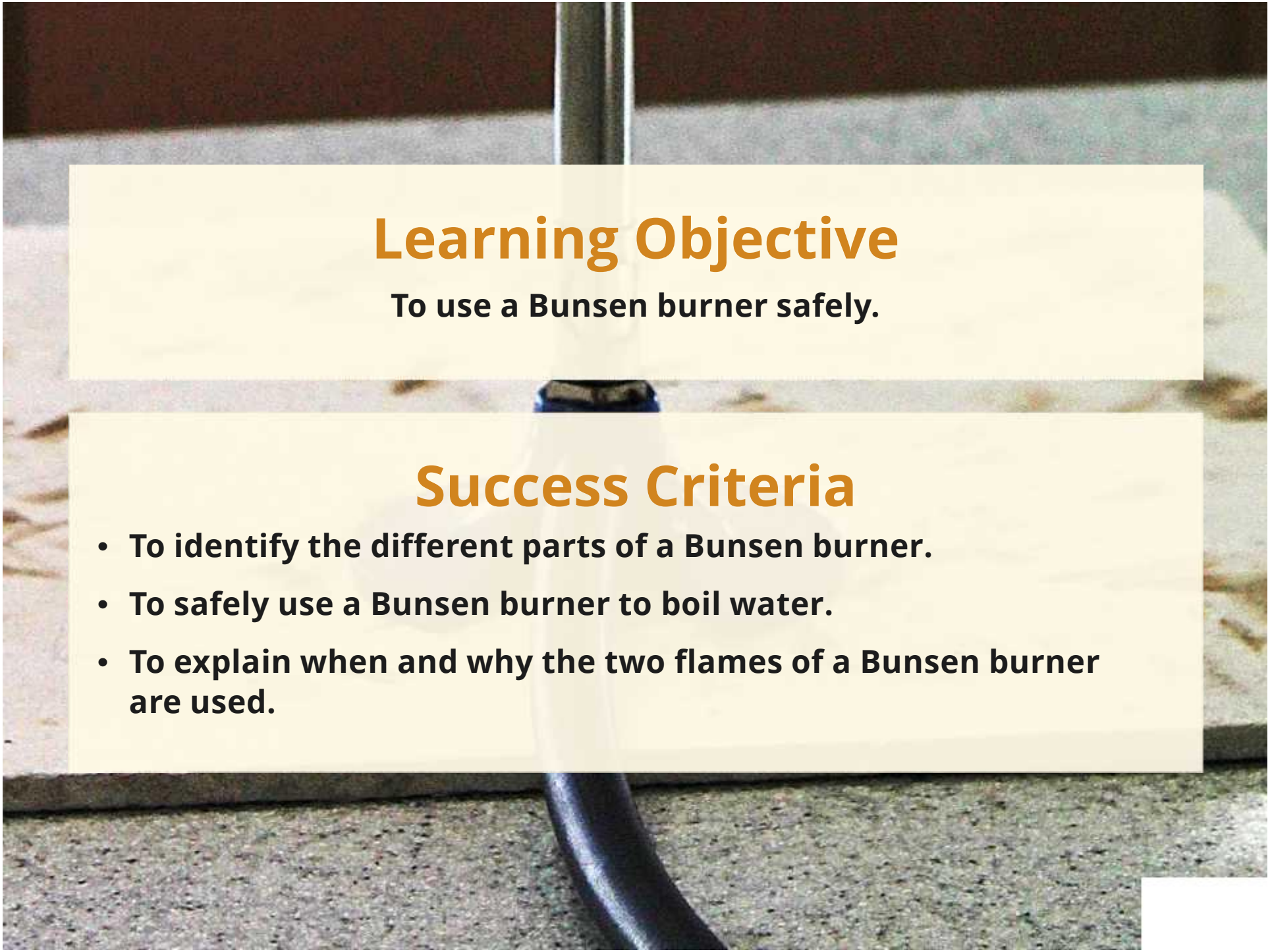


What does the air hole do?

What colour is the safety flame?

Why is it called the safety flame?

