

Welcome to S1



Science booklet and jotter

24/09/2024

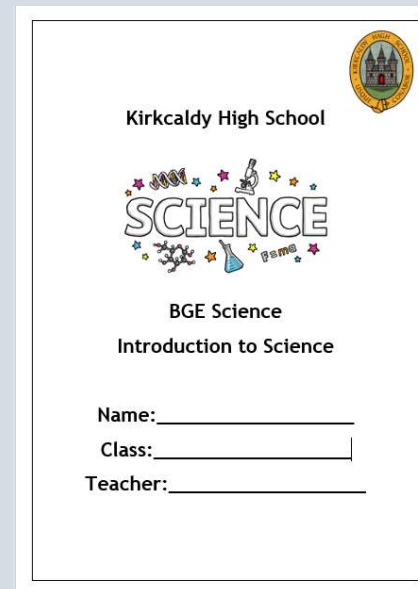
Write on the front of your Jotter/ booklet



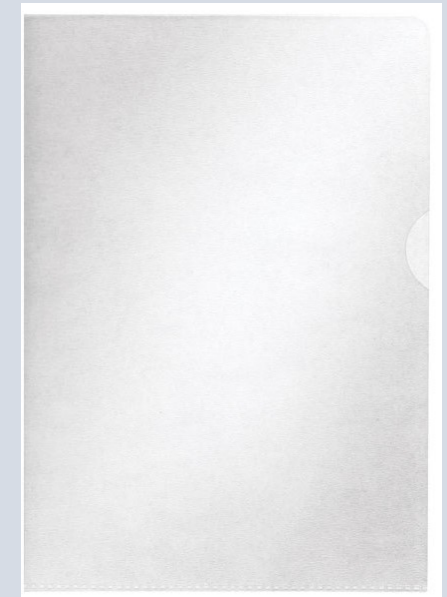
- Your Name
- Class
- Teacher's name
- Science (jotter only)



jotter



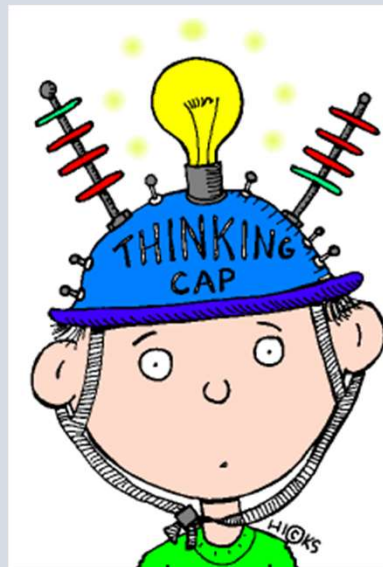
booklet



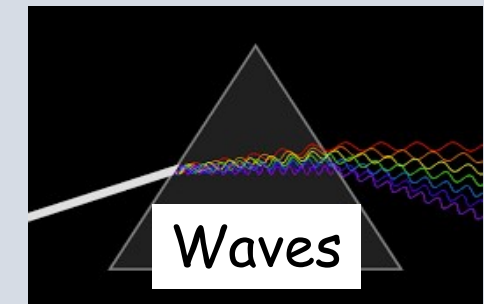
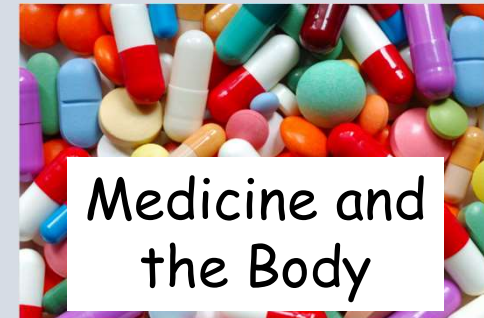
folder

Starter:

1. Why is Science important in our everyday lives?
2. A Science classroom is different from other classrooms. What differences can you see?



What is Science all about ?

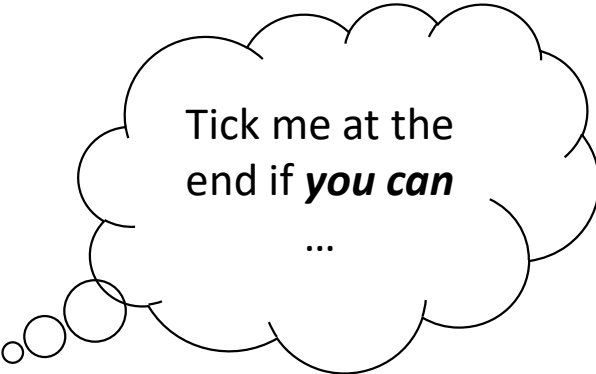


Learning Intentions:

- To understand the dangers associated with working in a science classroom (laboratory).
- To know how to keep the laboratory a safe environment.
- To identify the safety symbols shown in a laboratory.

Success Criteria

- I can state the dangers associated with working in a Science classroom.
- I can describe a safe laboratory environment.
- I can identify the safety symbols shown in a laboratory.



Tick me at the
end if ***you can***

...

A science classroom is different to others you have been in. There are many hazards for you to encounter here.

To make science as safe as possible, there are rules which must be followed in the class.

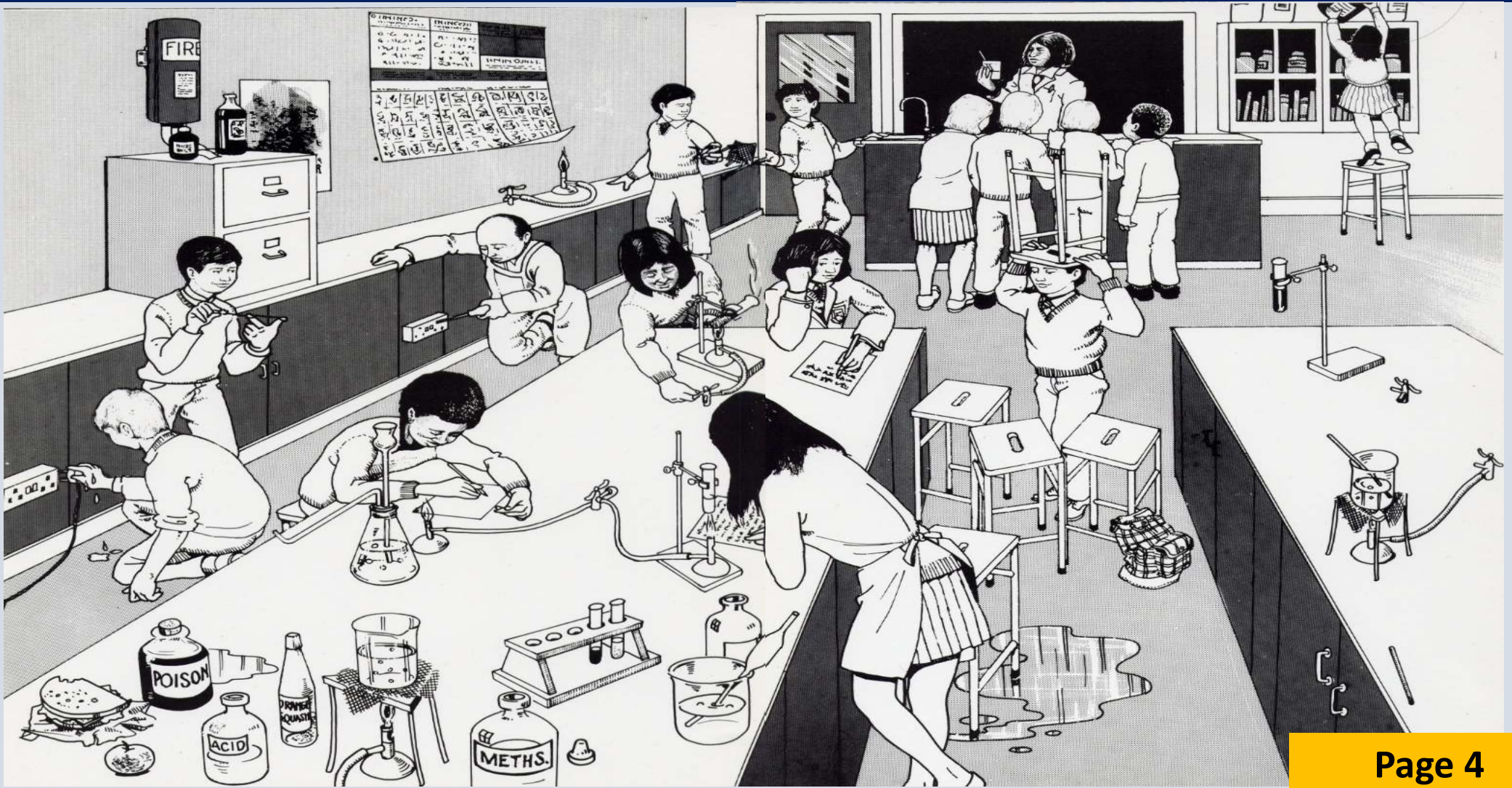
This is especially important when doing experiments.



In your pair, discuss the hazards which are present in a science classroom.



An unsafe classroom - circle the safety issues in the picture below



Science Safety

Activity: Can you think of your own safety rules? (HINT: Use the picture on the previous page for inspiration). Write down **at least 3** science safety rules.

1.

2.

3.



**Be prepared to
feedback to the class.**

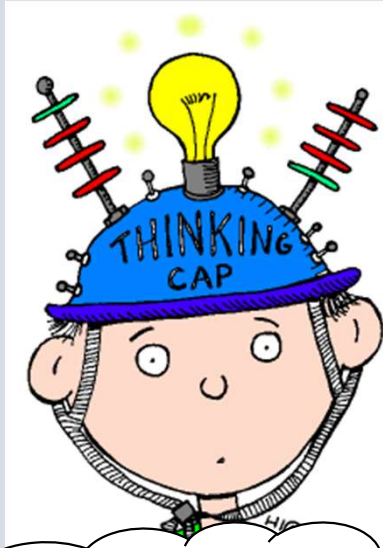
Science Safety

1. Never enter a science lab until a teacher is present.
2. Coats and outside garments MUST be removed.
3. Always wear safety glasses when performing an experiment.
4. Only perform the experiments you are told to do.
5. Never eat, drink or taste anything in the lab.
6. Always inform the teacher of accidents straight away.
7. Make sure all chairs and bags are pushed under desks to avoid accidents.
8. Never run in the lab.
9. When in doubt, ASK A TEACHER.



Plenary:

How can we stay safe in the Science classroom?



Tick me at the
end if ***you can***

...

Success Criteria

- I can state the dangers associated with working in a Science classroom.
- I can describe a safe laboratory environment.
- I can identify the safety symbols shown in a laboratory.



Starter:

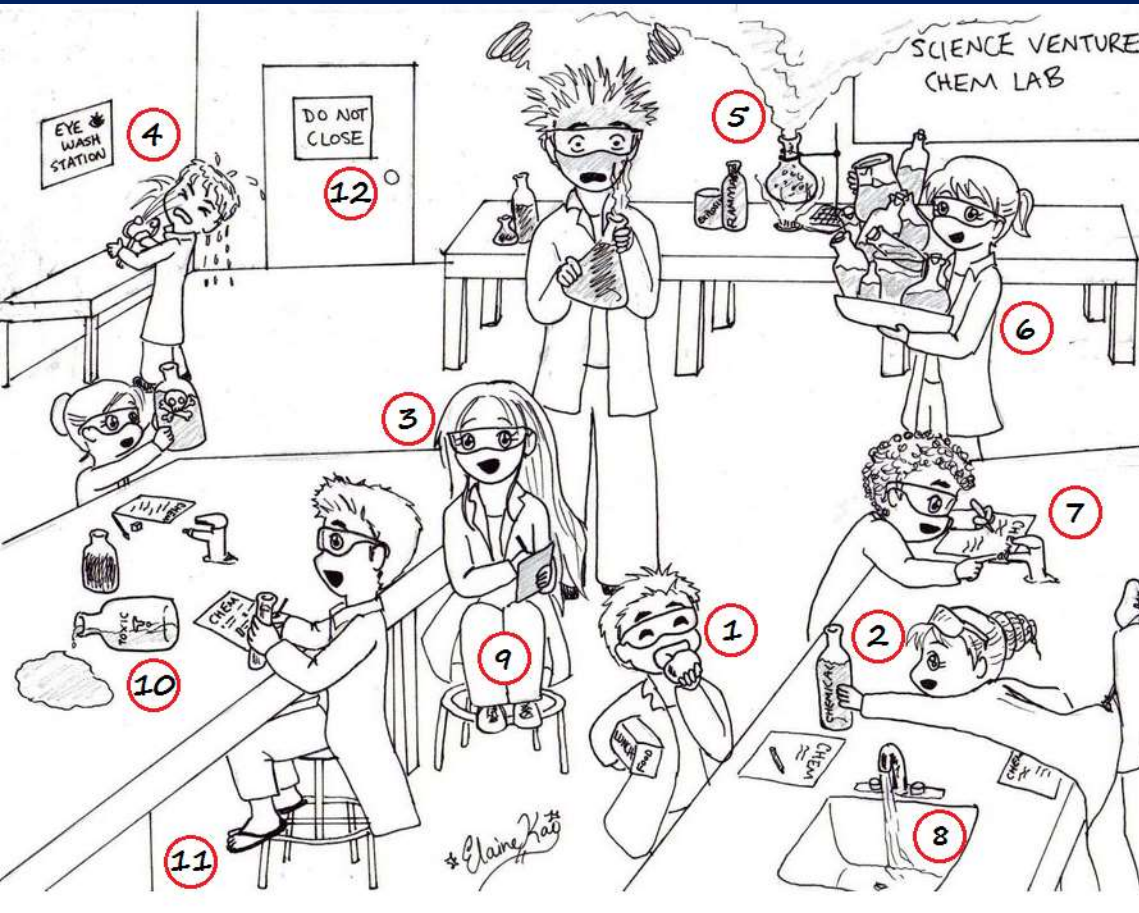


The Cartoon shows (at least!) 12 Safety Hazards in a Science Lab. What hazards do you see?

Safety Symbols

24/09/2024

Page 6



- 1 - Eating in Lab
- 2 - Not wearing Goggles
- 3 - Hair not tied back
- 4 - Misuse of kit
- 5 - Unattended experiment
- 6 - Unsafe carrying

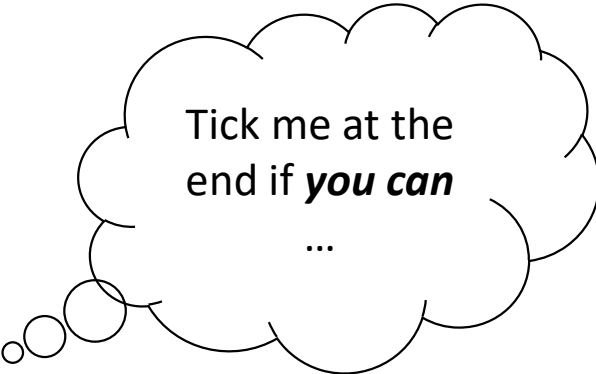
- 7 - Touching Gas Tap
- 8 - Sink left running
- 9 - Sitting during Experiment
- 10 - Spill not cleaned up
- 11 - Unsafe shoes
- 12 - Rules not being followed

Learning Intentions:

- To understand the dangers associated with working in a science classroom (laboratory).
- To describe how to keep the laboratory a safe environment.

