

## Chemicals and Hazards Table

Complete the table with the name of each chemical and its hazard symbol. You could either draw the hazard symbol or give its meaning.

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<b>Chemical</b>	<b>Hazard Symbol</b>

# Hazards in the Home

Find five products around the house that have chemical hazard symbols on them. Write down the name of the product, the hazard symbol(s) on the product and explain why the product may have these symbols.

Product	Symbol(s)	Explanation

Did you find any hazard symbols that you did not see in the laboratory?

What do they mean?

# Hazards in the Home

Find five products around the house that have chemical hazard symbols on them. Write down the name of the product, the hazard symbol(s) on the product and explain why the product may have these symbols.

Product	Symbol(s)	Explanation

Did you find any hazard symbols that you did not see in the laboratory? \_\_\_\_\_

What do they mean? \_\_\_\_\_

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

# Hazard Symbols Match and Draw

Hazard symbols are used to warn us about the potential hazards of a substance.

Draw one line from each symbol to the meaning of that symbol, then draw one line from each meaning to the correct description.

## Symbol

## Meaning

## Description

flammable

Could cause illness or death if taken into the body.

moderate health hazard

Catches fire when it comes into contact with oxygen and a heat source.

corrosive

Could irritate the skin.

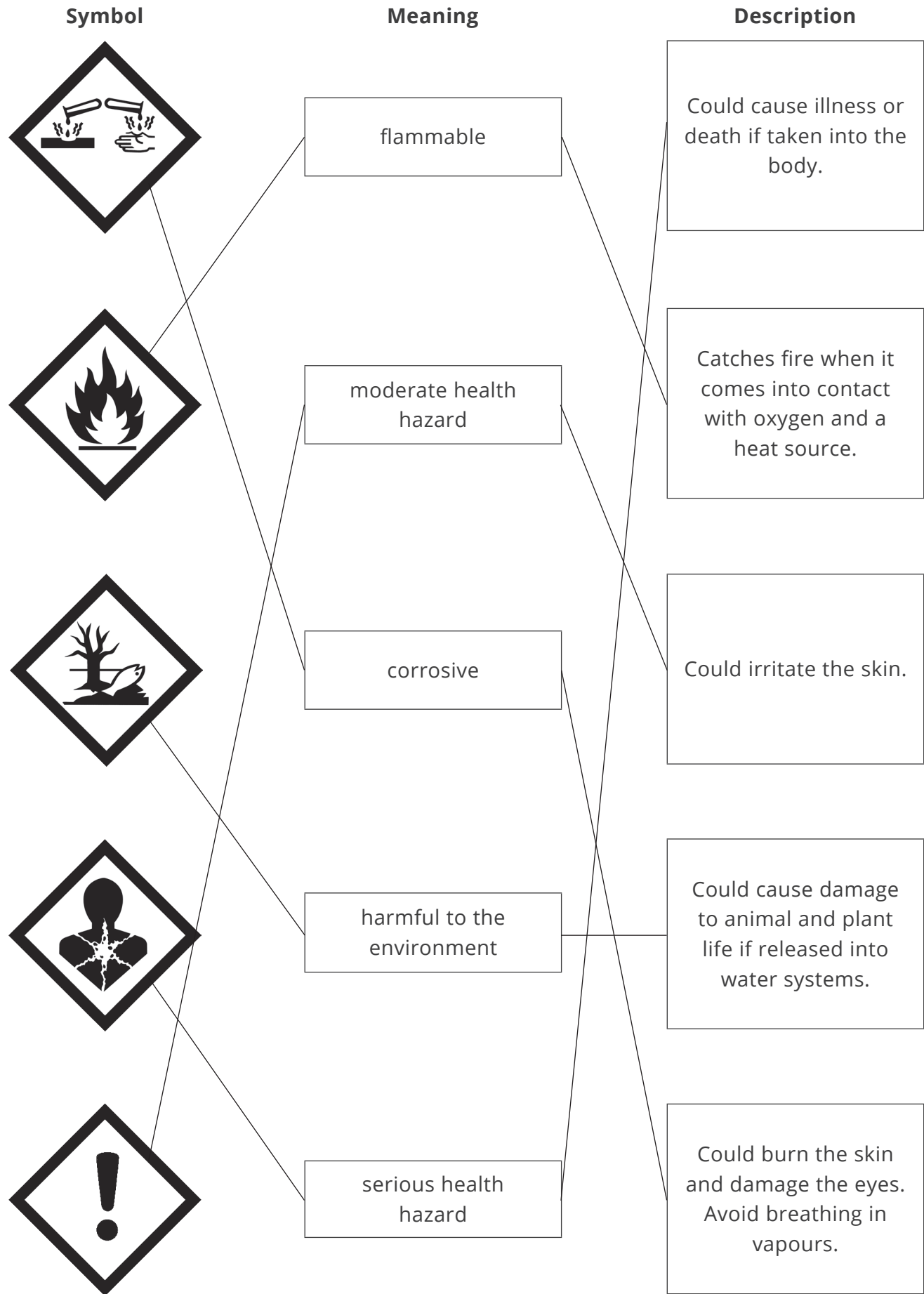
harmful to the environment

Could cause damage to animal and plant life if released into water systems.

serious health hazard

Could burn the skin and damage the eyes. Avoid breathing in vapours.






# Hazard Symbols Match and Draw **Answers**



# Hazard Symbols Match and Draw

Hazard symbols are used to warn us about the potential hazards of a substance.

Draw one line from each symbol to the meaning of that symbol, then draw one line from each meaning to the correct description.






Symbol	Meaning	Description
	flammable	Could cause illness or death if taken into the body.
	moderate health hazard	Catches fire when it comes into contact with oxygen and a heat source.
	corrosive	Could irritate the skin.
	harmful to the environment	Could cause damage to animal and plant life if released into water systems.
	serious health hazard	Could burn the skin and damage the eyes. Avoid breathing in vapours.



# Hazard Symbols Match and Draw

Hazard symbols are used to warn us about the potential hazards of a substance.

Draw one line from each symbol to the meaning of that symbol, then draw one line from each meaning to the correct description.

Symbol	Meaning	Description