Using a Bunsen Burner



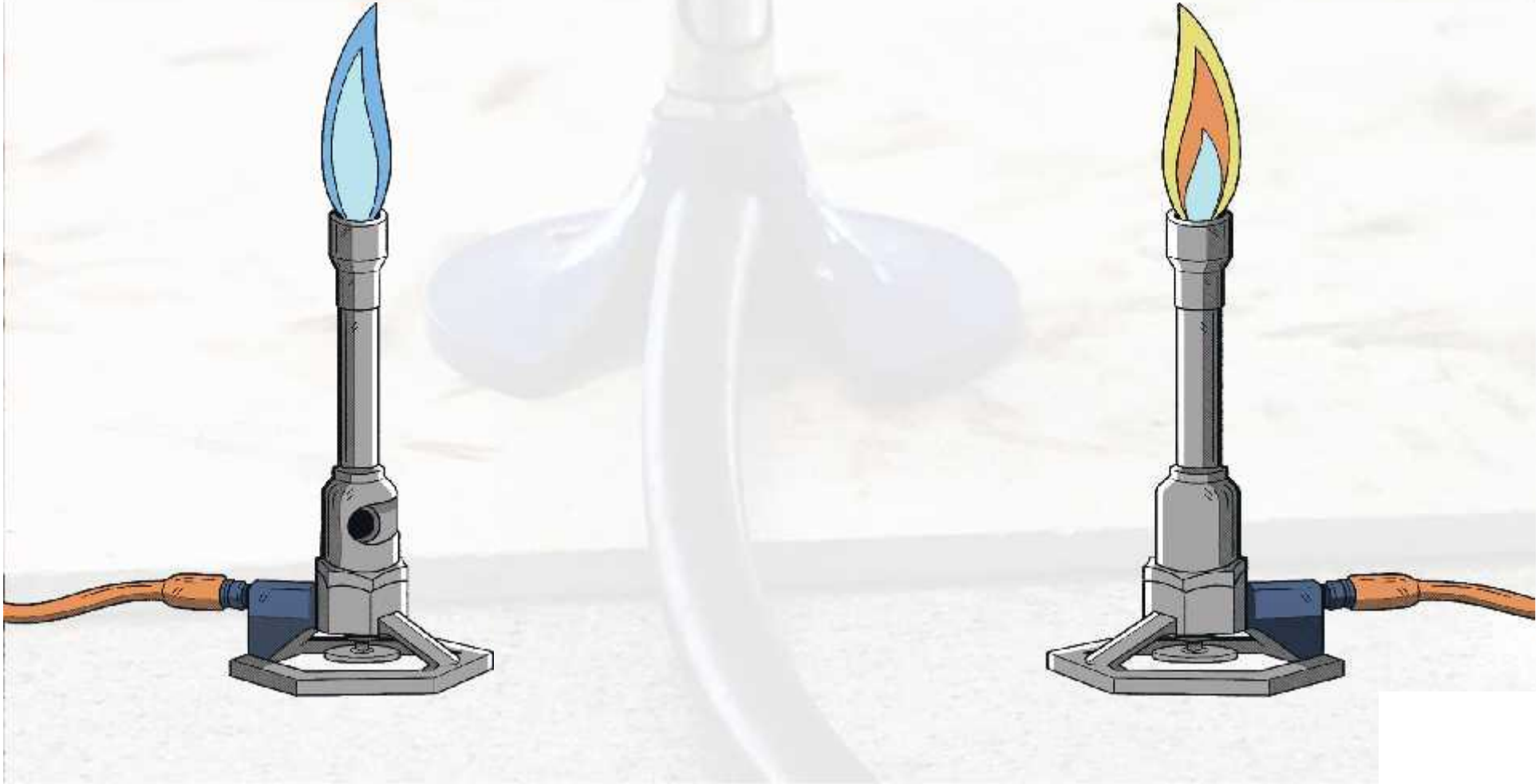
Learning Objective

To use a Bunsen burner safely.