Success Criteria

- I can name the dangers associated with working in a Science classroom
- I know how to keep the laboratory safe
- I can identify the safety symbols shown in a laboratory.



Tick me at the
end if ***you can***

...

Safety Symbols

In the Science classroom, you will be working with lots of different pieces of equipment and chemicals, all of which must be handled safely.



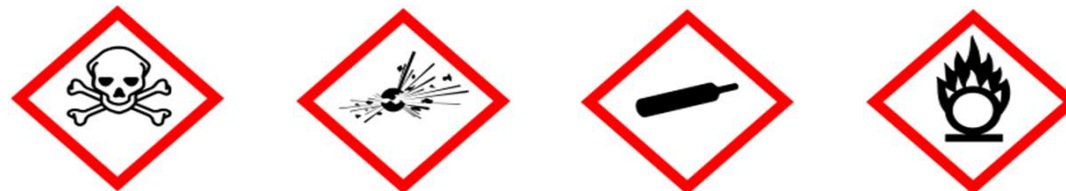
In order to keep you safe, chemicals that can cause harm are labelled with Hazard Symbols.

These same symbols are used all over the world, so it doesn't matter if you speak the local language, you can always be safe!

Safety Symbols

These are examples of the common symbols found within the Science Lab.

Activity: Label the safety symbols below:



Safety Symbols



Long Term
Health Hazard



Flammable



Corrosive



Harmful/
Irritant



Dangerous for the
environment



Toxic



Explosive



Compressed
gas



Oxidising (causes
something else to
burn)





LONGER TERM HEALTH HAZARD

Causes serious health damage including reproductive toxicity, problems with your respiratory system, germ cell mutagenicity, carcinogenicity etc.



FLAMMABLE

Highly harmful substances that cause death if swallowed, inhaled or absorbed through the skin.



CORROSIVE

Strong chemicals that can damage your skin or any other substances.



CAUTION

Substances that irritate eyes and skin causing itchiness, soreness, redness and blistering.



HAZARDOUS TO AQUATIC ENVIRONMENT

Chemicals that are potentially hazardous to the environment – if not properly disposed of, they can contaminate soil and water, and can be lethal for aquatic animals and trees.



ACUTE TOXICITY

Highly harmful substances that cause death if swallowed, inhaled or absorbed through the skin.



EXPLOSIVE

Substances that can produce an explosion if released suddenly



GASES UNDER PRESSURE

Hazardous because of high pressures inside the cylinders. Gas can be released deliberately by opening the cylinder valve, or accidentally from a broken or leaking valve or from a safety device



OXIDISING

Can provide oxygen to flammable substances to burn when used in lab. Must be stored separately from flammables.

Safety Symbols

Activity: Design your own safety symbol

Design your own safety symbol. Your safety symbol could refer to the science safety rules

Examples:



Always wear safety glasses during experiments.



Never run in the laboratory.



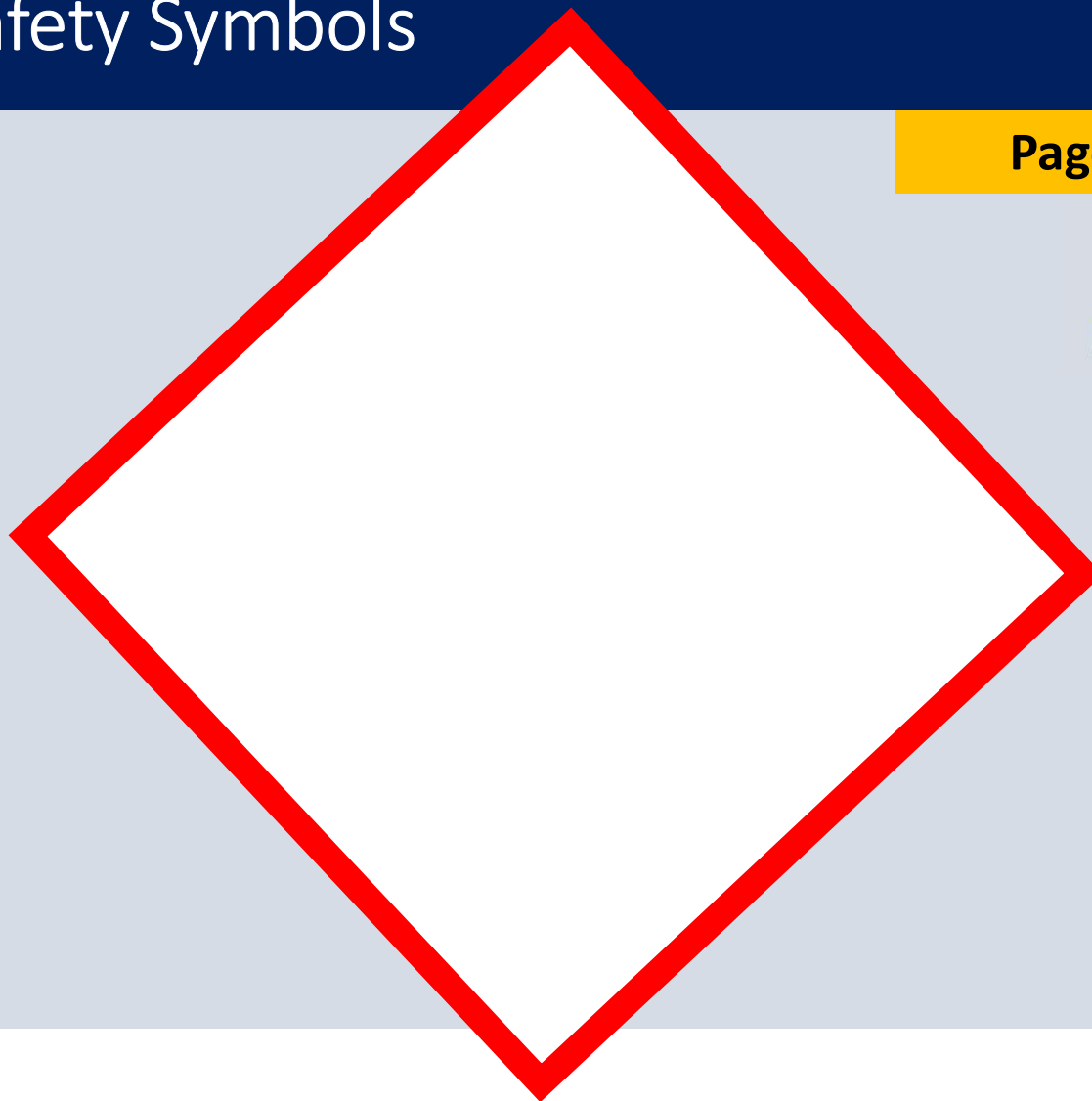
Stand up when doing experiments.

Safety Symbols



Activity: Design your own safety symbol

Design your own safety symbol. Your safety symbol could refer to the science safety rules.



Extension:

Go to the back of the booklet and complete a word search, riddle or colouring page.

Plenary: Match the hazard symbol to its definition.

1



2



3



- A. Dangerous for the environment
- B. Flammable
- C. Harmful/ Irritant

Tick me at the end if *you can*

...

Success Criteria

- I can name the dangers associated with working in a Science classroom
- I know how to keep the laboratory safe
- I can identify the safety symbols shown in a laboratory

Starter:

What safety rules must be followed when using the Bunsen burner?

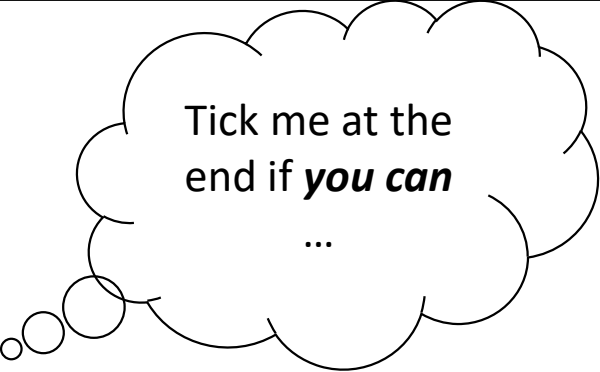


Learning Intentions:

- To learn how to safely light a Bunsen burner.
- To be able to change the flames of a Bunsen burner

Success Criteria

- I can safely light a Bunsen burner.
- I can change the flames of a Bunsen burner



Tick me at the
end if ***you can***

...

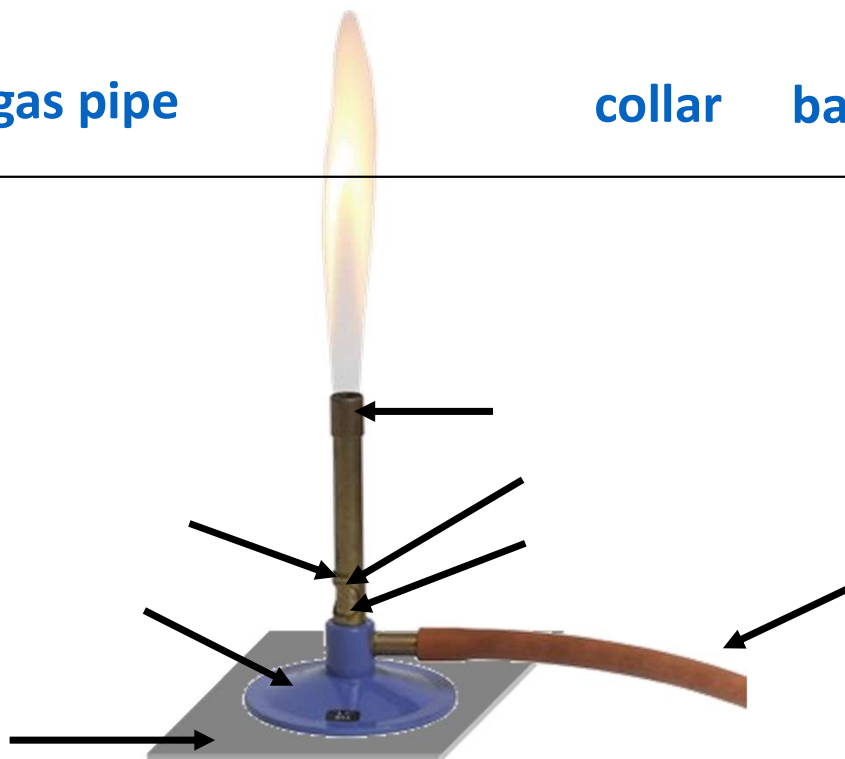
Bunsen Burner

Activity: Label the diagram of a Bunsen burner below (HINT: Use the word bank to help you)



Word Bank

barrel air hole gas jet gas pipe collar base heat proof mat



Using a Bunsen Burner

What safety rules do we need to follow when using the Bunsen burner?

Long hair tied back



Bags under desks



Chairs pushed in



No loose clothing



Wear safety glasses



How to light a Bunsen burner

Take it in turns to light your Bunsen burner safely.

1. Check the hose for breaks or holes
2. Connect hose to gas tap
3. Check air hole is closed
4. Light a splint and hold it above the nozzle
5. Turn on gas tap
6. The Bunsen will light with a yellow flame.
7. Turn the air hole to open to get a blue flame
8. Close the airhole
9. Turn off the gas tap

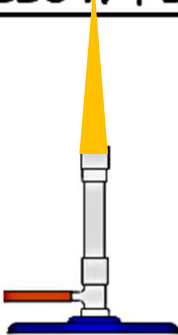
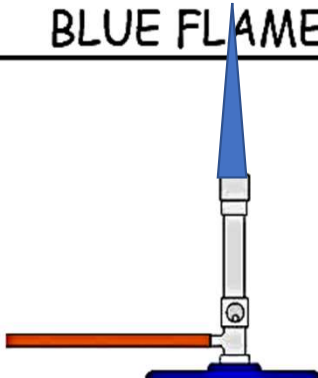


If your flame goes out, turn off the gas tap.

Bunsen Burners



Activity: Complete the diagram.

YELLOW FLAME	BLUE FLAME
	
<p>This is called the safety flame. When the Bunsen burner is not in use we use a yellow flame so it can be</p>	<p>This flame makes a noise. It is used to heat and is difficult to see.</p>
<p>Position of Airhole closed</p>	<p>Position of Airhole open</p>

Using a Bunsen Burner



Practical: Safety checklist

- Safety glasses were worn.
- Long hair was tied back and loose items of clothing tucked away.
- The Bunsen burner was placed on a heat resistance surface.
- The Bunsen burner is not too close to the edge of the desk.
- The burner was connected to the gas tap correctly.
- The air hole on the Bunsen burner was closed before lighting.
- The splint was lit before the gas was turned on.
- The splint was positioned correctly while the gas was turned on.
- The splint is disposed of safely
- The student can adjust the flame safely

Using a Bunsen Burner

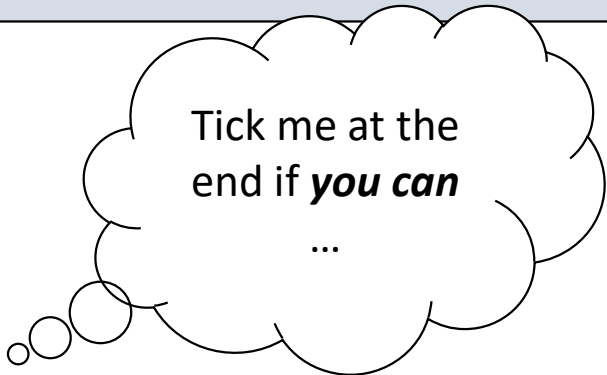
24/09/2024

Plenary:

1. What safety rules must you follow when using the Bunsen burner?
2. What colour are the two flames on a Bunsen burner?
3. Explain how you change from one flame to the other.

Success Criteria

- I can safely light a Bunsen burner.
- I can change the flames of a Bunsen burner



Tick me at the end if ***you can***

...

Starter:

1. What flame should you always light the Bunsen burner on?

Safety flame

2. What do you need to do immediately if the flame on your Bunsen burner goes out?

Turn the gas off

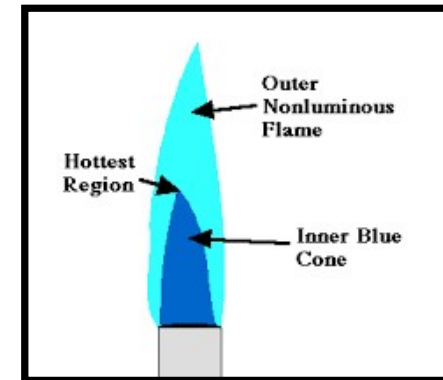
3. Which flame is the hottest flame?

