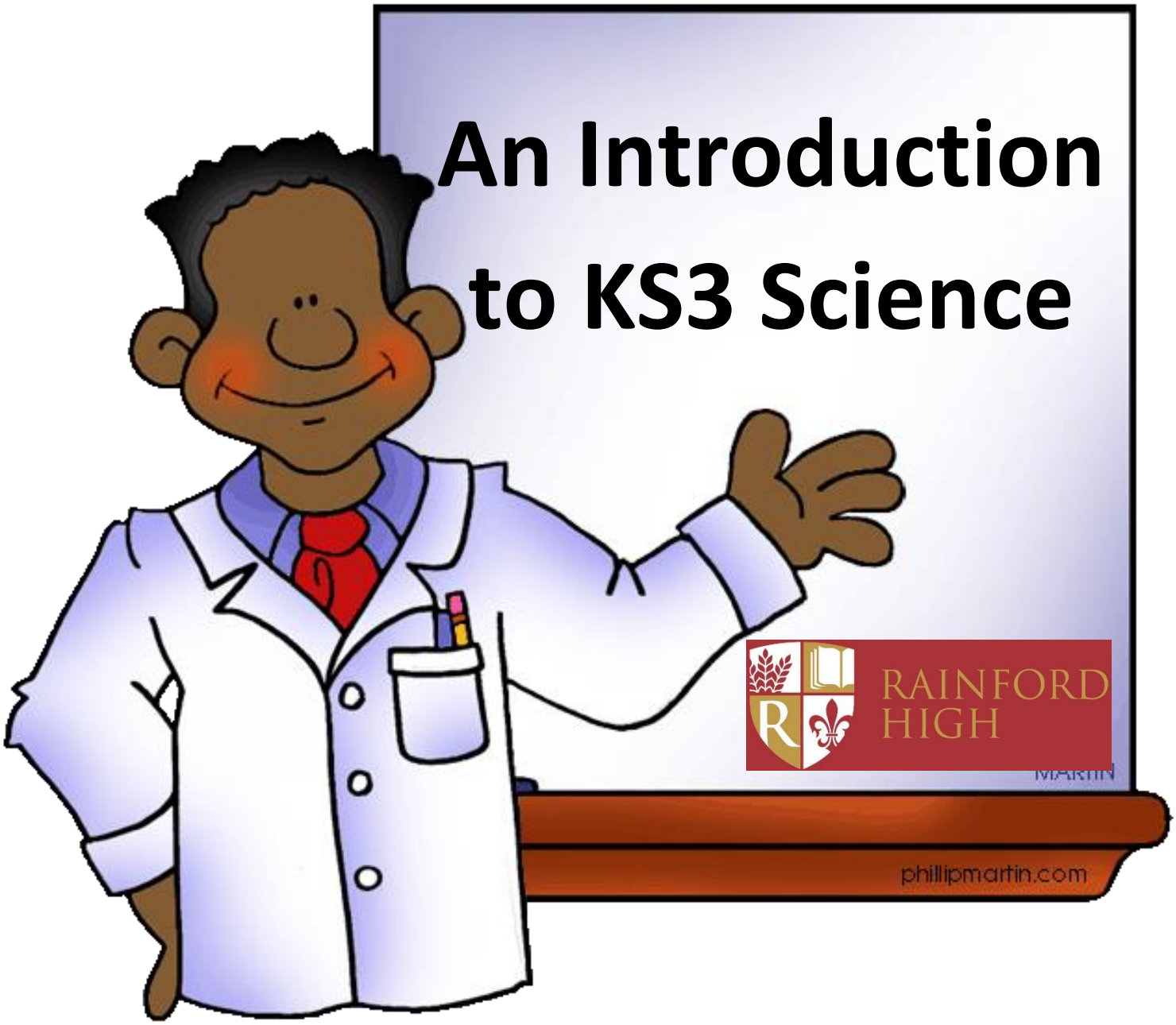
An Introduction to KS3 Science

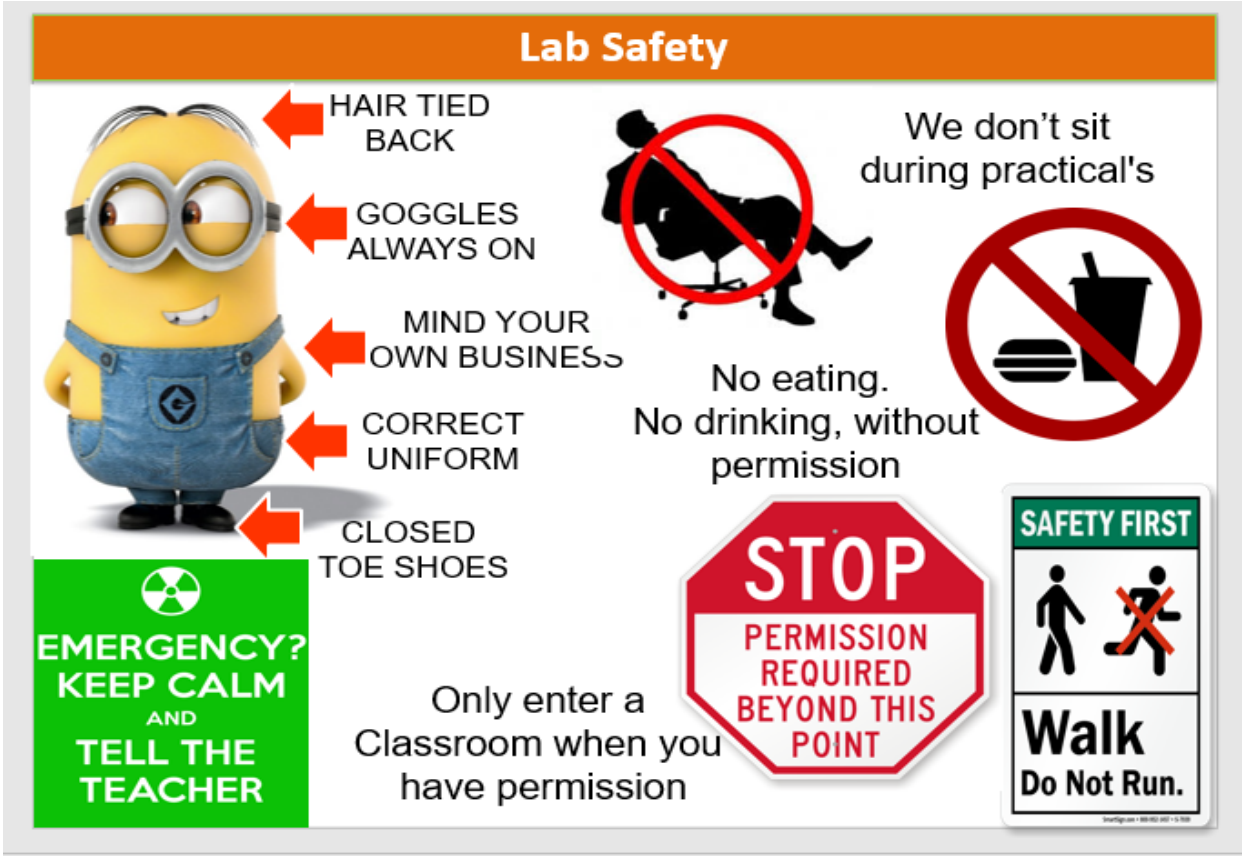


Science Summer Learning

Contents

Safety in the Lab!

You will always find a set Lab rues when working in a lab, it is important that you follow these rules safely to protect yourself and others around you!



Safety in the lab continued

The drawing below shows a lab where there are no safety rules.

1. **Highlight or circle all the hazards / things going wrong in this lab.**

Use the information gathered from an earlier task to produce 10 working safely rules for your lab.

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Hazard Symbols!

Hazards

A hazard is something that could cause:

- harm to someone
- damage to something
- adverse health effects, either straightaway or later

For example, concentrated acids are corrosive. This is a hazard because acids can damage skin and clothes if they are spilt.

Using hazard symbols

Hazard symbols are used on containers. They are there to:

- indicate the dangers associated with the substance inside
- give information about how to work safely with the substance in the laboratory

Hazard symbols are designed to provide a warning, even if a person cannot understand the writing that goes with them.

Hazard symbol	Meaning	Typical hazard
	Moderate health hazard	Causes skin irritation
	Serious health hazard	Causes breathing difficulties
	Toxic	Could cause death if swallowed or inhaled
	Corrosive	Damages skin and clothing
	Flammable	Catches fire easily
	Oxidising	Makes flammable substances burn more fiercely
	Harmful to the environment	Could cause damage to animal and plant life

Activity: Use the words below to label each symbol

Harmful to the environment | Oxidising | Explosive | Serious health hazard | Harmful | Toxic | Corrosive | Flammable

....

....