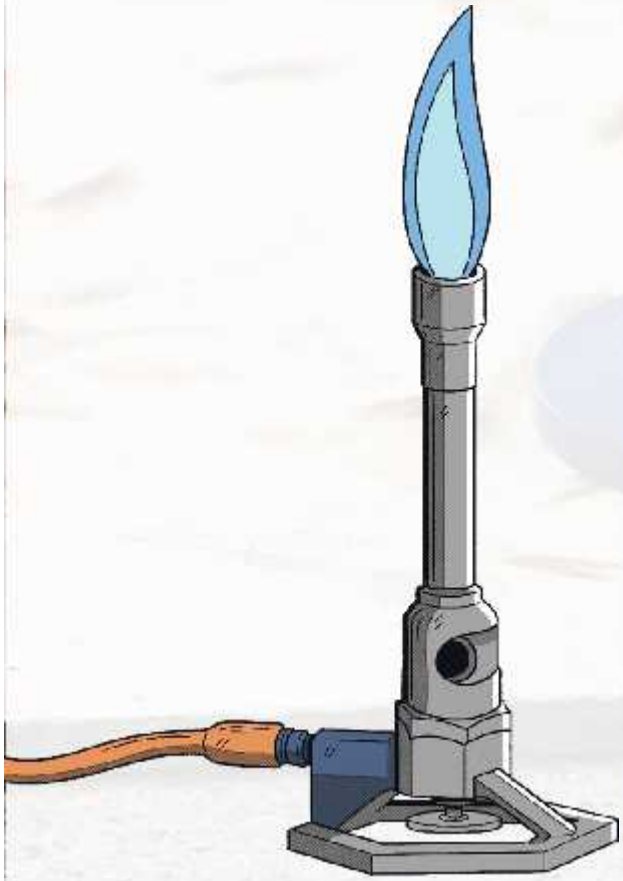
Success Criteria

- **To identify the different parts of a Bunsen burner.**
- **To safely use a Bunsen burner to boil water.**
- **To explain when and why the two flames of a Bunsen burner are used.**

What Are the Differences between the Two Pictures?



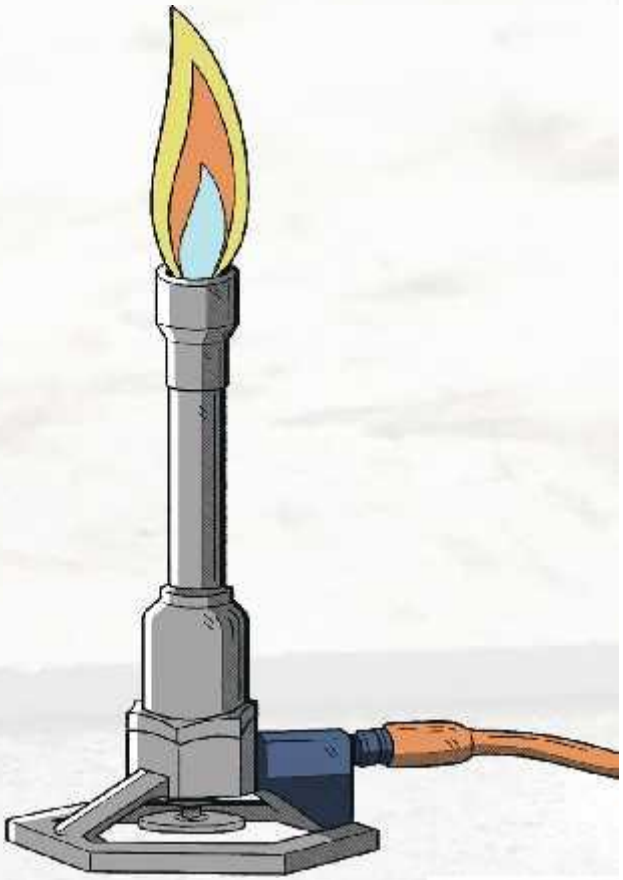
What Are the Differences between the Two Pictures?



One has a blue flame the other has a yellow flame.