Roaring flame - blue

4. What part of the flame is the hottest part?

5. Why is the safety flame named the safety flame?

You can see it (yellow flame)



Burning Magnesium

24/09/2024

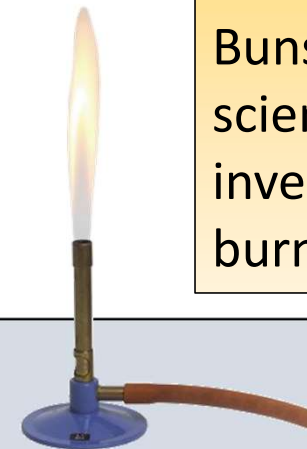
Learning Intentions:

- To use a Bunsen burner to burn magnesium.
- To write an aim, method and conclusion.

The gas used by a Bunsen burner is called Methane.

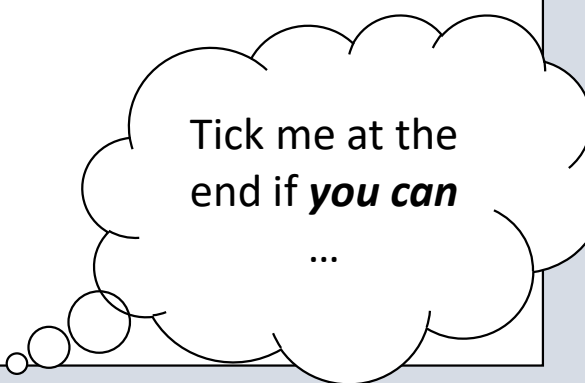
The hottest part of the flame is 1560°C .

Robert Wilhelm Bunsen is the scientist who invented the Bunsen burner



Success Criteria

- I can safely use a Bunsen burner to burn magnesium
- I can write an aim, method and conclusion.



Tick me at the
end if ***you can***

...

Scientific Report

Title

Aim: What are we trying to find out?

Method: What did you/we do?

Results: What did you observe?

Conclusion: What have we found out? What is the answer to the aim?

Evaluation: What can be done to improve your experiment?

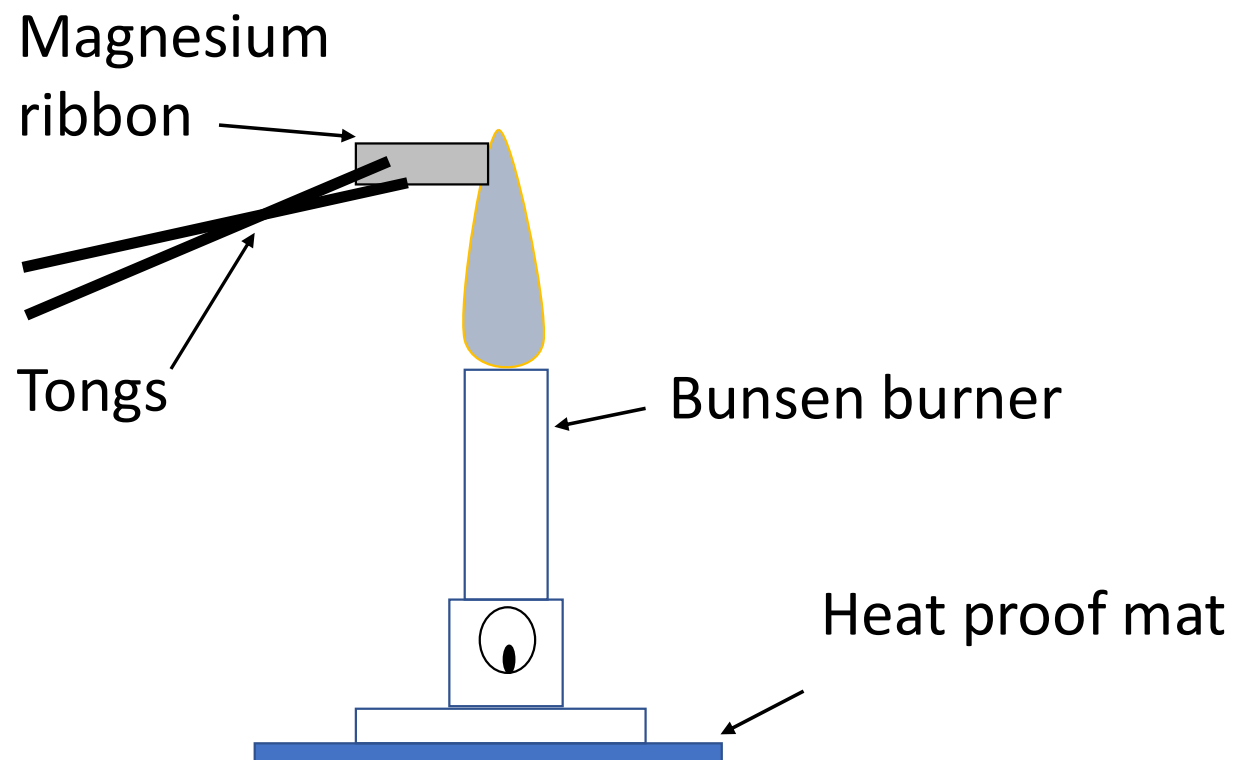


Burning Magnesium

Aim: What happens when magnesium ribbon burns?

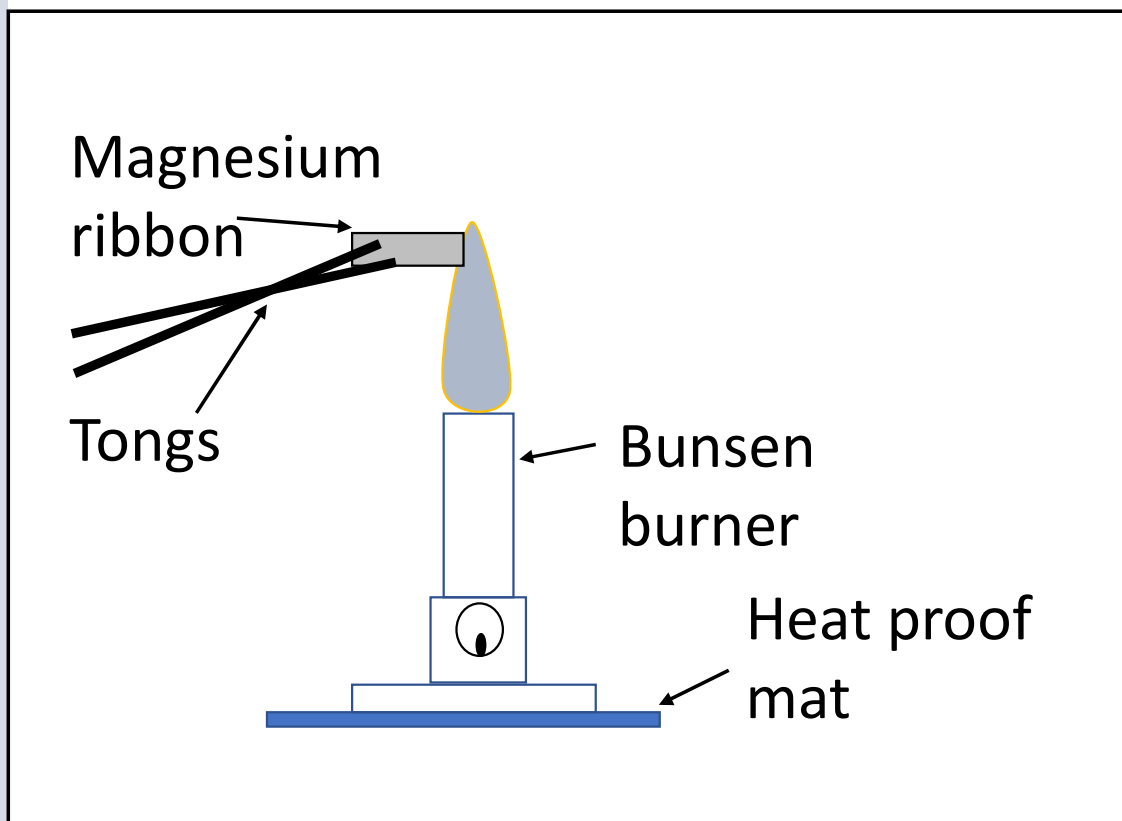
Page 11

Method: (draw a labelled diagram)



Burning Magnesium

Method: (draw a labelled diagram)



Page 11

1. Safely light your Bunsen burner so you have a safety flame.
2. Change the flame to a blue flame.
3. Using tongs, hold the magnesium in the flame.
4. Record what you see.

Burning Magnesium

Aim: What happens when magnesium ribbon burns?

Page 11

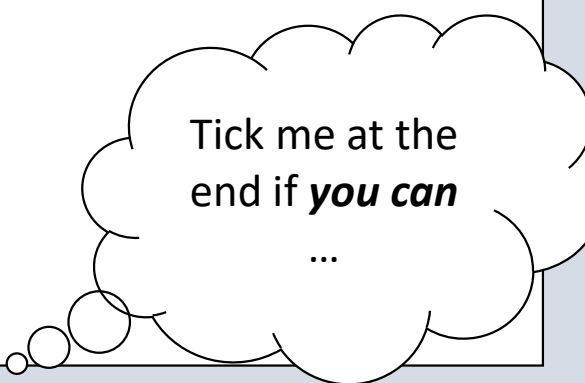
Conclusion: *What have we found out? What is the answer to the aim?*



When the magnesium ribbon burns

Success Criteria

- I can safely use a Bunsen burner to burn magnesium
- I can write an aim, method and conclusion.



Tick me at the
end if ***you can***

...

Plenary - complete one of the sentences below

I was successful when
I

A question I have
about today's lesson
is

Today I learnt
.....

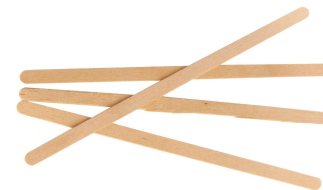
The part of the lesson
I enjoyed the most
was.....

The skills I used in
today's lesson
were.....

One thing I need to
remember from
today's lesson
is.....

Starter:

Name 3 pieces of scientific equipment you have used in science.

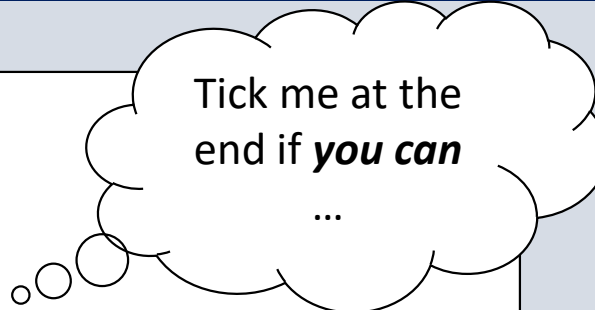


Learning Intentions:

- To use a Bunsen burner to boil water
- To state the temperature at which water boils and ice melts

Success Criteria

- I can boil water using a Bunsen burner
- I can state the temperature at which water boils and ice melts



Tick me at the
end if ***you can***

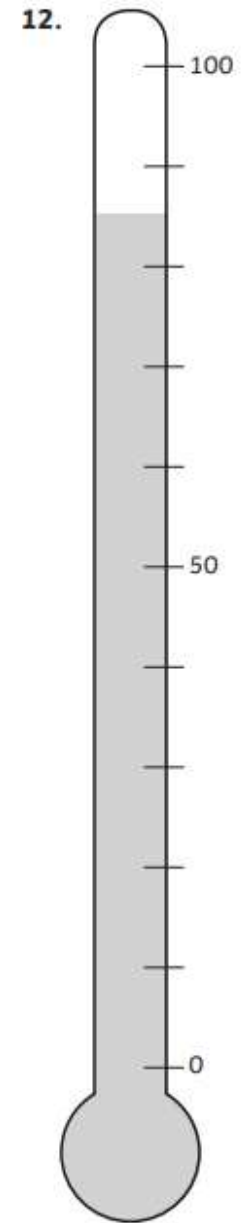
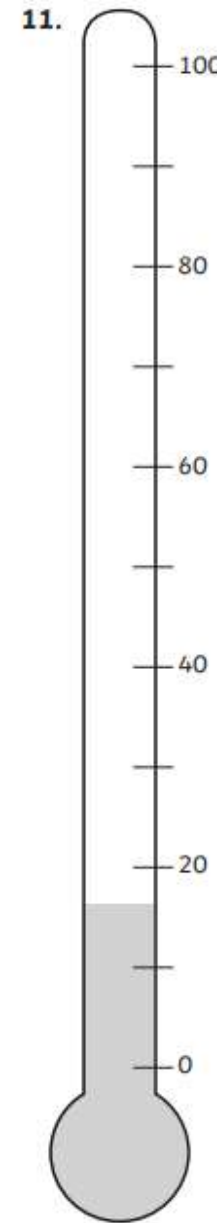
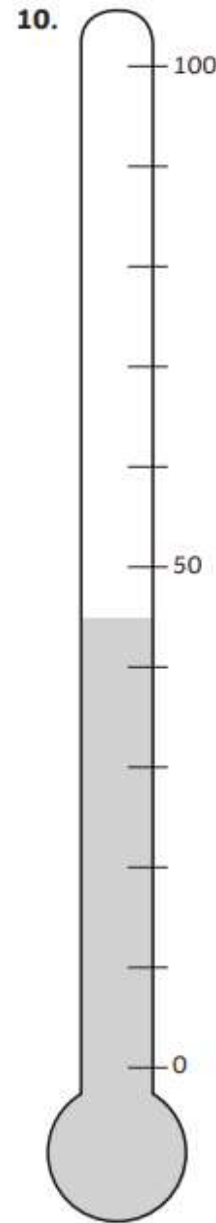
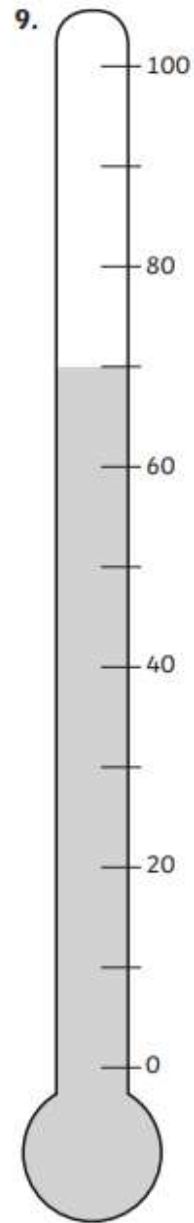
...

Temperature

- Temperature is a measure of how hot or cold something is.
- Temperature is measured using a thermometer.
- Temperature is measured in degrees Celsius (°C).