Activity: Match the symbols to different situations

a) A liquid fuel used to start off a barbecue

b) A weed killer that if ingested could kill and can make fires burn faster

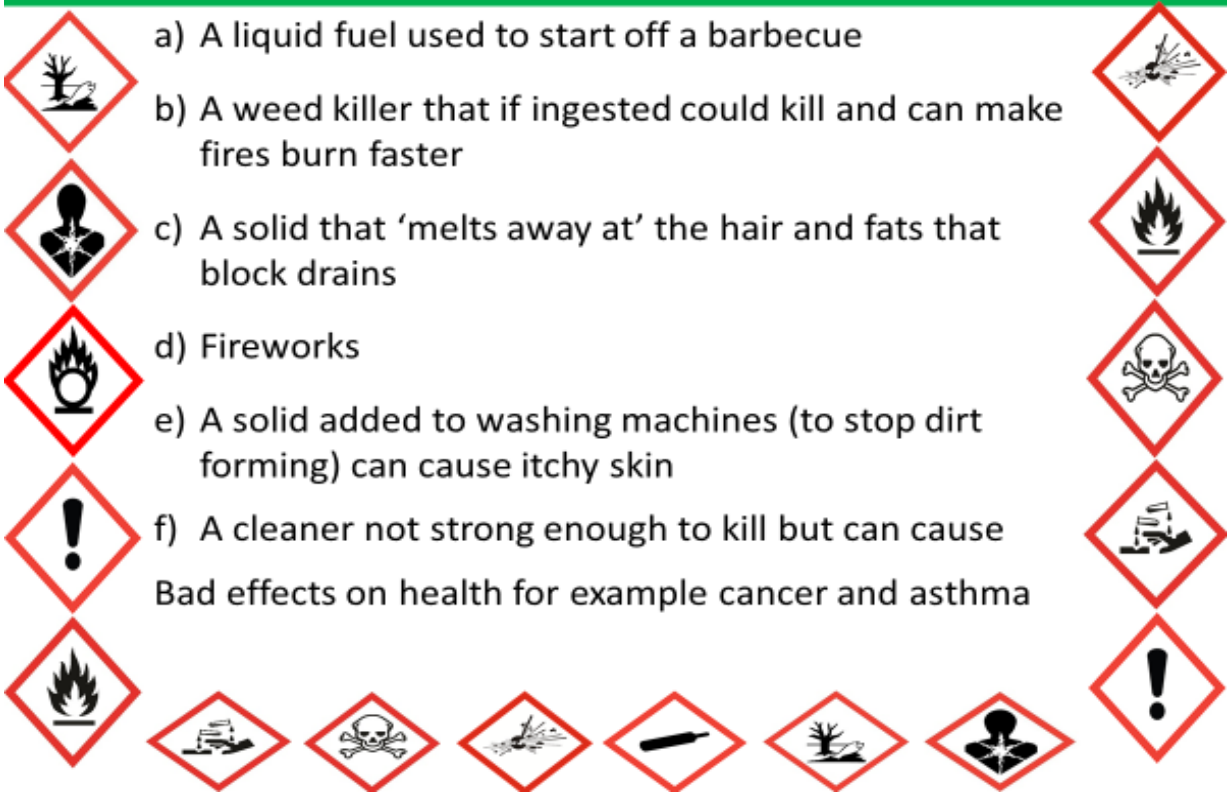
c) A solid that 'melts away at' the hair and fats that block drains

d) Fireworks

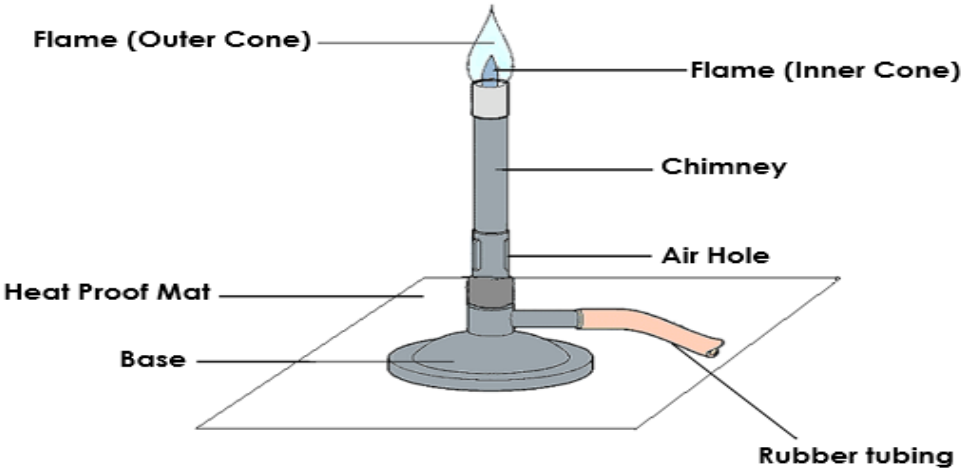
e) A solid added to washing machines (to stop dirt forming) can cause itchy skin

f) A cleaner not strong enough to kill but can cause

Bad effects on health for example cancer and asthma



The Bunsen Burner!