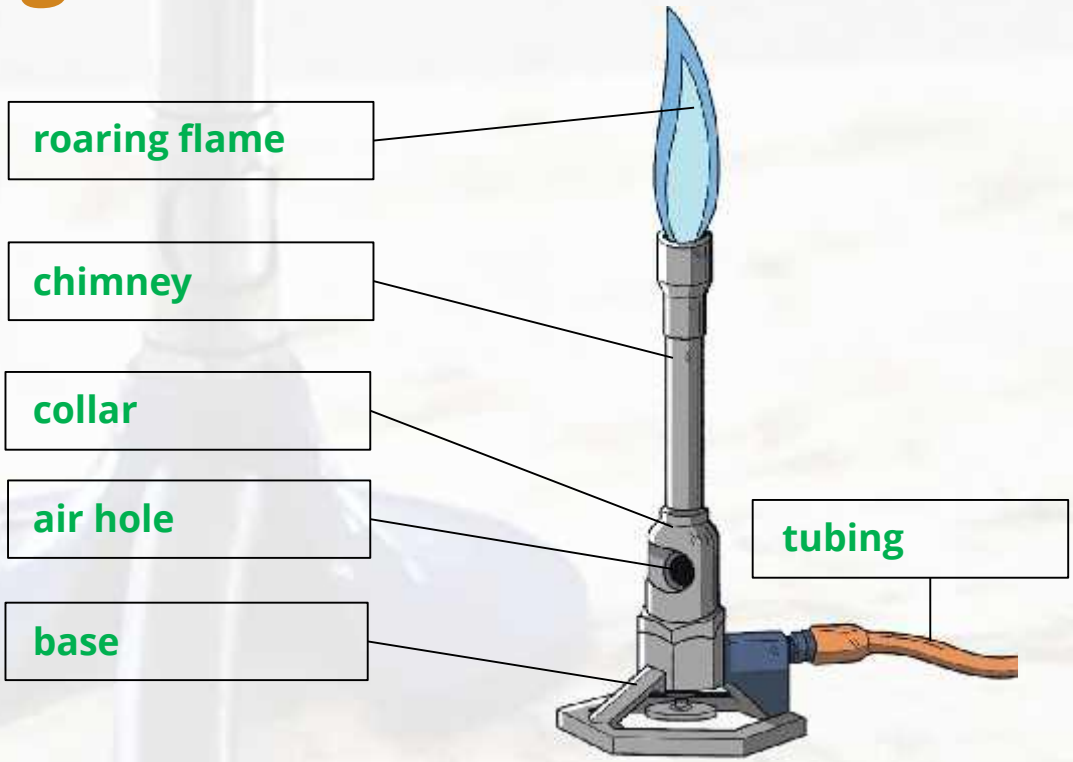
One has an open hole near the bottom and the other does not.

Now carefully watch the demonstration of the correct use of a Bunsen burner.



Label the Diagram of a Bunsen Burner

Key words
- collar
- tubing
- air hole
- roaring flame
- yellow flame
- chimney
- base



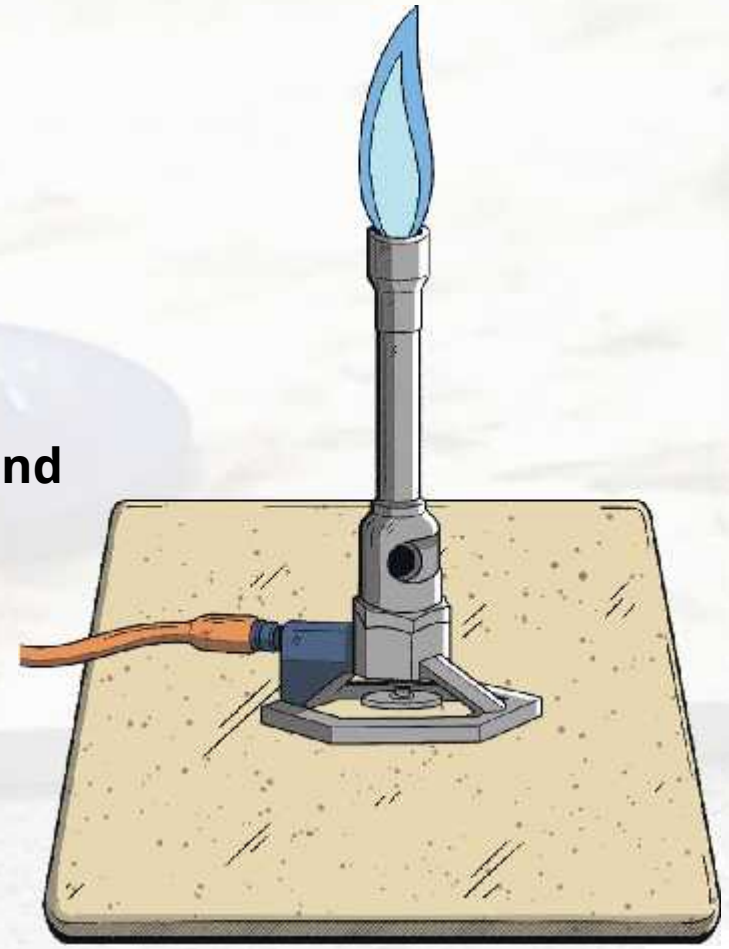
Extension

1. What does the air hole do?
   When the air hole is open more oxygen enters the Bunsen burner, making a roaring flame. If the air hole is closed less oxygen will enter the Bunsen burner, making a safety flame.
2. What colour is the safety flame?
   yellow
3. Why is it called the safety flame?
   Because you can see the flame more easily when the Bunsen burner is not in use.