Reading a thermometer

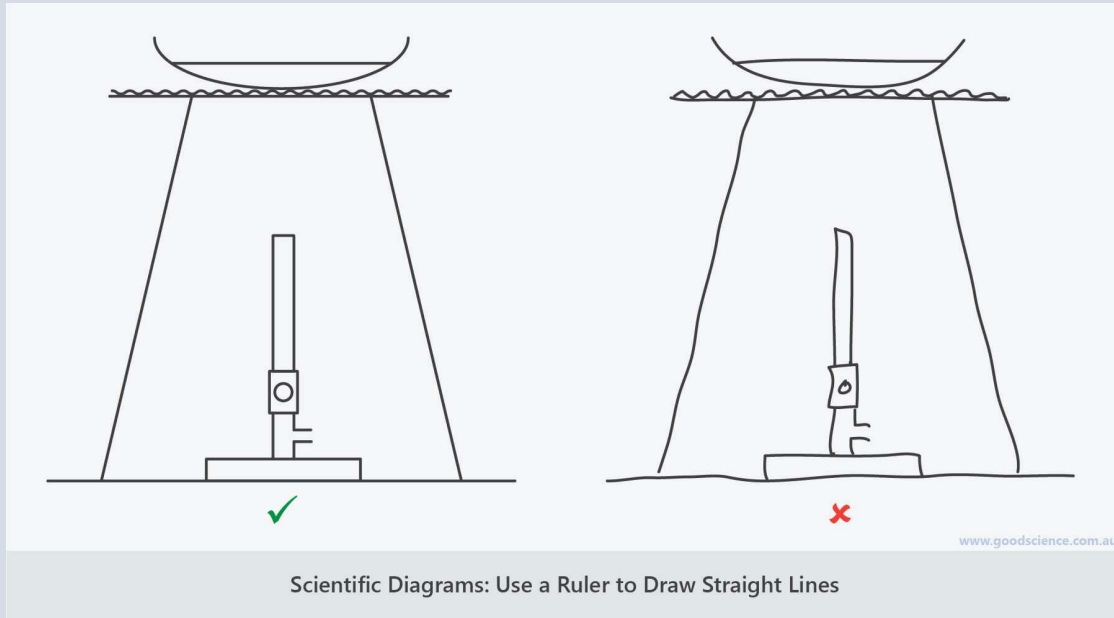


Drawing Scientific Diagrams

Scientific diagrams are a systematic way of representing scientific equipment and experiments in a simple and clear manner.

They are drawn according to a set of rules:

- Use a sharp lead pencil.
- Draw objects in two dimensions.
- Draw clean, single lines.
- Don't close off openings of glassware.
- Use a ruler to draw straight lines.
- Don't shade or colour in.
- Don't 'float' objects.
- Label objects with simple straight lines.



Boiling Water

Aim: What temperature does ice melt and water boil?

Method:

Thermometer

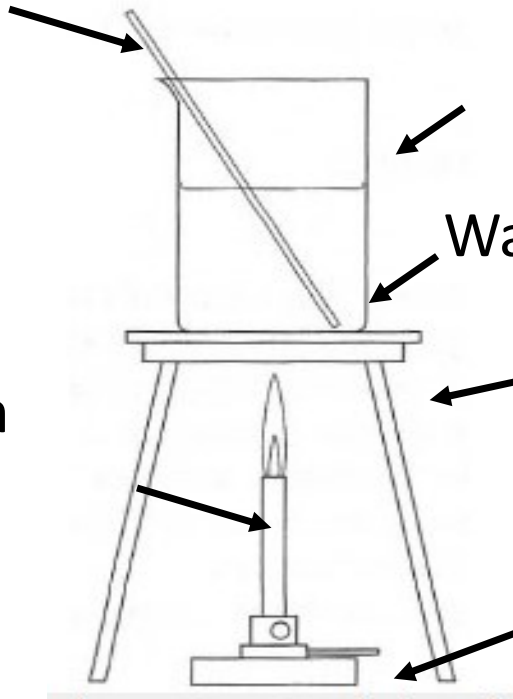
Beaker

Water

Tripod
stand

Bunsen
burner

Heat
proof mat



Boiling Water

Conclusion: _____

- Temperature of melting ice is _____
- Temperature of tap water is _____
- Temperature of boiling water is _____



Plenary:

Do all materials melt at the same temperature?



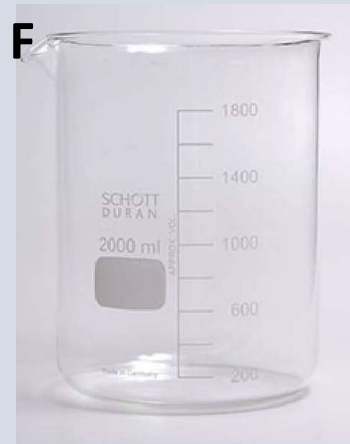
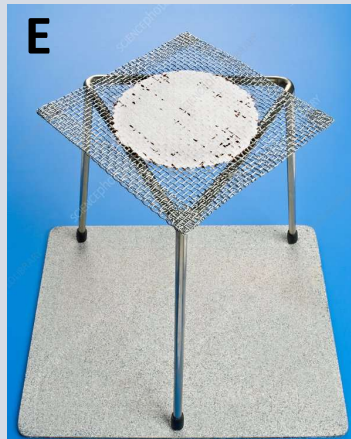
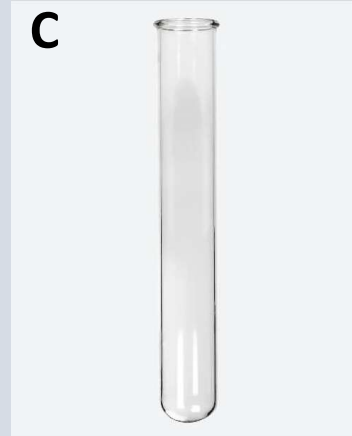
Success Criteria

- I can boil water using a Bunsen burner
- I can state the temperature at which water boils and ice melts

Tick me at the end if *you can*

...

Starter: Name the science equipment below:



Word bank:

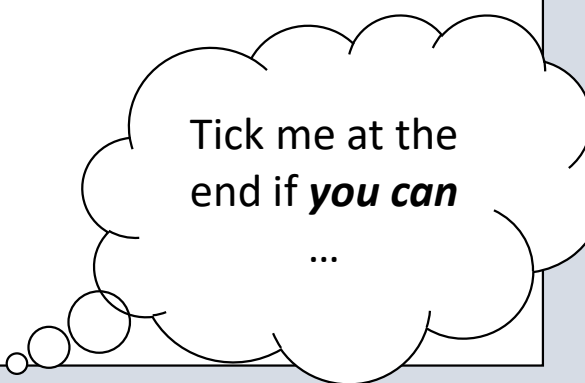
- Tripod stand
- Test tube
- Beaker
- Bunsen burner
- Heat proof mat
- Measuring cylinder

Learning Intentions:

- To identify various apparatus in the lab.
- To understand why we need to measure accurately in Science.
- To understand how to make accurate measurements.

Success Criteria

- I can identify various apparatus in the lab
- I can explain why we need to measure accurately in Science
- I can make accurate measurements



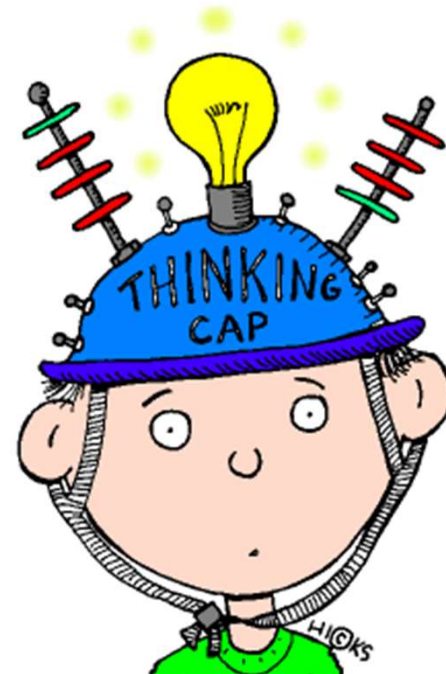
Tick me at the
end if ***you can***
...

Measuring in Science

We all make measurements in our everyday life. What do we measure?



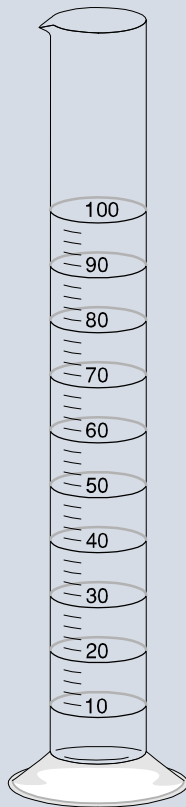
- reading the **time** from a clock
- checking our body **temperature**
- measuring the **mass** of ingredients when cooking
- filling our water bottle with a certain **volume** of water
- measuring the **distance** a javelin has been thrown in PE.



Measuring in Science

What do we measure in **Science**?

- Time
- Length
- Mass
- Temperature
- Volume



Measurements and units

Every measurement we make has a unit that it is measured in.

For example, length can be measured in millimetres (mm) or centimetres (cm).



Every measurement should include a number followed by a unit of measurement.

For example: 4.23 cm or 62 minutes

Measurements and units

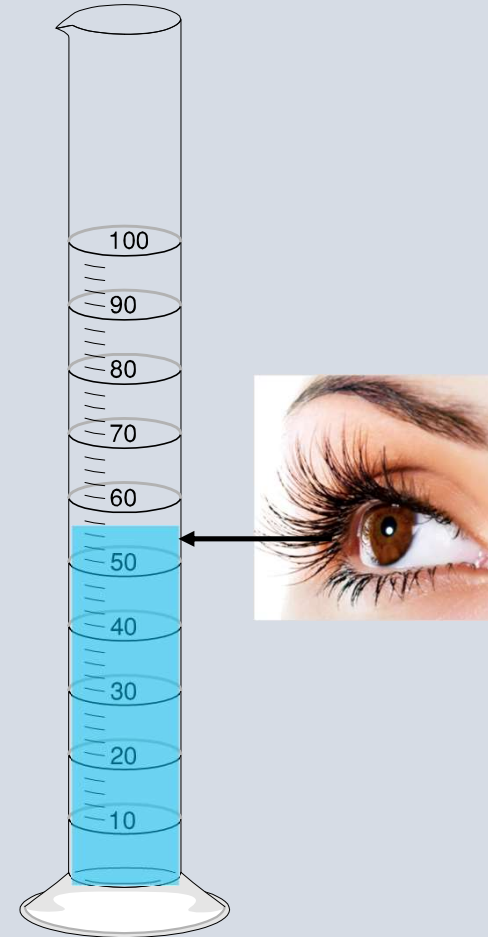
Activity: Underline the unit of measurement in each of the statements below.

1. The patient's temperature is 38 °C.
2. The sack holds 5 kilograms of potatoes.
3. It is 4 kilometres from your house to school.
4. The bottle holds 2 litres of cola.

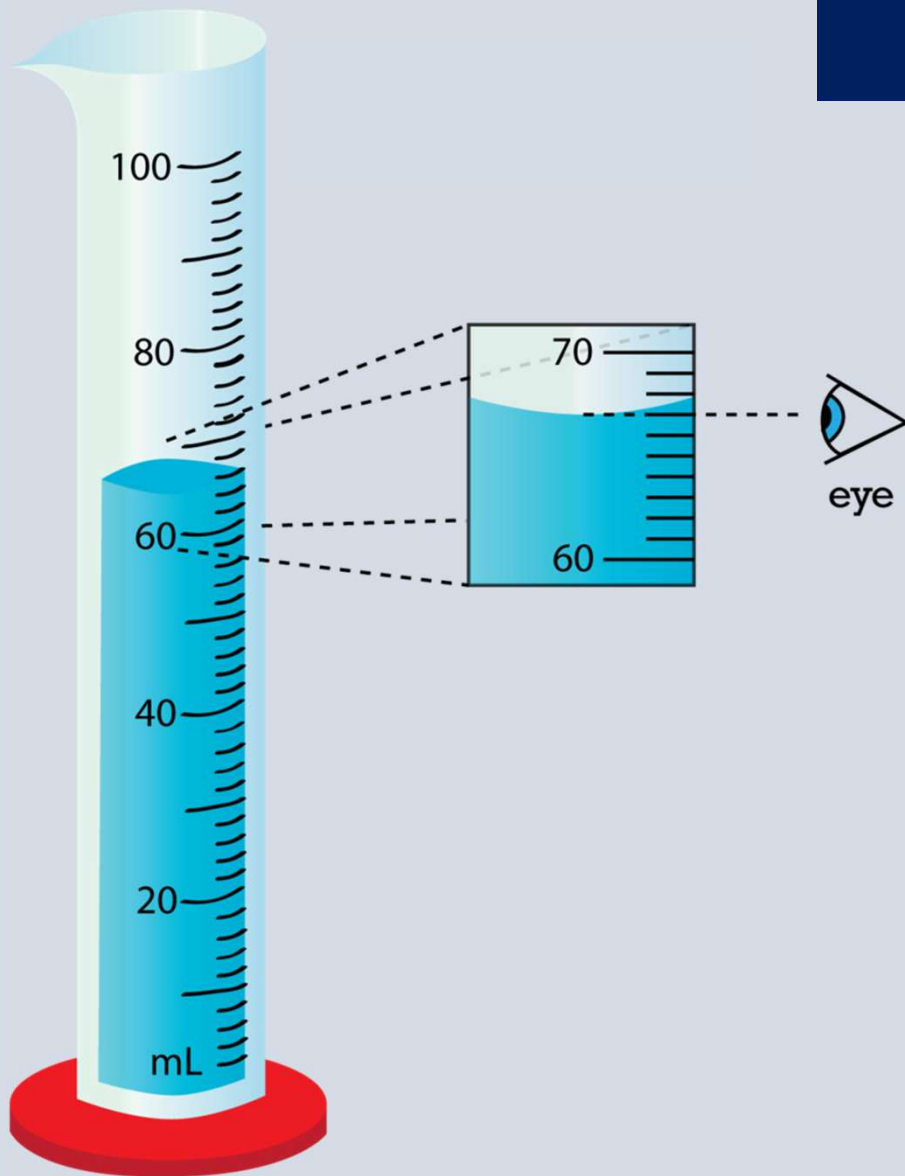


Steps for Measuring Volume

1. Take a reading by checking to see exactly what point the water reaches on the scale.
2. Try to position yourself so that you are level with the scale on the measuring cylinder – if you read it from above or below, you may not get an accurate reading.



Steps for Measuring Volume



What is the volume of water in the measuring cylinder?

Making Measurements - Activity

Aim: To make accurate measurements.

Situation	Measurement (including unit)
Hand span	
Length of desk	
Temperature of room	
Temperature of tap water	
Volume of test tube	
Volume of boiling tube	
Time taken for the ball to drop 1 metre	
Time taken to complete 5 star jumps	
Mass of a pencil	
Mass of a jotter	



Summary:

Choose the correct word from the word bank to fill in the blank.



- Length is measured in _____.
- Volume is measured in _____.
- Mass is measured in _____.
- Temperature is measured in _____.
- Time is measured in _____.

