Writing your

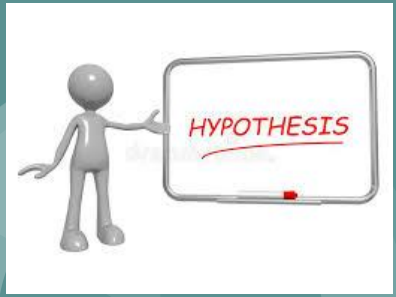


- Your Aim is a question that you want to find the answer to.
- Turn a demonstration idea into a question
  - What would happen if.....?
  - How does.....affect.....?
  - What effect does .....have on .....when.....?

- Your entire project is LEAD by you answering your Aim.



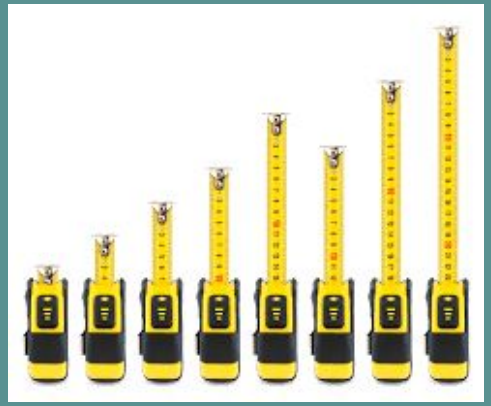
Hypothesis Writing



- When you write a hypothesis think about possible ideas from your lives or TV or websites or articles you have read.
- Ideas can be found in advertising.
- Ideas can be found talking to family or friends.
- Ideas can be found in the method.
- Ideas can often be found in **previous experiments** you have done.

Do not worry if your hypothesis is not correct…it is your educated guess as to what you will discover from the experiments











How to observe in science

The way to get the most information out of your experiment









Measuring & Instruments

- We use the metric system: Metres, Grams, Celcius, Litres/Metres^3, and Newtons for length; weight; temperature;volume and force
- We repeat our measurements if possible for at least 5 times for reliability
- We often average our results to look for a trend
- Be precise with your measurement
- **Listen to instructions on how, when and where to measure**

We use the following to measure results

- Thermometers
- Newton meters
- Multimeters (Volts, Amps, Ohms)
- Rulers
- Stop watches
- Beakers
- Measuring cylinders
- Protractors
- pH indicator paper
- Nitrate/Nitrite indicator paper
- Radiometers
- Electronic Weather Station

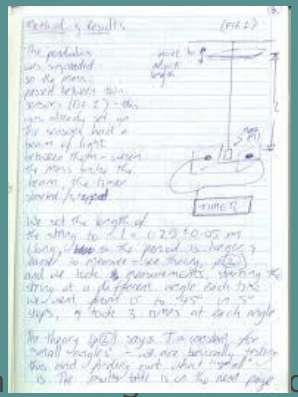
At home

- Use kitchen scales and measuring cups/spoons
- Apps from your device (often free) such as lux, dB, altitude, speed,distance, heart rate, electro-magnetic frequency, vibration, tuner.
- DIY tools
- Make your own measuring device from utube such as seismograph, anometer, moisture detector

Record everything you observe

- **Don’t rely on your memory**
- Write down **ALL** results. Preferably in your logbook.
- Draw diagrams/ infographics if that helps. Include video or photos too.
- If you are working with others, have a recorder and then get their notes ASAP.
- Record as much detail as possible. Keep anecdotal notes too such as; anomalies, problems, weather, equipment malfunctions. It helps with writing the conclusions.
- LISTEN or READ the INSTRUCTIONS carefully. If you are unsure seek advice.







Presentation of Observations

- Written results
  - In paragraphs DESCRIBING (not explaining) what happened

- Tables (Titled, labelled; axis labelled, measurements used)
  - Traditional static

- Graphs (Titled, labelled; axis labeled with measurement)
  - Traditional static

  - Do choose the correct type of graph
    - Line over time
    - Bar/histogram for most others
    - Pie ONLY when only describing things in % using 100% data
- Photos with or without captions but labelled
- Diagrams (titled and labelled)

Descriptor Words that can be used

Smell	See	Taste	Hear	Feel
•Acrid •Sweet •Cloying •Sharp •Faint •Pungent •Bitter •Eye watering	•Faint •Transparent •Translucent •Colourful •Dull •Slow •Fast •Still •Trembling •Moving •Milky •Red,green ect. •Whispy •Solid •Breifly •Some action	•Sweet •Salty •Bitter •Acrid •Faint •Metallic •Soapy •Acid	•Faint •Loud •Pop •Hiss •Roaring •Bubbling •Metallic •Clang •Sparky •Rumbling	•Temperature (very, moderately, slightly, faintly) •Movement •Wind •Rumbling •Vibration

Write & Draw your Observations Carefully

The neater the work, the easier it is to understand.

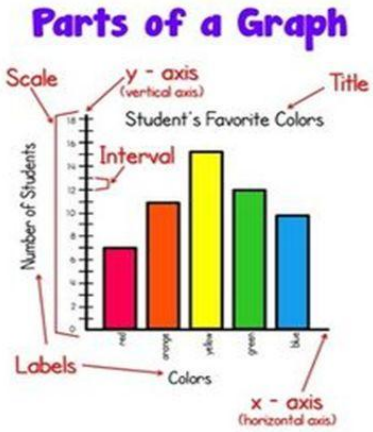
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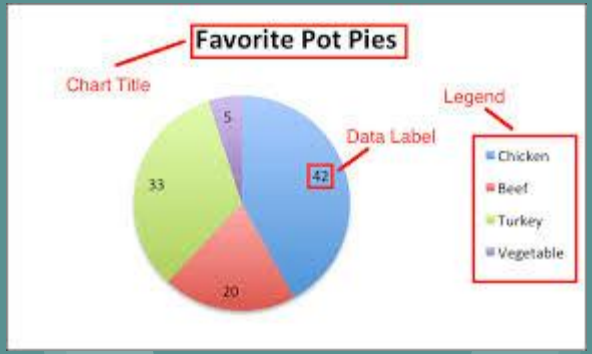
The better mark you will get.