Using a Bunsen Burner

What safety precautions do we need to put in place when we use a Bunsen burner?

- stand up
- wear eye protection
- tie hair back
- put bags away
- tuck ties in



Soon, you will collect a Bunsen burner and a heatproof mat.

Why do we need a heatproof mat?

To prevent the Bunsen burner from burning the desk.

Using a Bunsen Burner

1. Place the heatproof mat underneath the Bunsen burner.
2. Attach your Bunsen burner to a gas tap. (Do not turn the gas tap on.)
3. Make sure the air hole is closed by turning the collar.
4. When your teacher has checked that your Bunsen burner is set up correctly it may be lit.
5. Very carefully only holding the collar and the tubing, turn the collar to open and close the air hole.
6. Observe the colour and the sound of the flame when the air hole is open, half open and closed. Record your observations.

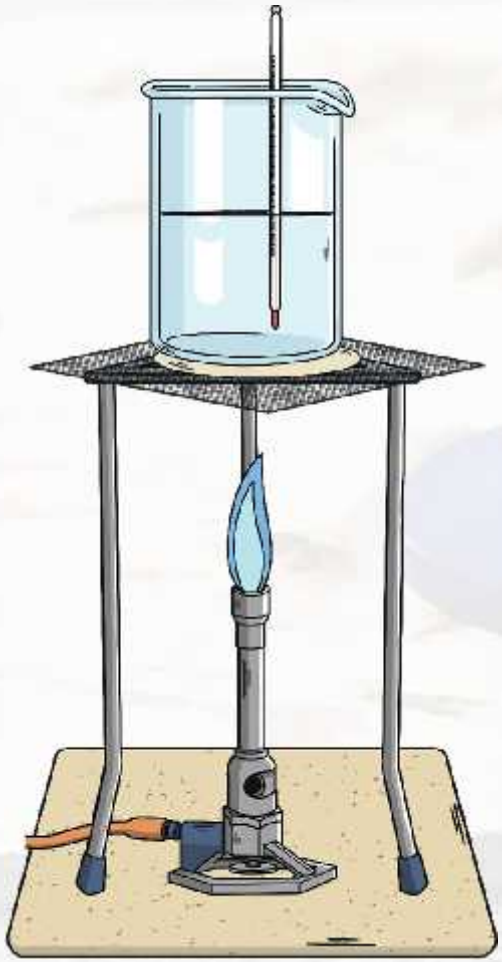
Important!

You must wear eye protection at all times.

Using a Bunsen Burner Observations

	Colour of the Flame	Sound of the Flame	When Is It used?	Amount of Oxygen
Air Hole Open	blue	noisy /roaring	to heat things quickly	lots
Air Hole Half Open	blue	quite noisy	to heat things slowly	a little
Air Hole Fully Closed	yellow	quiet	for safety, when the Bunsen burner is not in use	very little

Using a Bunsen Burner to Boil Water



Set up your equipment as shown.

Equipment list:

- **Bunsen burner**
- **tripod**
- **gauze**
- **heatproof mat**
- **beaker**
- **thermometer**
- **timer**

1. **Measure the starting temperature of the water.**
2. **Light your Bunsen burner and start a timer.**
3. **Record the temperature of the water every 30 seconds.**

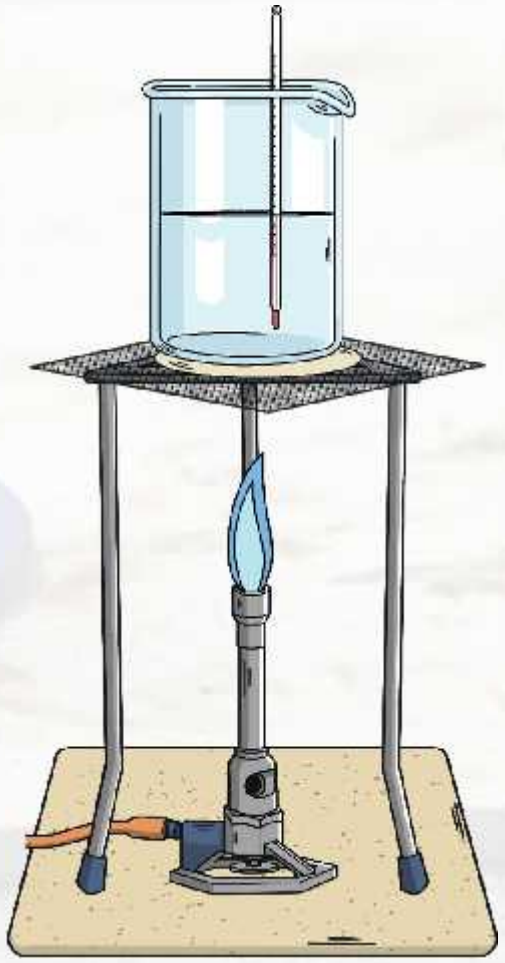
How will you know when the water is boiling?