Word bank:

- seconds (s)
- cm^3
- degrees Celsius ($^{\circ}\text{C}$)
- metres (m)
- kilograms (kg)

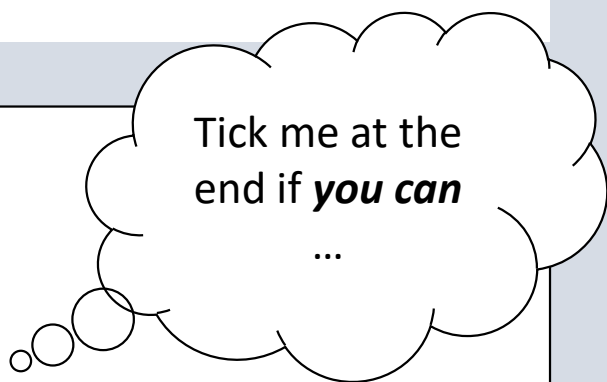
Plenary:

Think about the measurements you have made today.....

1. What was the **easiest** to measure? Explain why.
2. What was the most **difficult** to measure? Explain why.

Success Criteria

- I can identify various apparatus in the lab
- I can explain why we need to measure accurately in Science
- I can make accurate measurements



Tick me at the
end if ***you can***

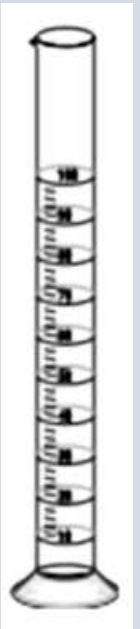
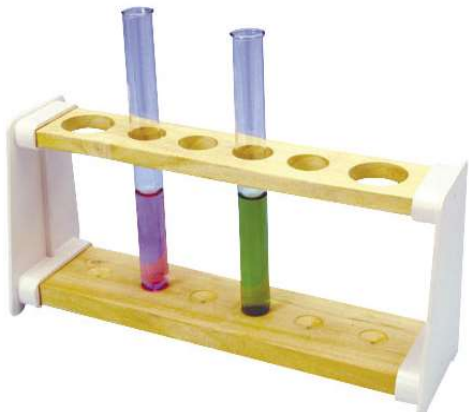
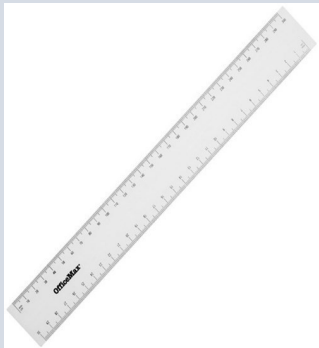
...

Measuring in Science

Extension

What's what in a lab ?

Find these pieces of equipment in the lab...



Measuring Volume - Practice

Extension

There is a measuring cylinder with water on each of your tables.

Using the skills you have just learnt, measure the volume of water in each measuring cylinder.

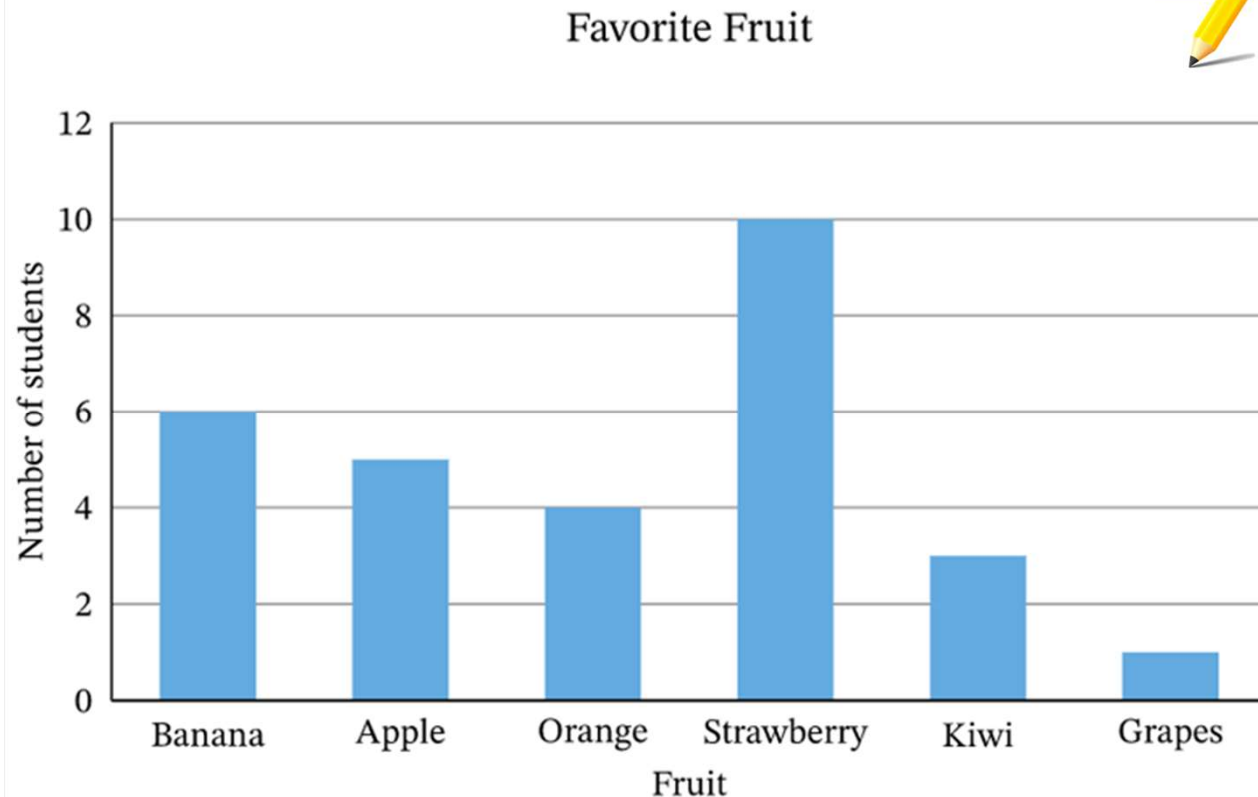
Write the answers in your jotter.





Starter:

1. How many students like apples the most?
2. How many more students like **strawberries** than apples?
3. How many fewer students like **grapes** than **apples**?
4. Which is the most liked fruit?

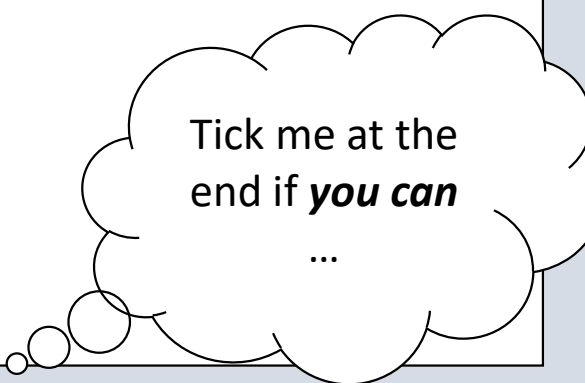


Learning Intentions:

- To correctly interpret results of a bar graph.
- To produce a bar graph from a set of results.
- To make conclusions from a set of results.

Success Criteria

- I can interpret results of a bar graph.
- I can produce a bar graph from a set of results.
- I can make conclusions from a set of results.



Tick me at the end if ***you can***

...

Bar Graphs

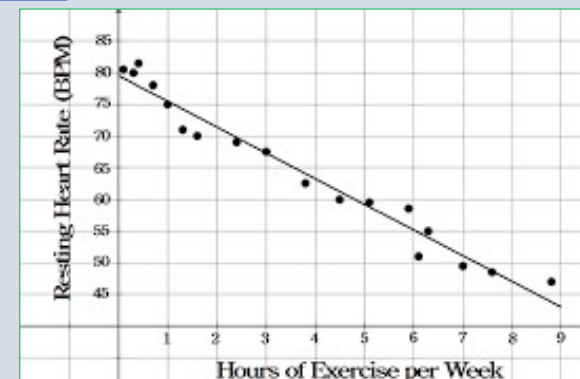
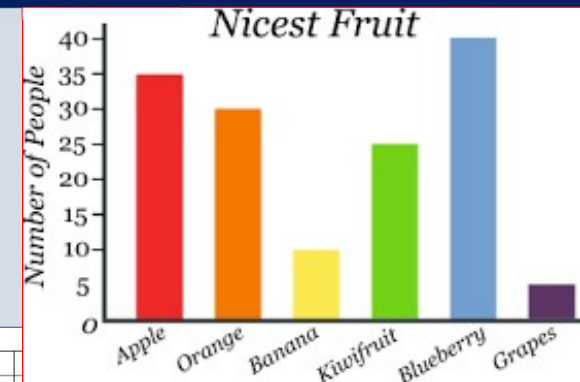
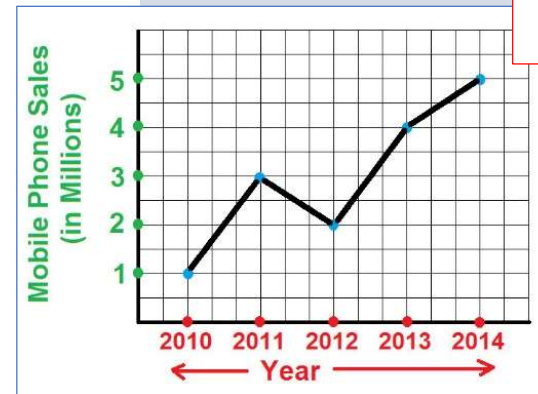


In Science, graphs are often drawn to make information from the results easier to understand.

Sometimes it is appropriate to draw a:

- **bar** graph
- **line** graph
- **scatter** graph with a best fit line

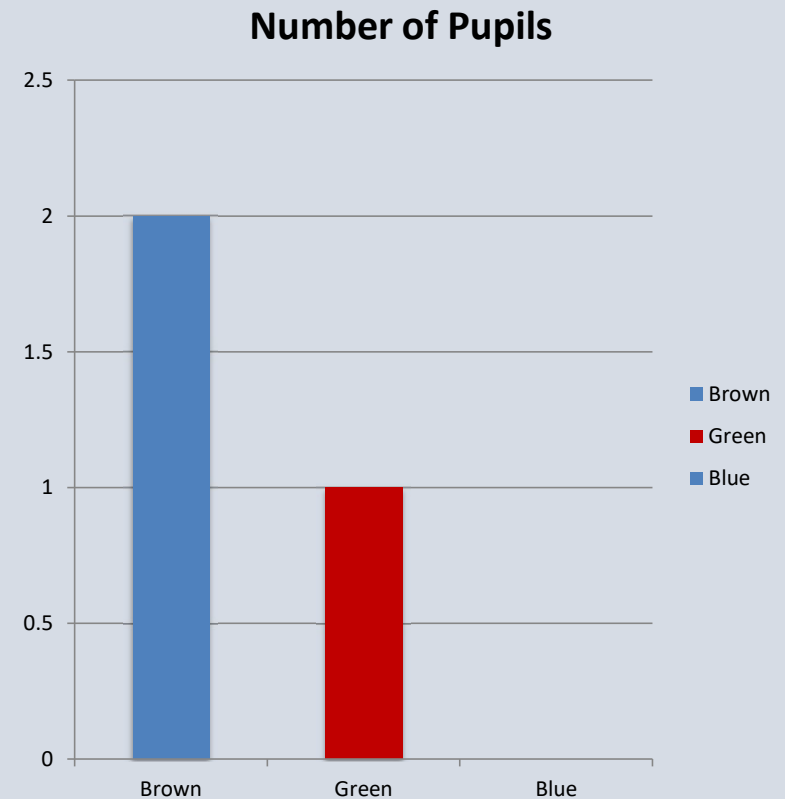
It depends on the type of information you are dealing with.



Bar Graphs

Bar graphs are used if the data can be split into clear, distinct groups e.g. hair colour.

You would use this method when the differences within the set of results can be easily observed without having to measure.



Rules for drawing graphs

- Draw your axis with a pencil and ruler.
- Choose a sensible scale for each axis. (A little bigger than the biggest number.)
- Label each axis with the units and name of what you were measuring.
- Plot the points carefully with a pencil.
- Draw a line of best fit for a line graph, colour in the blocks for a bar chart.
- Give the graph a title.

Hair Colour Investigation



Aim: To investigate the most popular _____ in class _____.

Results:

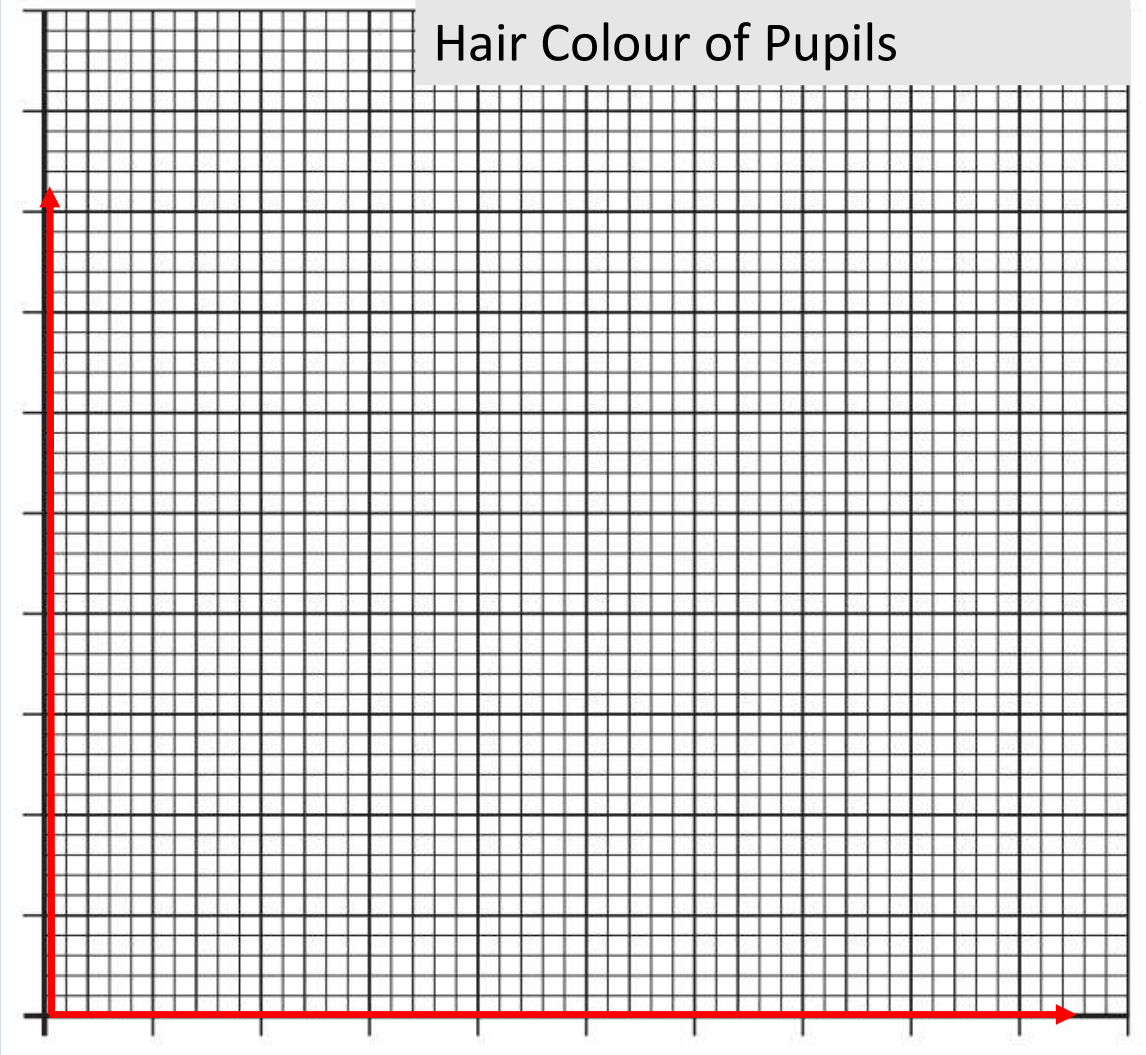
Colour of hair	Number of pupils	
	Tally	Total
Brown		
Blonde		
Red		
Black		
Other		

Hair Colour Investigation

Page 18



Number of pupils



Colour of hair

Hair Colour Investigation



Conclusion: What did you find out? Answer your aim?

