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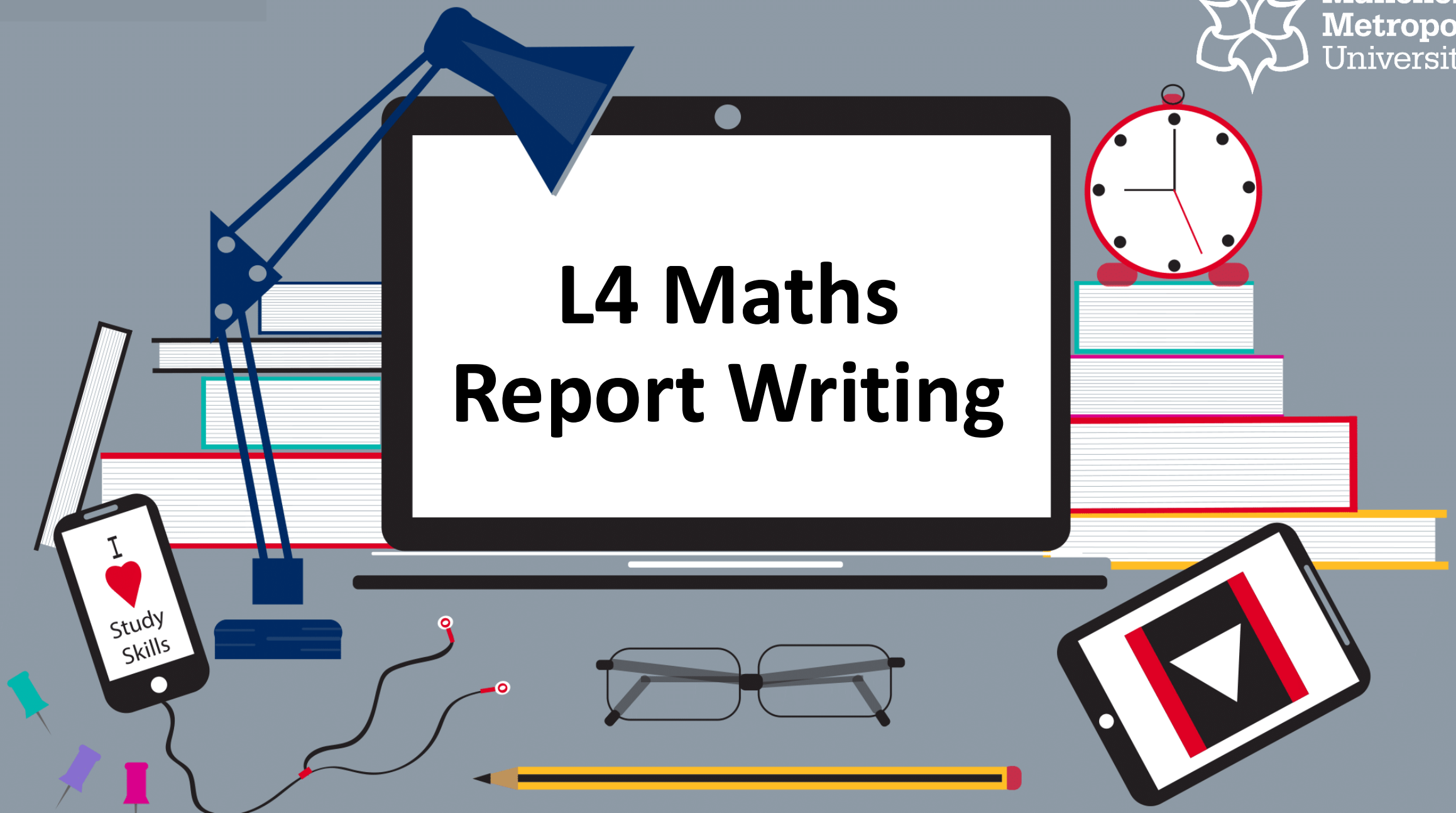
L4 Maths Report Writing



Learning Objectives

By the end of this session you will have:

1. Explored some key considerations of working in a group.
2. Discussed key aspects of report presentation and structure.
3. Analysed sections of an example report.
4. Examined the PEEL method of paragraph structuring.

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Getting started as a group

- What do you want to accomplish in your first meeting?

Introductions
- What can you bring to the team?

Ground rules
- More on these soon.

Review assignment brief
- Check understanding.
- Break down into sub-tasks.
- Agree objectives.

Allocate team roles
- By negotiation and consent.

Allocate a team leader?
- Keep meeting notes?
- Co-ordinate communication?

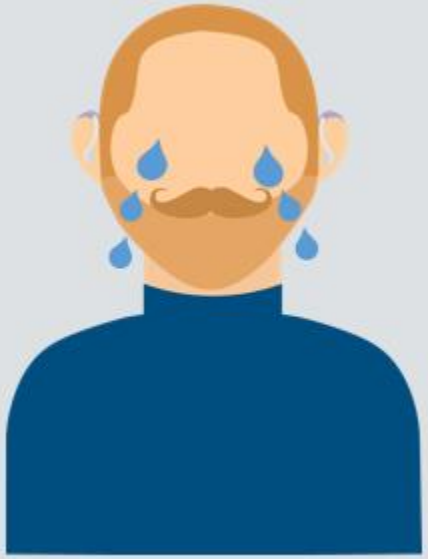
Draw up a time plan
- What sub-tasks need achieving by when?