The water will start to bubble and reach 100°C.

Record your results in a table.

Boiling Water Results Table

Time (seconds)	Temperature (℃)
0	
30	
60	
90	
120	
150	
180	
210	



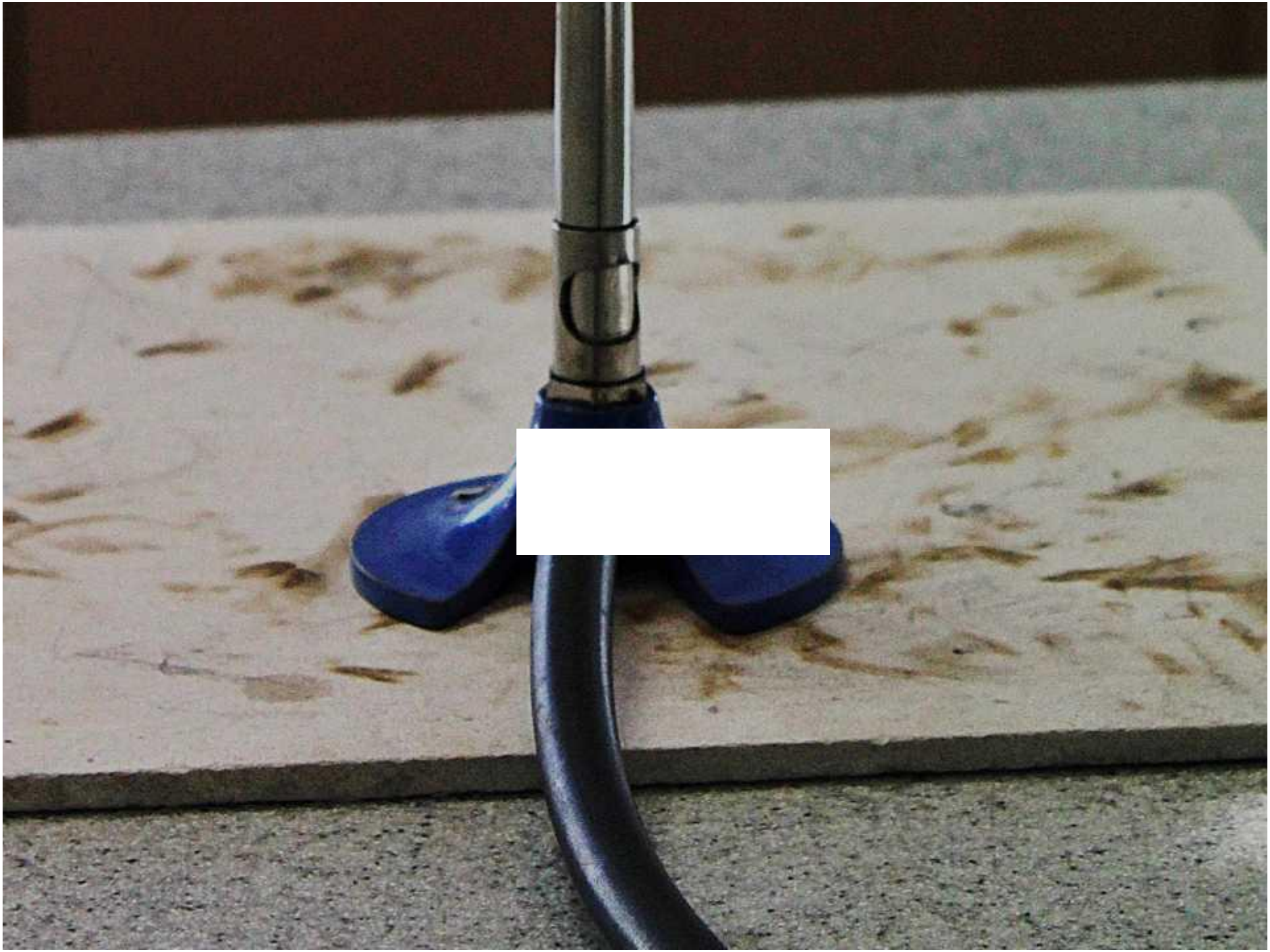
Important!