Aim: To investigate the most popular hair colour in class _____.

The most popular hair colour in is

Bar Graph Practice (additional graph paper at back of booklet)

1. Louise planted seeds in her garden. Draw a bar graph of her crops.



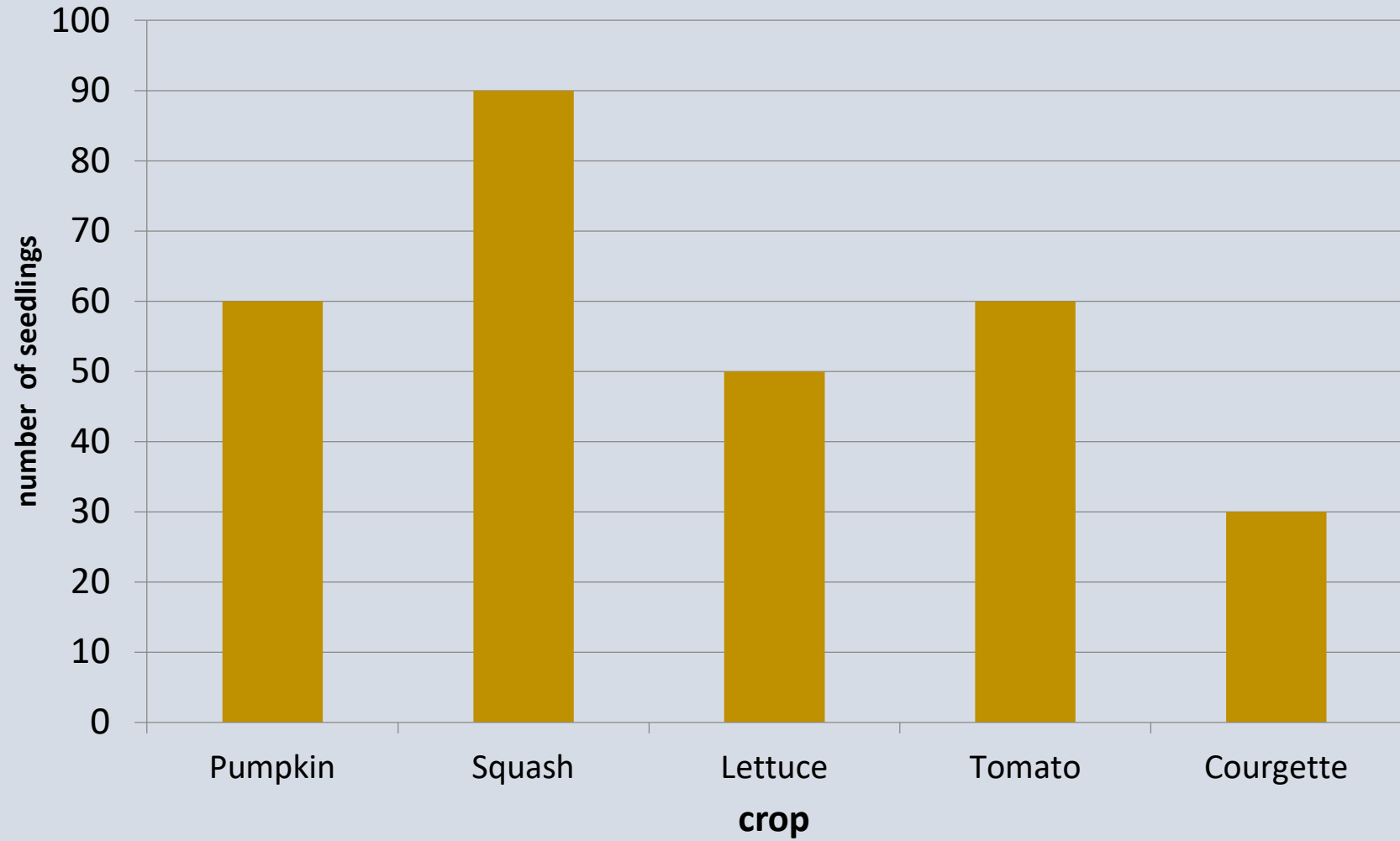
Crop	Number of seedlings
Pumpkin	60
Squash	90
Lettuce	50
Tomato	60
Courgette	30

2. A survey of pupils produced the following data for favourite after-school activities. Draw a bar graph of the data.

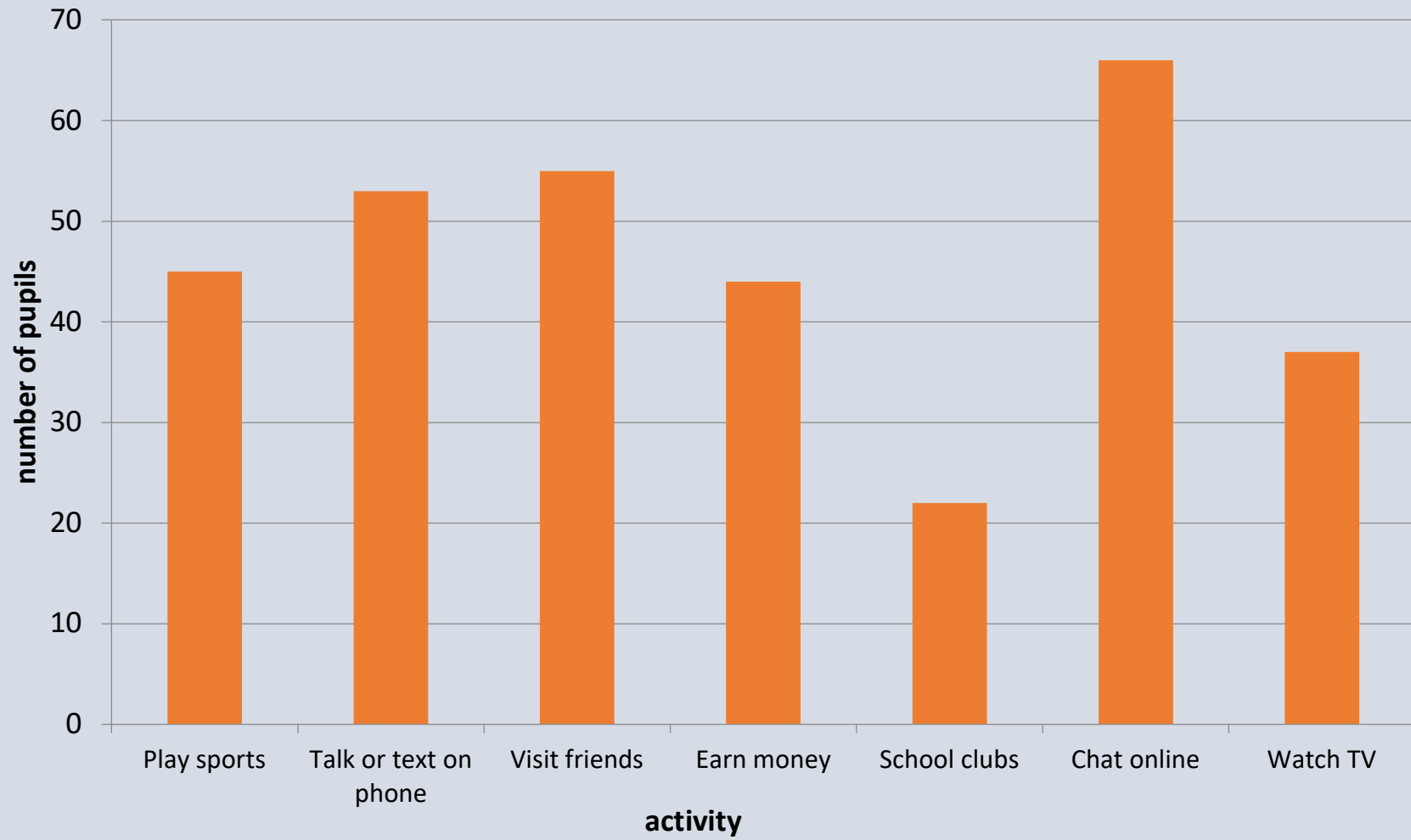


Activity	Number of pupils
Play sports	45
Talk or text on phone	53
Visit friends	55
Earn money	44
School clubs	22
Chat online	66
Watch TV	37

Successful seedlings from different crops



pupils favourite after school activities

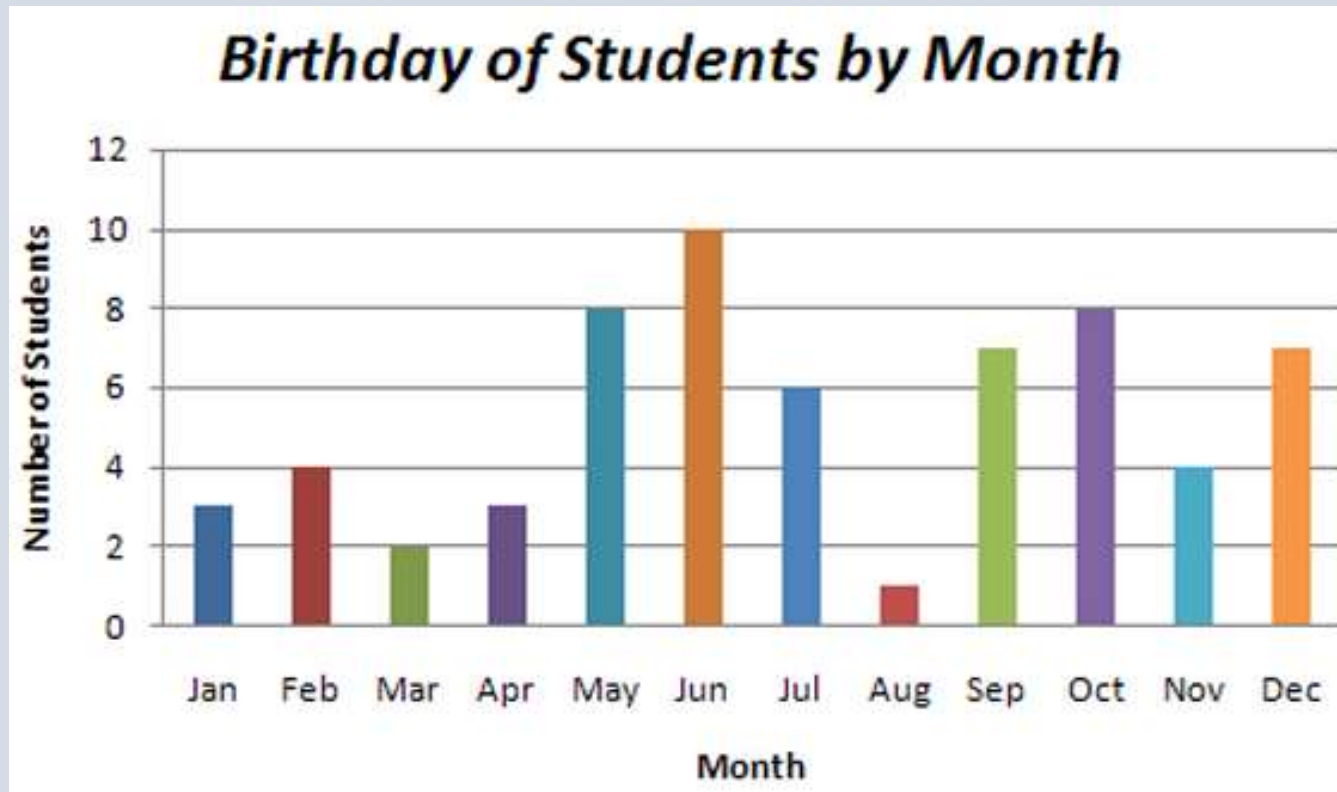


Bar Graphs

24/09/2024

Extension

1. How many students have their birthday in February?
2. Which month is the most popular birthday month?
3. How many more birthdays are there in October than in November?
4. Write your own question for someone in the class to answer.



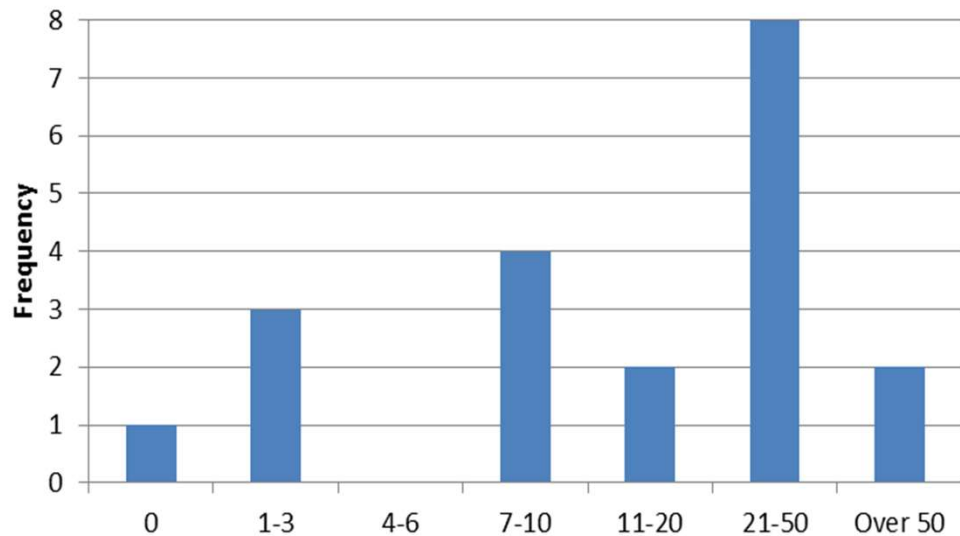
Bar Graphs

24/09/2024

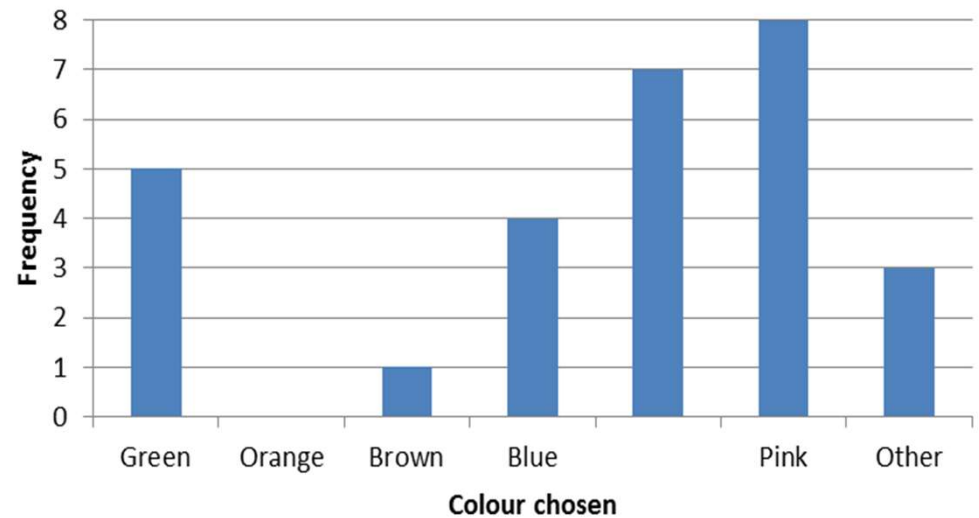
Extension

Spot the mistakes on the bar graphs below.