When using a Bunsen burner you MUST follow the lab safety rules!
Wear goggles and tie hair back!

1. Place the Bunsen burner on a **heatproof mat**.

2. Connect the rubber tubing on the Bunsen burner to a gas tap on your desk. **Do not turn the gas tap on yet**.

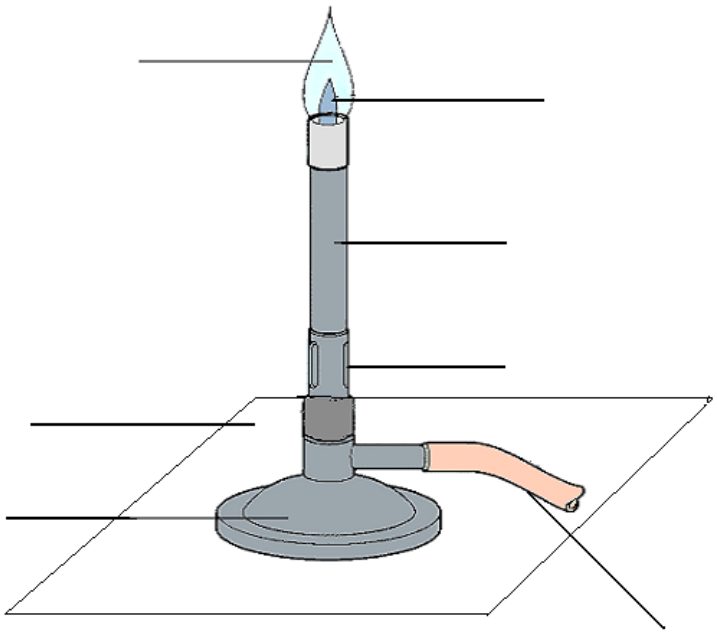
3. Make sure the air hole is completely closed on your Bunsen burner and then light a splint from the Bunsen burner lit by the teacher and carefully walk with it to your Bunsen burner.

4. Turn on the gas tap that is connected to your Bunsen burner and hold the lit splint at the top of the Bunsen burner. This should light it.

The air hole of the Bunsen burner determines what flame will appear from the Bunsen burner chimney. This is shown in the table below:

	Air hole open	**Air hole half-open**	**Air hole closed**
Type of Flame	Roaring Flame	Blue Flame	Safety Flame
When do we need to use this flame?	To heat things fast	To heat things slowly	When we are not using the Bunsen but want to keep it on.

Label the diagram of the Bunsen burner below

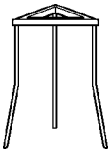
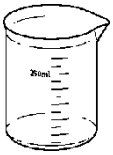
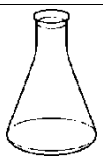
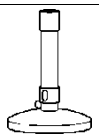
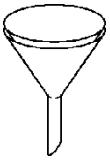
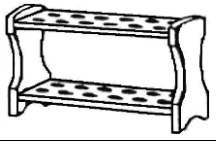


Fill in the gaps of the table

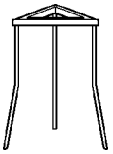
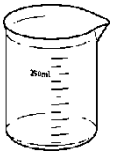
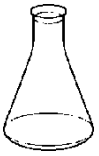
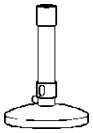
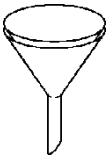
	Air hole open	**Air hole half-open**	**Air hole closed**
Type of Flame			
When do we need to use this flame?			

Science Lab Equipment

Here is some common equipment used in science lessons. You will need to be able to use this equipment properly.

Equipment	Name	Equipment	Name
	Test tube		Measuring cylinder
	Boiling tube		Tripod
	Beaker		Gauze
	Conical flask (i.e. cone-shaped)		Bunsen burner
	Crucible		Filter funnel (with paper)
	Tongs		Test tube holders
	Mortar and pestle		Thermometer
	Pipe clay triangle		Test tube holder
	Stand boss and clamp		Balance
	Dropping pipette		Evaporating basin
	Glass rod		Spatula

Task – Fill in the name of each piece of equipment I the table below

Equipment	Name	Equipment	Name
			
			
			
			
			

Planning an investigation

When planning an investigation, you need to ensure that the results that you obtain will be valid. In order to do this you need to make sure that one variable is changed during your investigation.

Identify the variables

Independent variable – the variable that is altered during a scientific experiment.