Turn off your Bunsen burner as soon as the water reaches 100℃.

Key Word Bingo

- Bunsen burner
- flame
- roaring flame
- safety flame
- collar
- base
- oxygen
- air hole
- yellow
- blue
- tubing
- gas tap

Add one word to each box.



Using a Bunsen Burner
Teaching Ideas

Learning Objective:
To use a Bunsen burner safely.

Success Criteria:

- To identify the different parts of a Bunsen burner.
- To safely use a Bunsen burner to boil water.
- To explain when and why the two flames of a Bunsen burner are used.

Context
This lesson is part of the Introduction to Science unit of work for year 7. This lesson follows on from the Health and Safety and Laboratory and Equipment lessons.

Resources (per group)
Bunsen burners, heatproof mat, beaker, timer, thermometer, tripod, gauze, water

Starter

What Are the Differences between the Two Pictures?

Ask students to describe the differences between the two Bunsen burners on the PowerPoint. They can work in pairs or independently. Go through the answers as a class.

Introduce the students to the different parts of the Bunsen burner. Demonstrate how to light the Bunsen burner and how to change the flame between roaring flame and safety flame by turning the collar.

Main Activities

Label the Diagram of a Bunsen Burner

From your demonstration, can the students independently label the diagram of a Bunsen burner? The students can copy the diagram and questions into their books; alternatively, the differentiated **Labelling the Bunsen Burner** worksheets are available to support students.

Go through the answers using the PowerPoint. You may wish for the students to peer-assess each other's work.

Using a Bunsen Burner

Whilst setting up the practical activity, make sure that students are following correct laboratory procedures and rules. Students will light their Bunsen burners, following your instructions and the demonstration you have given them. Students should then observe the colour and sound of the Bunsen burner flame as they adjust the position of the collar to have the air hole open, air hole half open and air hole closed. Pupils can record their observations on the **Using a Bunsen Burner** worksheet.

Using a Bunsen Burner to Boil Water

Students set up a Bunsen burner, tripod, gauze and heatproof mat. Students should half-fill a beaker of water and record the starting temperature. They should then light their Bunsen burner and start a timer. They could record the temperature every 30 seconds in a table of their own design or using the **Boiling Water Results Table** provided in this lesson pack.

Before beginning the practical, discuss with students how they will know when the water has started to boil.

Remind students of the safety precautions necessary when using Bunsen burners and hot liquids. Ensure that time is allowed for equipment to cool before putting the equipment away.

Plenary

Key word Bingo

Using the **Key Word Bingo Template**, or asking students to draw their own grid in their books, the students choose and write down six key words into their bingo grid. Read the words from the PowerPoint slide in a random order or for a more challenging task you could give a description or definition of the word. If students have chosen the word you say or describe they should tick it in their grid and call "Bingo!" when they have ticked all six key words.

At the end of the lesson, provided that the students have acted safely and responsibly with their Bunsen burner, award them with their **Bunsen Burner Licence** certificates.

Disclaimer

We hope you find the information on our website and resources useful. The activities set out in this resource are potentially hazardous. The activities are not suitable for all children and adult supervision may be required for some of the activities. It is your responsibility to assess whether the children in your care are able to safely carry out the activities and whether the children require adult supervision. You are responsible for carrying out proper risk assessments on the activities and for ensuring that activities can be carried out safely. We are not responsible for the health and safety of your group or environment so, insofar as it is possible under the law, we cannot accept liability for any loss suffered by anyone undertaking the activity or activities referred to or described in this resource. It is also your responsibility to ensure that those participating in the activity are fit enough to do so and that you or the organisation you are organising for has the relevant insurance to carry out the physical activity. If you are unsure in any way, we recommend that you take guidance from a suitably qualified professional.

Using a Bunsen Burner **Answers**

	Colour of the Flame	Sound of the Flame	When Is It Used?	Amount of Oxygen
Air Hole Open	blue	noisy/roaring	to heat things quickly	lots
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Using a Bunsen Burner

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