Daily texts sent

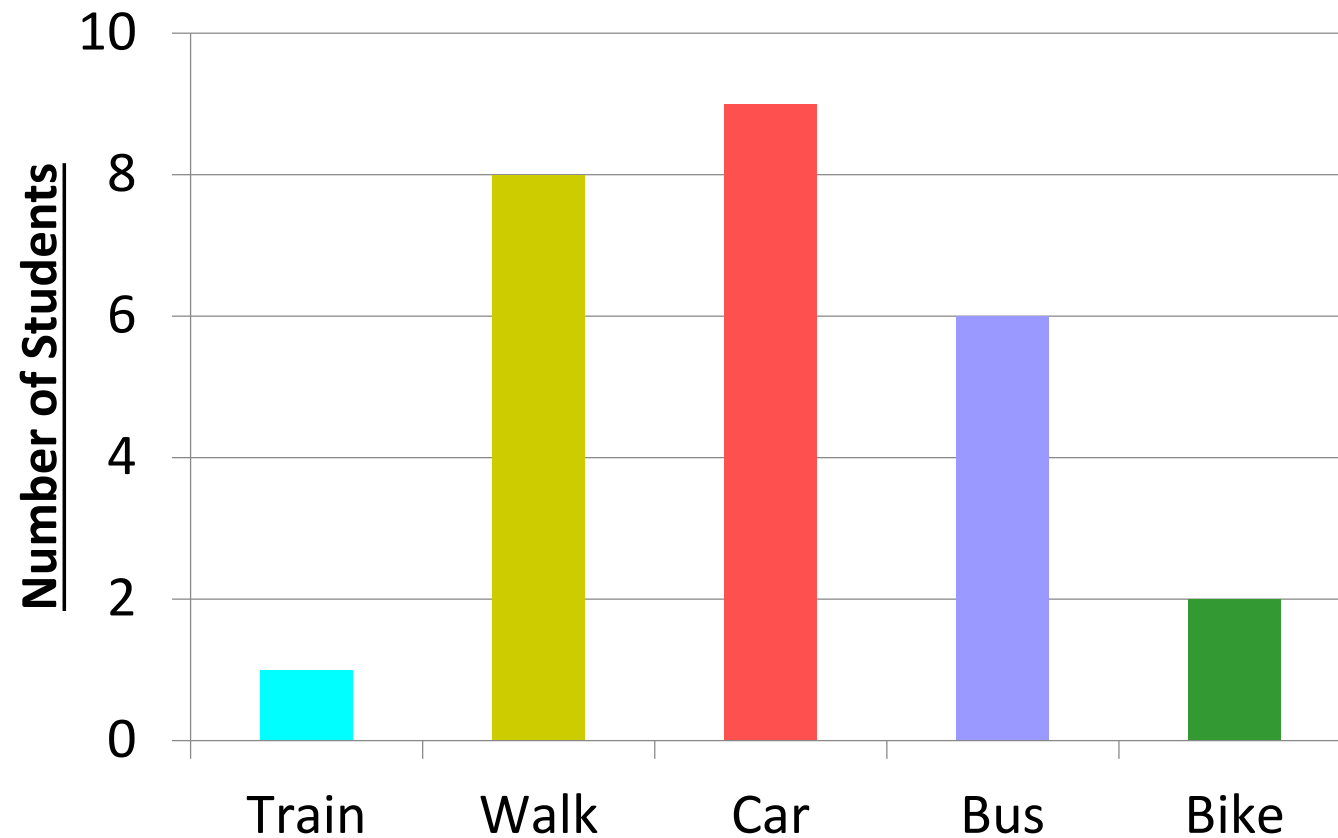


Favourite colours



What questions could we ask about this graph?

Write down 3 questions and answers.



Plenary: complete one of the sentences below

I was successful when
I

The skills I used in
today's lesson
were.....

One thing I need to
remember from
today's lesson
is.....

Success Criteria

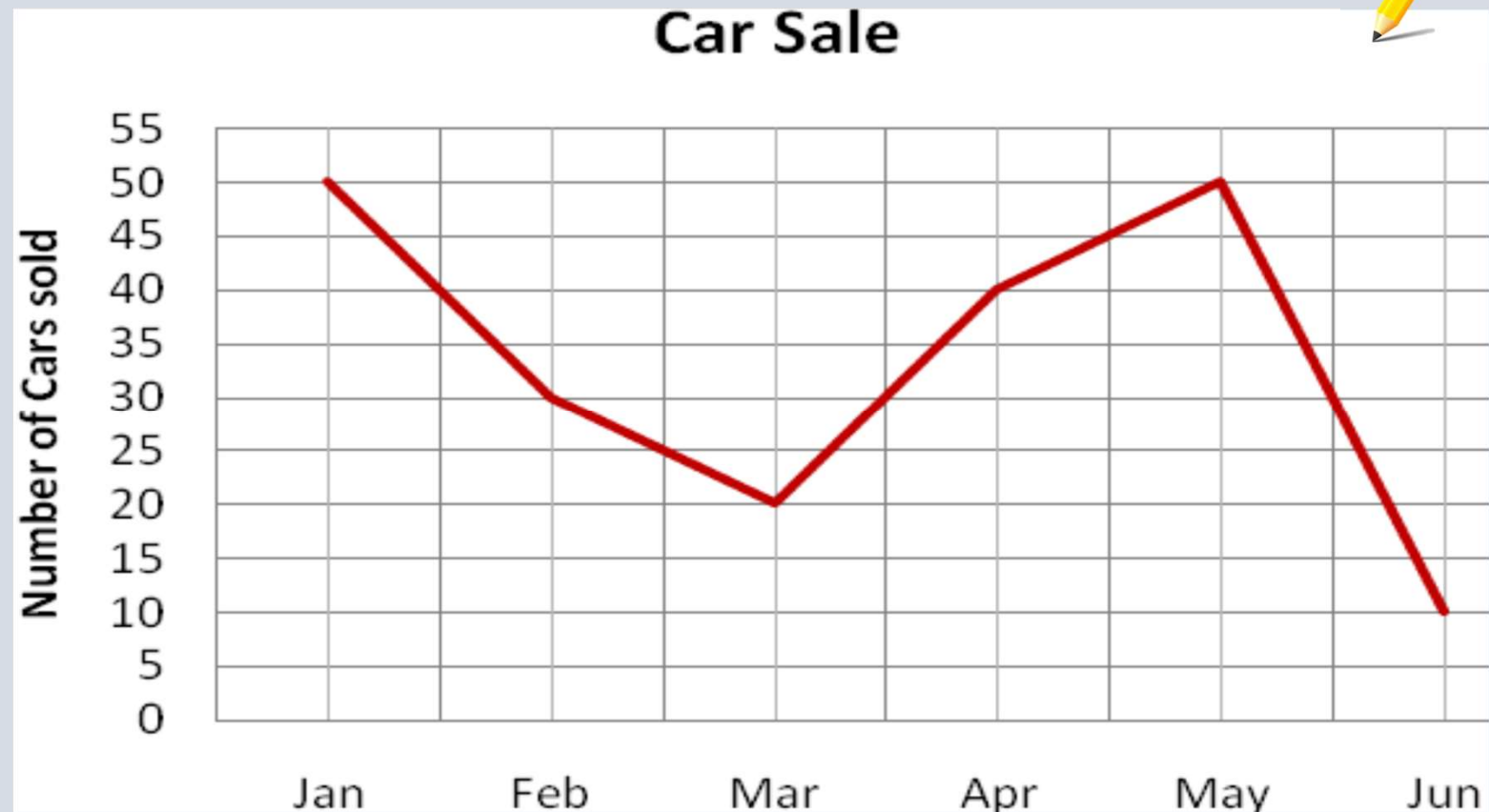
- I can interpret results of a bar graph.
- I can produce a bar graph from a set of results.
- I can make conclusions from a set of results.

Tick me at the
end if ***you can***

...



1. How many cars were sold in April?
2. In which two months were the same number of cars sold?
3. What is the difference in number of cars sold in the months of March and June?

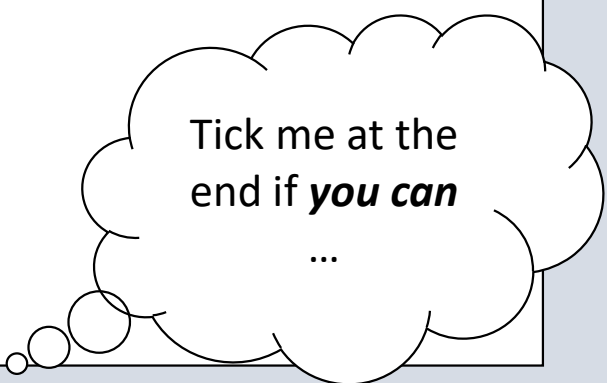


Learning Intentions:

- To understand and identify variables in any experiment.
- To understand ways to control variables in any experiment.
- To investigate how quickly hot water cools.

Success Criteria

- I can identify variables in an experiment
- I know ways to control variables.
- I have investigated how quickly hot water cools



Tick me at the
end if ***you can***

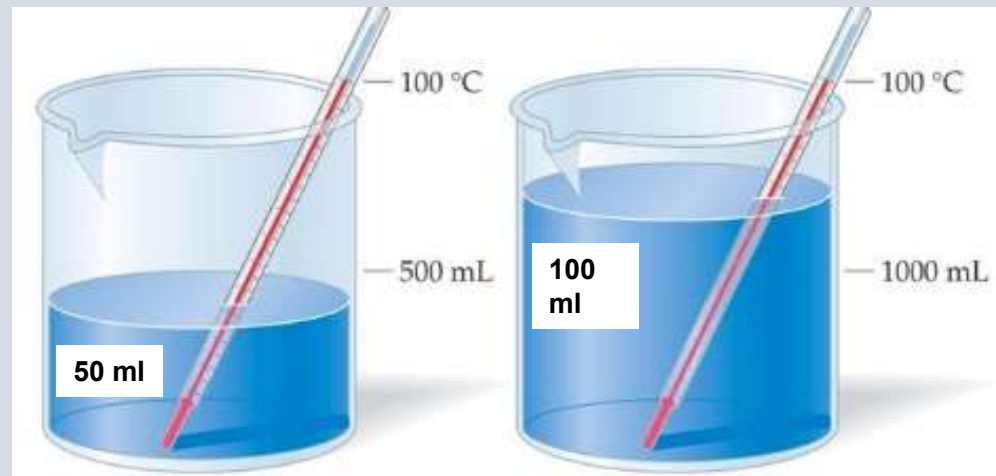
...

Investigating Cooling

Aim: To investigate how changing the **volume** of water affects how quickly water cools down.

We are going to use two beakers, each with a different volume of boiling water.

We are going to see if there are any differences in how quickly the water cools down.



Investigating Cooling



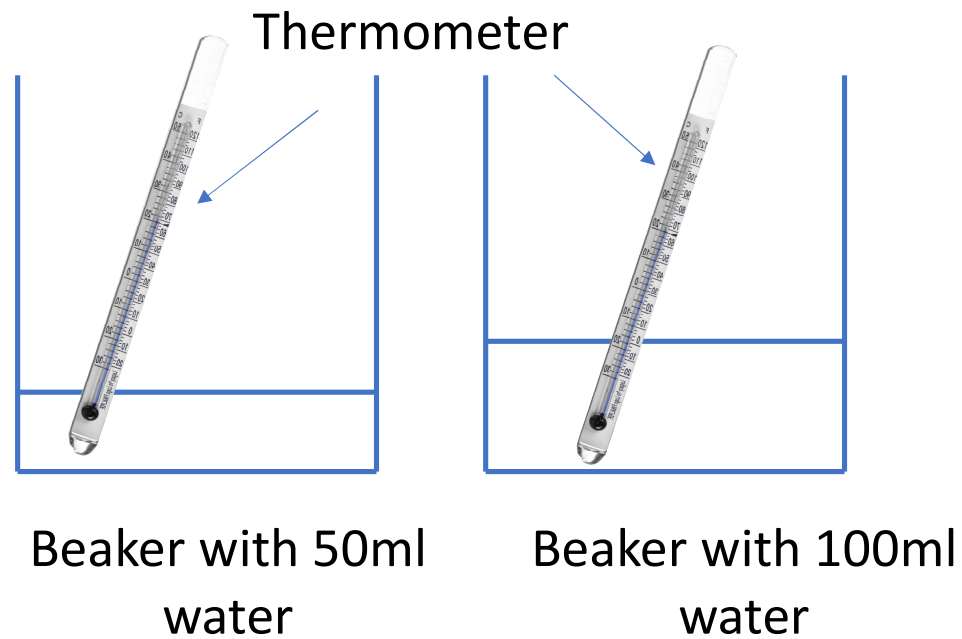
Method:

1. Carefully pour 50 ml of water into beaker 1
2. Carefully pour 100 ml of water into beaker 2
3. Place a thermometer into each beaker, leave for a few seconds and take the temperature – write this in your results table
4. Use the stop clock to record the temperature of the water in both beakers every 2 minutes.