	<input type="text" value="flammable"/>	<input type="text" value="Could cause illness or death if taken into the body."/>
	<input type="text" value="moderate health hazard"/>	<input type="text" value="Catches fire when it comes into contact with oxygen and a heat source."/>
	<input type="text" value="corrosive"/>	<input type="text" value="Could irritate the skin."/>
	<input type="text" value="harmful to the environment"/>	<input type="text" value="Could cause damage to animal and plant life if released into water systems."/>
	<input type="text" value="serious health hazard"/>	<input type="text" value="Could burn the skin and damage the eyes. Avoid breathing in vapours."/>



## Health and Safety Teaching Ideas

### Learning Objective:

To understand the importance of working safely in a laboratory.

### Success Criteria:

- To identify some important safety rules in a laboratory.
- To recall and identify hazard symbols.
- To explain how to keep yourself and others safe in a laboratory, especially during practical investigations.

### Context

This lesson is part of the Introduction to Science unit of work, focusing on health and safety in a science classroom.

### Resources

containers of chemicals with hazard symbols, e.g. hydrochloric acid 0.5M, sodium hydroxide 0.5M, nitric acid 0.5M, calcium carbonate, magnesium ribbon  
mini whiteboards and pens (optional)

## Starter

### Laboratory Hazards

From the picture on the PowerPoint, students identify hazards in the lab during a practical. Tell the students they can work as a table or in pairs to come up with as many as they can. They then share their ideas with the class. Encourage students to challenge themselves by completing the extension activity and come up with suggestions to prevent these hazards. A quick class discussion around why health and safety are so important will link the next part of the lesson.

## Main Activities

### Hazard Symbols

What do the following hazard symbols show? This can be done by going through each one on the PowerPoint and students writing their answers on mini whiteboards or using the **Hazard Symbols Match and Draw** worksheet. The answers appear one by one on the following slides or the **Hazard Symbols Match and Draw Answers** can be used for peer- or self-assessment.

Following naming the hazard symbols, students have a go at describing the meaning of each of the hazard symbols. This can be completed on the same **Hazard Symbols Match and Draw** or using mini whiteboards. The answers appear one by one on the following slides or the **Hazard Symbols Match and Draw Answers** can be used for peer- or self-assessment. The match and draw does not include the acute toxicity hazard symbol or the explosive hazard symbol. Discuss with the class why hazard symbols are so important.