Agree a mode of communication
- Email?
- Social media?
- Teams?

Agree next meeting
- Date
- Time
- Place

Ground rules

- What are some useful things to agree on early on?



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Some suggested ground rules

- Assign group roles and responsibilities by negotiation.
  - Will everyone contribute to the reading?
  - Who will write which sections of the report?
- Agree when / where / how you want to meet and at what points in the assignment.
- Factor in some contingency time!

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Your graduate development and employability assignment

Research a topic relating to your course and present your findings as a formal scientific report.

- Your report should be 3,000 – 5,000 words in length, excluding appendices.
- Your report should consist of the following elements:
  - Title
  - Abstract
  - Introduction
  - *At least one* numbered display equation
  - *At least one* inline equation
  - *At least one* figure or table with an appropriate numbered caption
  - *At least one* cross reference to a numbered document element (e.g., equation, figure, table, section etc.)
  - *At least three* citations to valid sources cited using Cite Them Right Harvard
  - Conclusion
  - A reference list

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How should a report be formatted?

- Adequate headings, sub-headings and numbering.
  - Some headings are pre-determined (Abstract, Introduction, Conclusion).
  - Headings for central sections are free for you to decide.
- Ensure the separate parts of your report stand out clearly.
- Use plenty of white space.
- Adequate margins.
- Use consistent and appropriate formatting

Tables, graphs, images and diagrams

Make sure that any graphics are:

- Good quality.
- Have a purpose.
- Clearly labelled.
- Do not replace text extensively. You should write some text by way of explanation of an illustration.

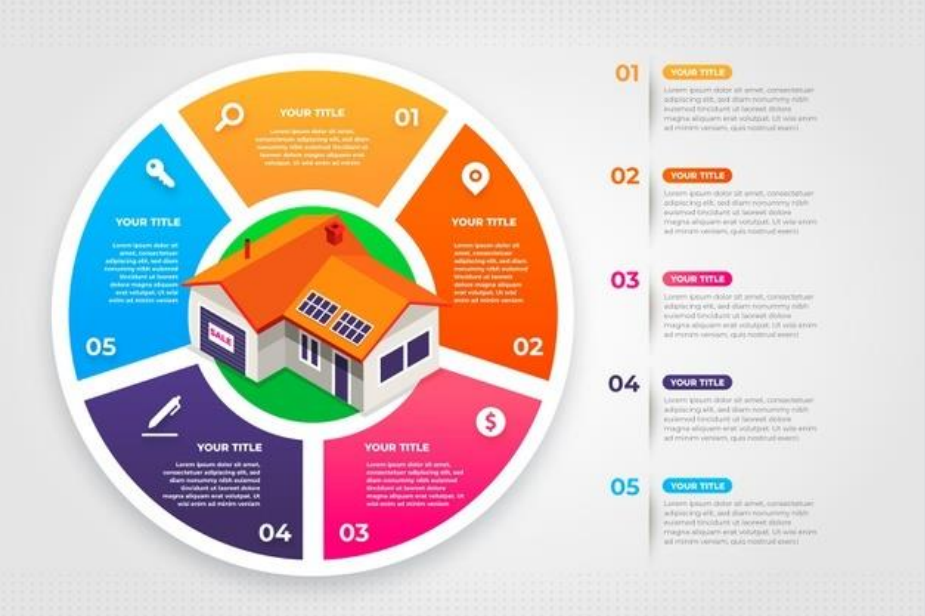

Figure 1. Pie Chart Example

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Academic Style

- **Use formal English**
  - No contractions (e.g. don't, aren't, it's).
  - No phrases that sound like speech ("do you get me").
  - No clichés ("the flaws in this argument stand out like a sore thumb").
  - No subjective descriptions ("it was a brilliant idea").
- **Use plain language**
  - Complicated language can obscure your message.
  - Shorter sentences are usually clearer than long complex ones.
- **Be brief and concise**
  - Avoid using three words when one will do!

Replace with one word:

At this point in time	Now
Due to the fact that	Because
High degree of accuracy	Accurate
In the event that	If
Prior to	Before
Subsequent to	After

Hedging

- Each extra qualifier reduces the force of the sentence. Sometimes you can say nothing at all:

‘The cause of the tiredness is unknown but possibly one cause may be staying up too late to write this assignment at the last minute, perhaps’.

- Once is enough!

Introductions

1. General statements.

- Provide your reader with the context or setting.

2. Thesis statements

- Tell the reader what you intend to do in this report.
- Tell the reader how you will do this task and what your approach will be.

3. Route map

- Help guide the reader through the text by providing a route map of the things you will cover.

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Activity: breaking down an introduction

Read through this introduction and highlight: the general statement, the thesis statement and the route map.