Dependent variable – the variable being tested or measured during a scientific experiment.

Controlled variable – a variable that is kept the same during a scientific experiment. Any change in a controlled variable would invalidate the results.

Consider the following investigation:

- On the way home from school Bart and Millhouse stop off at the skate park.
- The two of them decide to have a downhill race on their skate boards over a distance of 10 metres.
- For a challenge, Bart thinks it would be a good idea for both of them to put different numbers of school books on their head's.
- They get Lisa to time them and calculate their speed.

In this investigation the variables would be

Independent variable- The number of books on their head

Dependent variable- Their speed

Control Variable- The distance of 10 Meters

Consider the next experiment-

- Lisa decides to test how the length of rope will affect the number of skips in 10 minutes.
- She has three different sizes of ropes -1 meter, 2 meters and 3 meters.
- She asks Marge to time her using a stopwatch and she asks Bart to count the number of skips.

Fill in the table to show each of the different variables

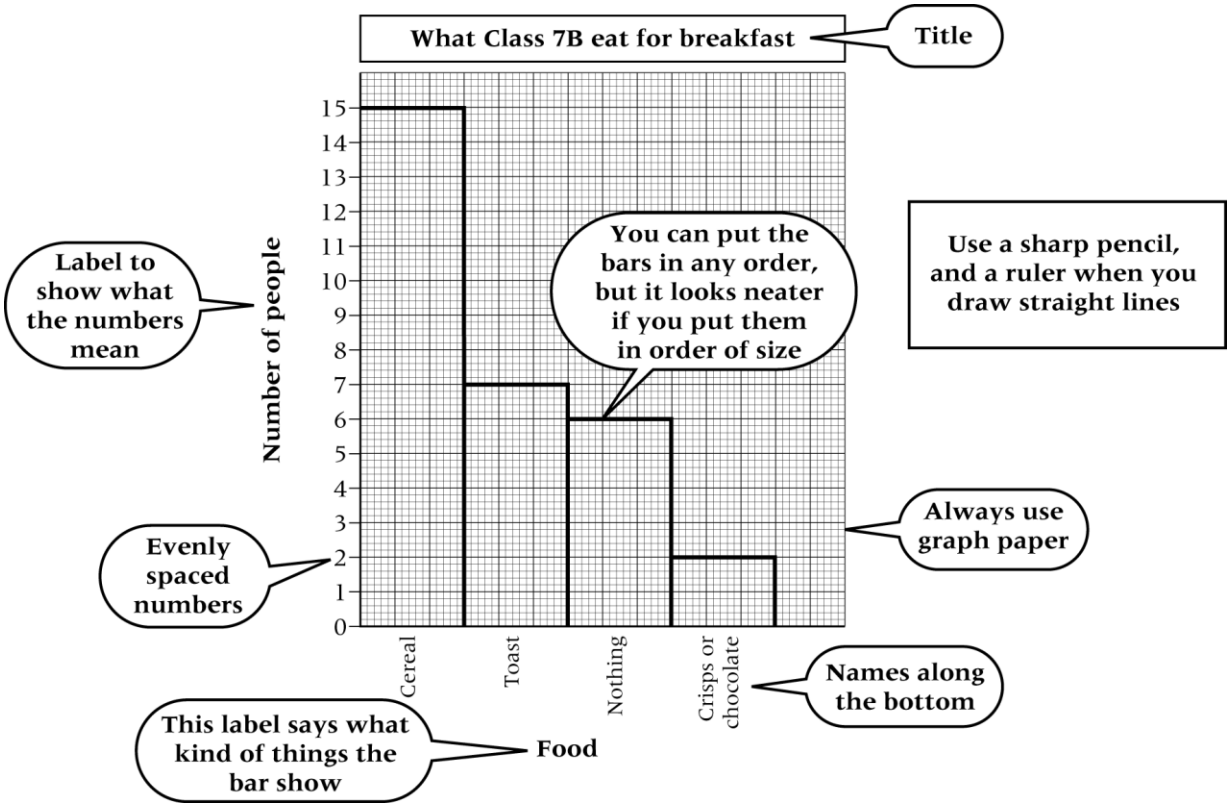
Independent Variable	
Dependent Variable	
Control Variable	

Bar charts

You have done a survey to show what the people in your class had for breakfast, and these are your results:

Food	Number of people
cereal	15
toast	7
crisps or chocolate	2
nothing	6

You would draw a bar chart like this one to show your results:



Draw bar charts to show the results of these surveys.

a Number of plants in a lawn

Plant	Number
Daisy	10
Buttercup	7
Clover	20
Thistle	2