### Hazard Symbols in the Lab

Students go around the room and fill in the **Chemicals and Hazards Table**. Bring the class together to discuss their findings. Some may have found more than one hazard symbol on each chemical.

### Safety Rules in the Lab

Discuss lab safety rules with the class. Ask the students to look at the pictures and describe the rules. Then ask students to place the rules in order of most important to least. Some students may be able to think of some rules of their own. Ask students to list six of the most important safety rules. To support lower ability students, use the **Safety Rules Worksheet**. The **Safety Rules Answers** can be used to self- or peer-assess.

### Problem-Solving

Students read the scenarios and explain, in their own words, what the teacher/student should do. This could be a discussion activity in groups or an independent activity using the **Problem-Solving Worksheet**. Using the answers on the next slide or on the **Problem-Solving Worksheet Answers** students could peer- or self-assess.

## Plenary

### Hazard Symbols Quiz

Students hold up answers on their mini whiteboards.

### **Hazards in the Home**

Learning can be extended at home with the Hazards in the Home worksheet. Students must ask a responsible adult to help them find products in the home with hazard symbols on.

### **Disclaimer**

**We hope you find the information on our website and resources useful. This resource refers to the use of chemicals. The use of chemicals is potentially hazardous. It is your responsibility to assess whether it is safe to use chemicals in your classroom. You are responsible for ensuring the safe storage, usage, labelling and disposal of chemicals in accordance with COSHH regulations (or equivalent in the country in which you are teaching). We are not responsible for the health and safety of your group or environment and so, insofar as it is possible under the law, we cannot accept liability for any loss suffered by anyone due to the use, storage or disposal of chemicals or any other activity carried out as a result, whether directly or indirectly, of this resource. If you are unsure in any way, we recommend that you take guidance from a suitably qualified professional.**



# Introduction to Science: **Health and Safety**

## Learning Objective

To understand the importance of working safely in a laboratory.

## Success Criteria

- To identify some important safety rules in a laboratory.
- To recall and identify hazard symbols.
- To explain how to keep yourself and others safe in a laboratory, especially during practical investigations.



# Laboratory Hazards

From the picture below, identify any hazards in the lab.



**Extension:**

Can you suggest any precautions the students could take to make the lab safer?



# Why Is Safety So Important?

What do you use a laboratory for and why is safety so important?

Discuss with your table – you have **two** minutes to come up with an answer.

**A science laboratory is used for carrying out practical investigations. They can involve using dangerous chemicals and practical equipment such as Bunsen burners.**

**Some practical equipment, such as test tubes, are easily breakable so care must be taken.**

**The pupils' and teacher's health and safety are very important so that no one gets hurt.**



# Hazard Symbols

What do you think the following hazard symbols show?



corrosive



flammable



harmful to the environment



serious health hazard



moderate health hazard



explosive



acute toxicity

# Hazard Symbols Descriptions

What do you think the following hazard symbols mean?

1



Could burn the skin and damage the eyes. Avoid breathing in vapours.

2



Catches fire when it comes into contact with oxygen and a heat source.

3



Could cause damage to animal and plant life if released into water systems.

4



Could irritate the skin.

5



Could cause illness or death if taken into the body.

# Hazard Symbols

Why are hazard symbols so important?

Write down your answers on a mini whiteboard and hold them up.

You have **two** minutes.

**They show people how dangerous a chemical is, and what precautions should be taken when handling them.**

**Extension:**

Why use symbols?

**Symbols can be used all over the world and are immediately recognisable, so it doesn't matter which language is used.**

# Hazard Symbols in the Lab

What hazard symbols can you find around the laboratory?

Complete the table with the name of each chemical and its hazard symbol. You could either draw the hazard symbol or give its meaning.

## Extension:

Have you heard of any of these chemicals before? Do you know anything about them?

### Chemicals and Hazards Table

Complete the table with the name of each chemical and its hazard symbol. You could either draw the hazard symbol or give its meaning.

Chemical	Hazard Symbol

# Safety Rules in the Lab

From the diagrams below, work out what the rules are.

Which rule do you think is the most important in a lab? Put them in order from **most** important to **least** important.

Explain to the person next to you why you have put them in this order.



## Extension:

Can you add any of your own rules that are not shown here?