Long before Sudoku became famous, people were solving another family of square-grid puzzles: Magic Squares. Magic Squares have been around for over 4,000 years and have been used in different cultures for their astrological, divinatory qualities, their usage ensuring longevity and prevention against diseases (or so claimed). For example, Indian and Egyptian cultures engraved magic squares onto stone or metal, which were then worn by talismans. Within this short essay, the construction and use of of Magic Squares will be explored in more detail. First, the North East Method will be considered, before exploring a method for constructing doubly even magic squares. Finally, further reading and avenues for future research will be considered.

Answers

Read through this introduction and highlight: the general statement, the thesis statement and the route map.

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Conclusions

Start with a brief statement of your central ideas.

Briefly run through your key points (from body paragraphs).

Summarise how you have answered or addressed the question.

Remember:

- Emphasise especially anything valuable.
- Acknowledge any possible limitations your work might have.
- Make recommendations where appropriate.
- Do **not** introduce any new ideas or facts.

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Activity: breaking down a conclusion

Read through this conclusion and highlight: brief statement of central ideas, summary of key points and a final statement. Also highlight the recommendations and further reading/research suggested.

In this report we have defined what is meant by a magic square and presented methods for constructing these objects. First, the North East method allowing the filling in of any off magic squares was explained in detail. Second, the methods for even magic squares was described in depth. An area which might be explored further is whether a single magic square can be transformed into another square which preserves is magic property. This question opens door for operations, called magic square-preserving transformations, which resemble row operations in linear algebra. The first linear area magic square (L-AMS) was constructed by a maths and physics teacher Walter Trump in 2017 (Loly 2009), following initial ideas of William Walkington and Inder Taneja. Thus, the use and construction of magic squares has been considered in depth and recommendations have suggested that the concept of linear area magic squares could be explored further.

Answers

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Central sections / paragraphs

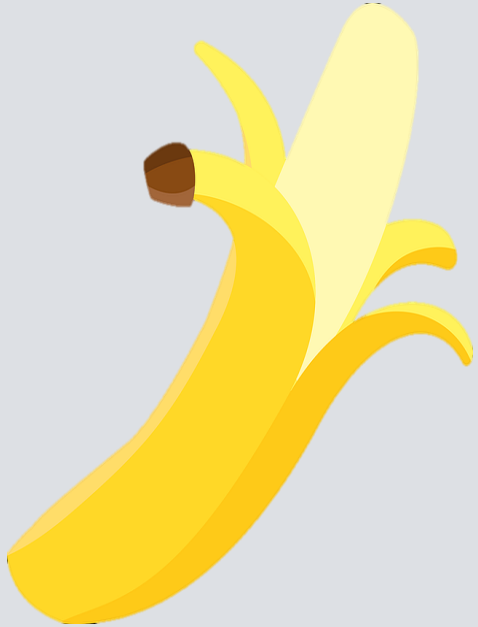
Topic sentence	**One sport where mathematics plays a big role is gymnastics.**
Claim 1	**Maths in the scoring system**
Claim 2	**Maths in the mechanics of the skills**
Claim 3	**Maths in the ranking**
Concluding sentence	**As demonstrated, mathematics plays a big role in various aspects of gymnastics as a sport.**

Structuring your paragraphs

The successful communication of your argument depends on the structure of your paragraphs.

To help you, you can use the acronym: **PEEL**

P Point	A topic sentence stating the **point** you are making.
E Evidence	Provide **evidence** and examples from your research to support your topic sentence.
E Evaluate	**Evaluate** the evidence and show your agreement/disagreement. Comment on how the evidence connects to your argument. Present possible counter arguments and evaluate these, too.
L Link	A 'so what?' summary of the evidence in this paragraph. **Link** it to your thesis statement.



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Activity: breaking down paragraph content

Identify the PEEL (point, evidence, explain, link) elements within this central paragraph.

The mathematical elements underpinning the score system of gymnastics are of central importance to the integrity of the sport as a competitive pursuit. The International Gymnastics Federation (FIG) presents a Code of Points outlining the scoring system used in international competition. Within this system, numerical scores are awarded for execution (where points are deducted from a maximum 10.0 start value) and difficulty (where points are awarded to the complexity of the move) (FIG, 2021). This numerical scoring system allows for a degree of objectivity in judging in competitive international gymnastics, which in turn allows for more fair and reliable scoring. Thus, one might argue that the mathematical element of scoring contributes significantly to the credibility of competitive gymnastics at international level.

Activity: breaking down paragraph content

Identify the PEEL (point, evidence, explain, link) elements within this body paragraph.

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Abstracts

- A short summary of your report, usually about a paragraph (approx. 6-7 sentences / 150-250 words) long.
- The first section the reader reads…but should be the last section the writer writes!
- Gives readers the gist of your paper quickly.
- Prepares readers to follow the argument in your full paper.
- Can help readers remember key points from your paper.

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Summary

- Follow the guidance given in your assignment brief closely. Ensure you include all required sections in your report.
- Format your report clearly using appropriate headings / sub-headings.
- Include relevant graphics and embed these into your text correctly.
- Use the PEEL structure to help you produce effective paragraphs.

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What questions do you have?

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General writing and study skills support

For more gernerqal support on writing and study skills from the university, please visit the study skills webpages.

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