Investigating Cooling



Method:



Investigating Cooling

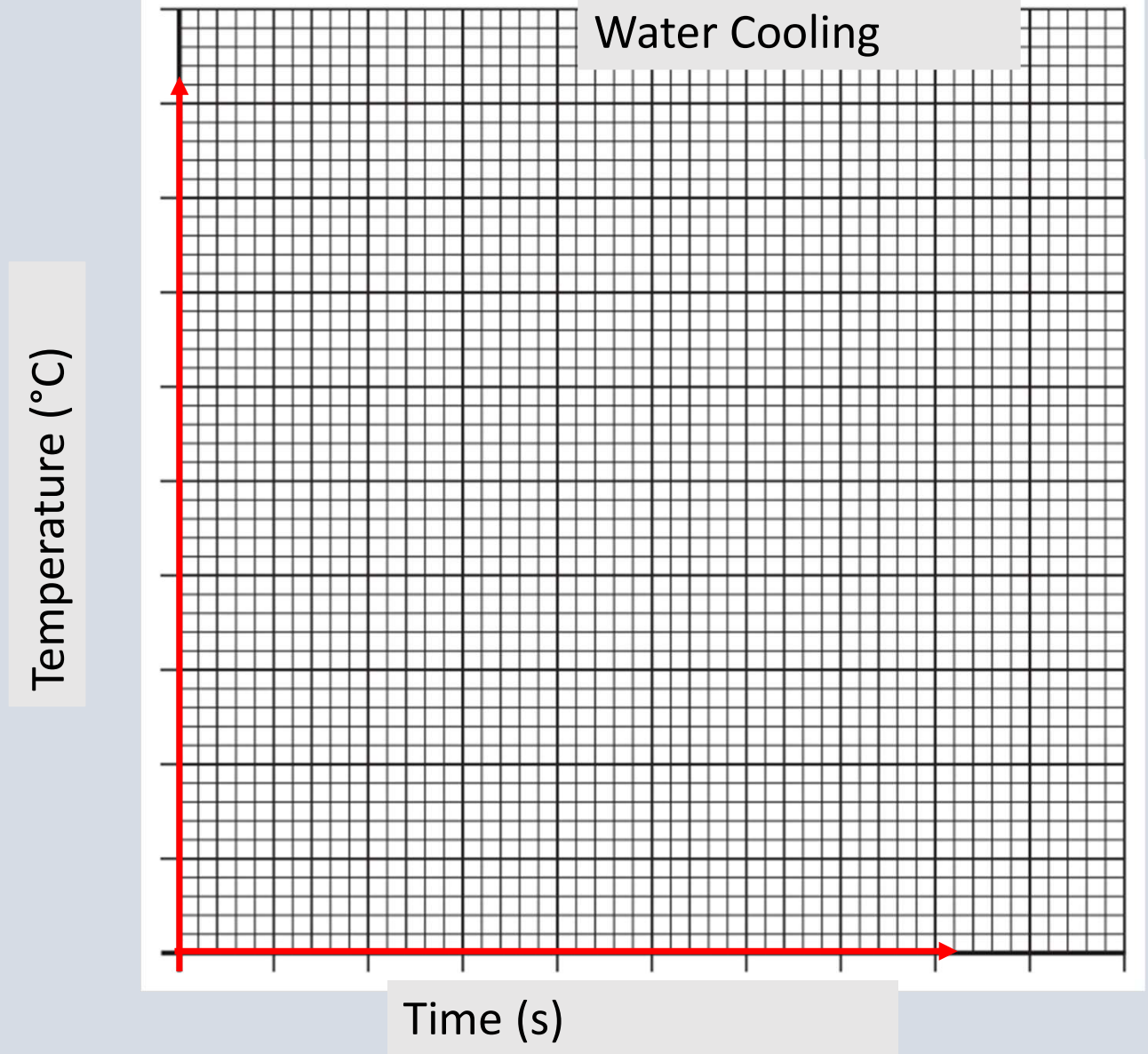


Results:

Time (minutes)	Temperature (°C)	
	Beaker 1 (50ml)	Beaker 2 (100ml)
0		
2		
4		
6		
8		
10		
12		
14		
16		

Plot a scatter graph of your results.

Plot **both** lines on the same axis.



Investigating Cooling



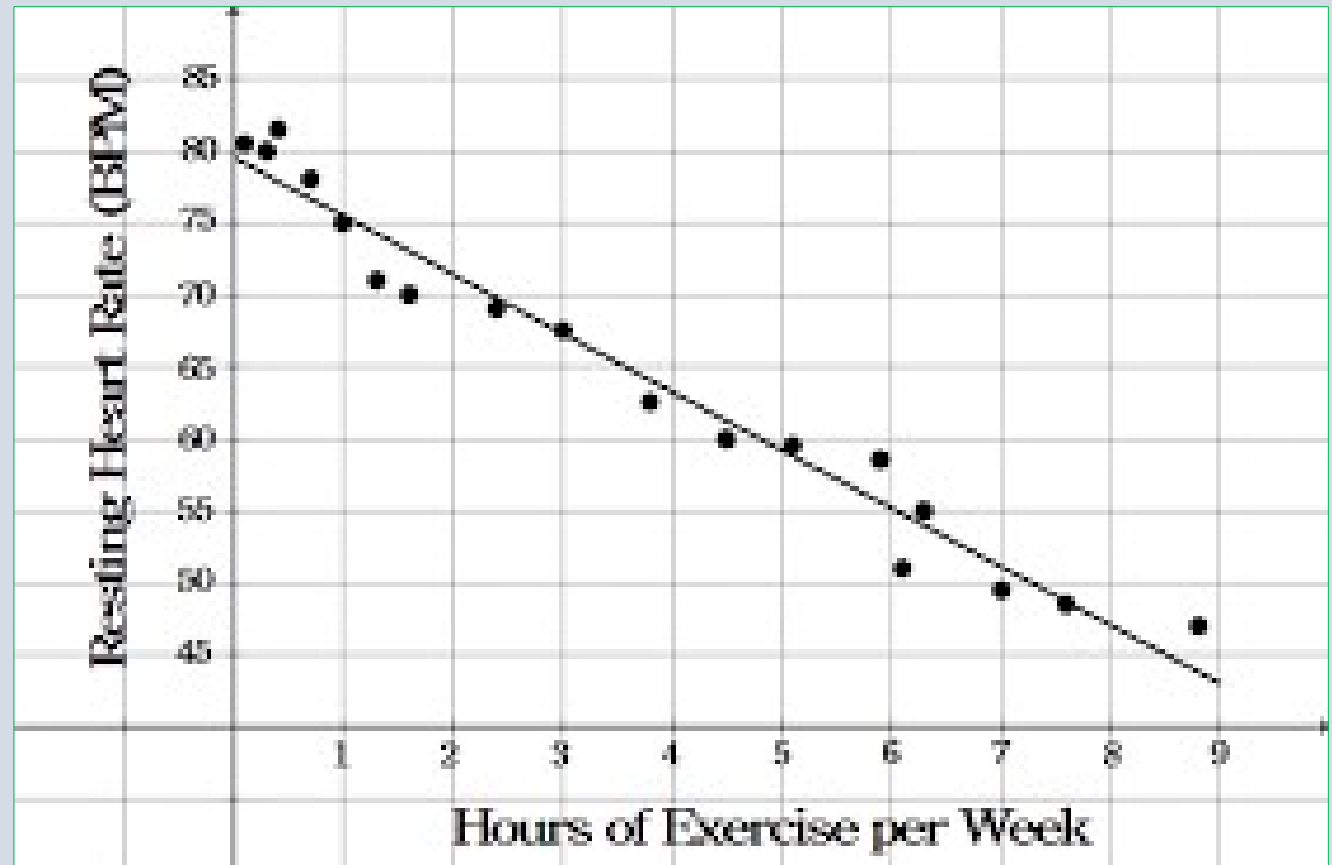
Conclusion: *answer you aim*

Aim: To investigate how changing the volume of water affects how quickly water cools down.

The beaker with _____ml of water cooled down quicker than the beaker with _____ml of water.

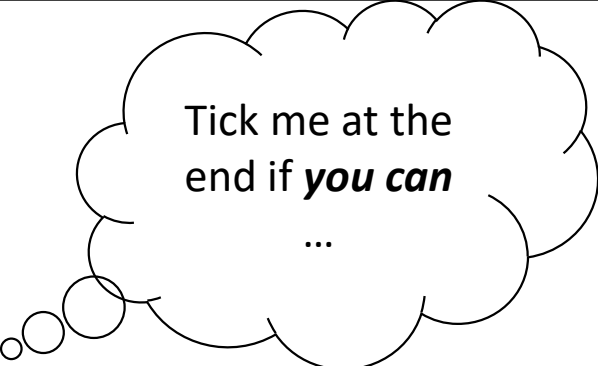
Scatter Graphs

A graph of plotted points that show the relationship between two sets of data. A line of best fit is often added to identify trends in data.



Success Criteria

- I can identify variables in an experiment
- I know ways to control variables.
- I have investigated how quickly hot water cools



Tick me at the end if ***you can***

...

Scatter Graphs Practice

Solar power is a renewable energy source of energy. The table below shows the voltages produced by a solar cell when the light of different intensities is shining on it.

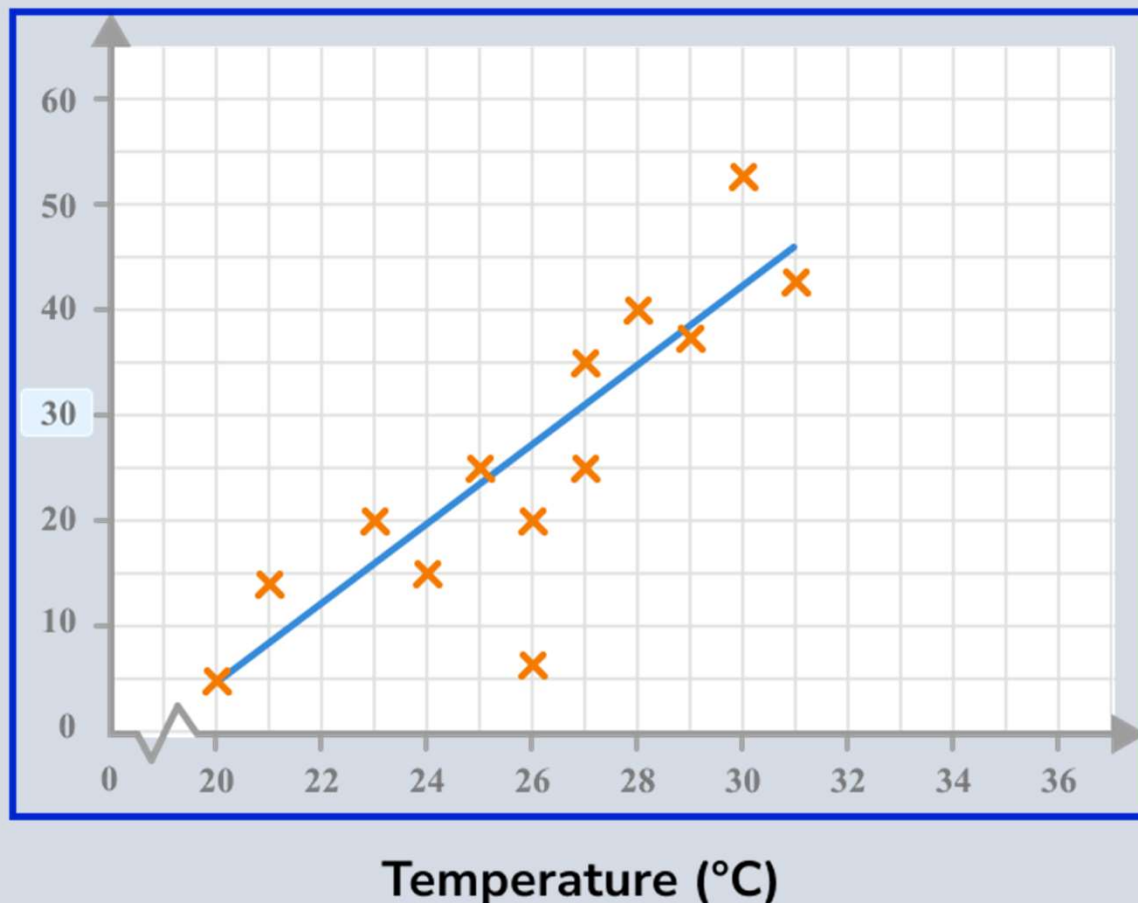
Light intensity (units)	Voltage (mV)
0	0
20	7
40	14
60	21
80	28
100	35

Bar Graphs

24/09/2024

Extension

A scatter graph showing the number of ice cream sales and the temperature at midday



What **trend** does this graph show?

A trend describes the general direction of change over a period of time – a pattern of results.

- Increase
- Decrease
- Stay the same

Extension Tasks

Try the extension tasks on pages 25-30.

Plenary:

Congratulations! You have now completed “An Introduction to Science”. Think about the whole topic and complete one of the thoughts below.

The part I enjoyed the most was.....

One thing I need to remember is.....

I was successful when I

Expectations and Outcomes Learner Evaluation

• **Topic:** Introduction to Science

Page 2

Experience and Outcomes	Date Completed (dd/mm/yy)	Evaluation How happy are you with it? (☺ ? ☹)
I can identify the dangers of working in a Science classroom.		
I can keep the laboratory a safe environment.		

Plenary - complete one of the sentences below

I was successful when
I

A question I have
about today's lesson
is

Today I learnt
.....

The part of the lesson
I enjoyed the most
was.....

The skills I used in
today's lesson
were.....

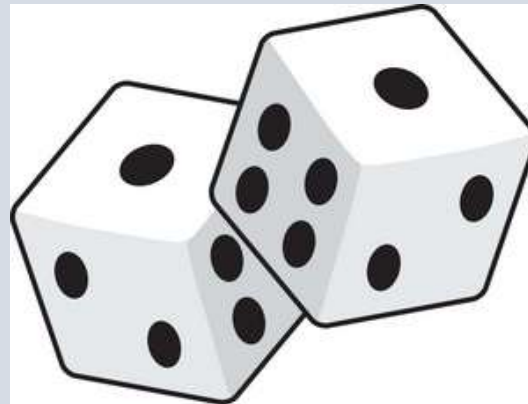
One thing I need to
remember from
today's lesson
is.....

1. Write down everything that you can remember from this lesson.

The Plenary Dice

4. Write a question regarding today's lesson, then you may get to choose someone to answer your question.

2. Write down two things you want to know more about



5. Describe this lesson in 5 words

3. You will be given a key word, you must write everything you know about this word.

6. Name a skill that you have used in this lesson.

Plenary:

List 3 things you found out/learnt today

List 3 things your neighbour has learnt today

60 second challenge – sum up knowledge of text, or write down all the words you can think of to describe...

The answer is XYZ – now write the question. N.B. the question must begin with the words ‘What is...’

Spot missing words in cloze summary of learning

True or false – hold up card/whiteboard to show whether statement on OHT is true or false

Change role – student as teacher. What questions would you ask the class and why?

Getting to know you

Spin the colour generator and answer **one** question about yourself from the table below.

Colour	Choose a question		
Purple	What is one of your hobbies?	When is your birthday?	What was your favourite part of today?
Blue	What is your favourite book?	Do you have any brothers and/or sisters?	What is your favourite subject in school?
Green	What's your favourite TV show/movie?	Do you have any pets? What kind?	What job would you like to do in the future?
Yellow	What's your favourite colour?	If you could have a super power what would it be?	What is your favourite memory from last school year?
Red	What's one of your favourite foods?	If you could travel anywhere, where would it be?	What did you enjoy doing this summer?