# Safety Rules in the Lab

Neatly, list **six** of the most important safety rules in the front of your book.



# Problem-Solving

Read the scenarios and explain what the teacher/student should do.

1. You spill a chemical on the desk during a practical. What should you do?
2. You notice a bag in the middle of the floor. What should you do?
3. Your teacher notices a student sitting down at the desk during a practical. What should they do? Why?
4. You feel hungry during a practical. What should you do?
5. You drop a glass beaker on the floor and it breaks. What should you do?

# Problem-Solving

Read the scenarios and explain what the teacher/student should do.

1. You spill a chemical on the desk during a practical. What should you do?

**Tell your teacher. Clear it up if they tell you to do so.**

2. You notice a bag in the middle of the floor. What should you do?

**Move the bag to either a bag storage area or place under the desk.**

3. Your teacher notices a student sitting down at the desk during a practical. What should they do? Why?

**Ask the pupil to stand up and push their chair under the desk. So, if there is a spillage, the pupil can move away more easily.**

4. You feel hungry during a practical. What should you do?

**Nothing. Wait until break or lunchtime.**

5. You drop a glass beaker on the floor and it breaks. What should you do?

**Tell your teacher. They will brush it up and place it in a glass bin.**



# Hazards in the Home

Find **five** products around the house that have chemical hazard symbols on them.

Write down the name of the product, the hazard symbol(s) on the product and explain why the product may have these symbols.

**A responsible adult must be present!**

Did you find any hazard symbols that you did not see in the laboratory?

What do they mean?

# Hazard Symbols Quiz



## Question 1

What does this hazard symbol mean?

- a) corrosive
- b) harmful to the environment
- c) **flammable**

# Hazard Symbols Quiz



## Question 2

What does this hazard symbol mean?

- a) corrosive
- b) harmful to the environment**
- c) flammable

# Hazard Symbols Quiz



## Question 3

What does this hazard symbol mean?

- a) **corrosive**
- b) harmful to the environment
- c) flammable

# Hazard Symbols Quiz



## Question 4

What does this hazard symbol mean?

- a) flammable
- b) moderate health hazard
- c) **serious health hazard**

# Hazard Symbols Quiz



## Question 5

What does this hazard symbol mean?

- a) flammable
- b) moderate health hazard**
- c) serious health hazard





# Problem-Solving

1. You spill a chemical on the desk during a practical. What should you do?

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## Problem-Solving Answers

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**Ask the pupil to stand up and push their chair under the desk. So, if there is a spillage, the pupil can move away more easily.**

4. You feel hungry during a practical. What should you do?

**Nothing - wait until the lesson has finished (break/lunch).**

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**Tell your teacher. They will brush it up and place it in a glass bin.**

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4. You feel hungry during a practical. What should you do?

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5. You drop a glass beaker on the floor and it breaks. What should you do?

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# Safety Rules

1. Always wear \_\_\_\_\_ during a practical.
2. Stand \_\_\_\_\_ during a practical.
3. Do not \_\_\_\_\_ or \_\_\_\_\_ during a practical
4. No \_\_\_\_\_ around the lab.
5. \_\_\_\_\_ long hair back.
6. When something gets broken, tell a \_\_\_\_\_.

**Can you think of anything else to add to the list?**

7. \_\_\_\_\_  
\_\_\_\_\_
8. \_\_\_\_\_  
\_\_\_\_\_
9. \_\_\_\_\_  
\_\_\_\_\_
10. \_\_\_\_\_  
\_\_\_\_\_

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# Safety Rules

1. Always wear  during a practical.
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6. When something gets broken, tell a .

**Can you think of anything else to add to the list?**

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8.

9.

10.

# Safety Rules **Answers**

1. Always wear **goggles** during a practical.
2. Stand **up** during a practical.
3. Do not **eat** or **drink** during a practical
4. No **running** around the lab.
5. **Tie** long hair back.
6. When something gets broken, tell a **teacher**.

**Can you think of anything else to add to the list?**

**Students will have their own answers. Allow any sensible suggestion.**

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# Safety Rules **Answers**

1. Always wear **goggles** during a practical.
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# Safety Rules

1. Always wear \_\_\_\_\_ during a practical.
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**Can you think of anything else to add to the list?**

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