- Write down ALL results using full sentences. COMPLETE the observation in the sentence or paragraph.
- Draw neat diagrams with labels if that helps describe what you observe
- If doing group work, have the group share ideas and details
- Record as **much detail** as possible. It helps with writing the conclusion.
- The observations (Results Section) only has what you objectively observed, **NOT** what you think happened!
- Have you recorded all of the observations from all of your senses or instruments.

Parts of a Graph

- Title
  - Summarizes information bing represented in ANY graph.
- Independent Variable
  - Variable controlled by the experimenter. Placed on X axis.
- Dependent Variable
  - Variable directly affected by independent variable. Placed on Y axis.
- Scales
  - Tells you where to plot data points.
- Legend
  - Describes the graph's data.





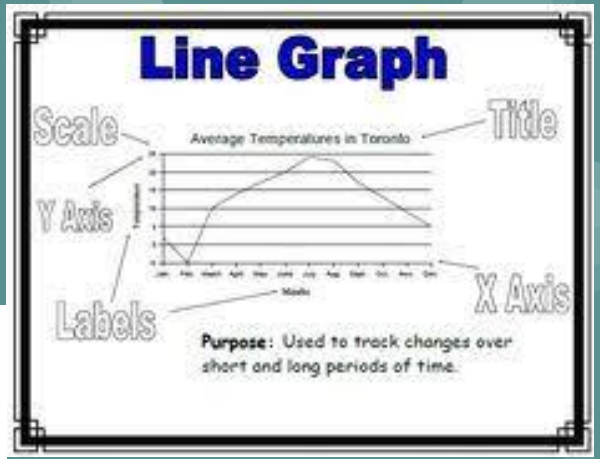


Table 7.1 : Different Parts of a Table

(i) Table Number. (ii) Title.

	1	2	3	4	5
		(v) BODY			

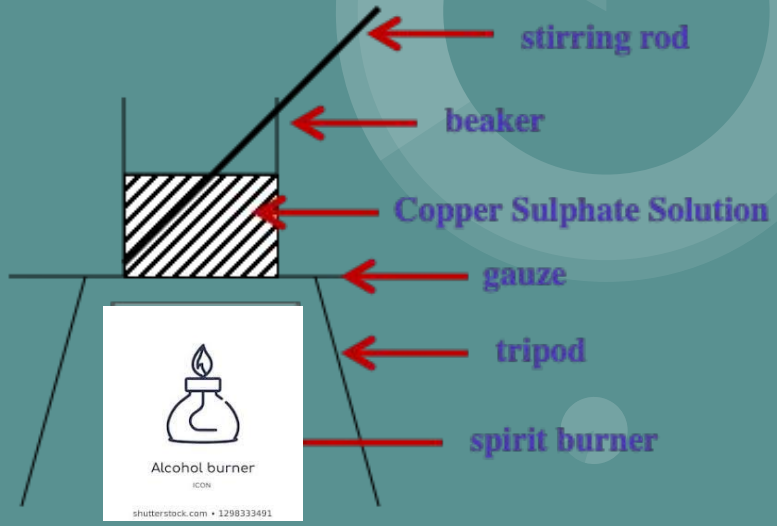
(iii) Stub (iv) Caption

(vi) Footnote, if any. (vii) Source

Title: How Do We Get to School?		
Categories	Tallies	Total
Walk	𝍸 ||	7
Bike	|||	3
Car	||||	4
Bus	𝍸 𝍸 ||	12

Chemistry Figure





A Good 4 Point conclusion Contains

- Points about the hypothesis
- Summary of Results
- Science explanation
- The meaning of these results to some application or science theory

Hypothesis

- Were your hypothesis correct?
- If not what was the correct idea?

Summary of the Results

- In a paragraph **describe** the main **observations** you have found
- The summary of observations will lead onto your discussion of the science and applications in our lives.
- Keep to descriptive writing, do not interpret the results here, that's for the next section.
- Mention any trends in the data. What do the averages indicate?
- Keep it short but with ALL of the information needed

The *Science* behind the Results

- Explain the **HOW, WHERE,WHY & WHEN** for the results
- What do scientists believe has happened?
- Is there a particular Science Phenomena being explained?
- Is it similar to what happened in previous experiments/lessons?
- What are your ideas about how this happened?
- What does the class or teacher suggest?
- What do posters, books or the intranet/internet suggest?
- Use diagrams if they help with your explanation, that's what scientists do.

Make your explanation clear and detailed

- Do refer back to photos, videos, tables and graphs
- You can include a movie/slideshow that you make explaining the science and/or application (with or without written/audio captions) BUT this is an optional extra and is in addition to your board.

The Applications in our lives and the World

- Give examples from our lives where the science ideas from the experiments are used in our lives:- why, where and how
- Where else in the world have these ideas been used and why?
- What are the benefits of this science and technology?
- What are the problems and solutions of this science and technology?
- What does the class or teacher suggest?
- What do posters, books or the intranet/internet suggest?
- Use diagrams if they help with your explanation, that's what scientists do.

Make your examples clear, relevant & detailed

- Do refer back to photos, videos, tables and graphs
- You can include an optional **video**/slideshow that you make explaining the science and/or application (with or without written/audio captions separate to your board

Created by John Mayo, Tauranga Intermediate School