



MDI PROJECT

REPORT

GUIDELINES

SOURCE: ESKOM SCIENCE EXPO FOR
YOUNG SCIENTISTS

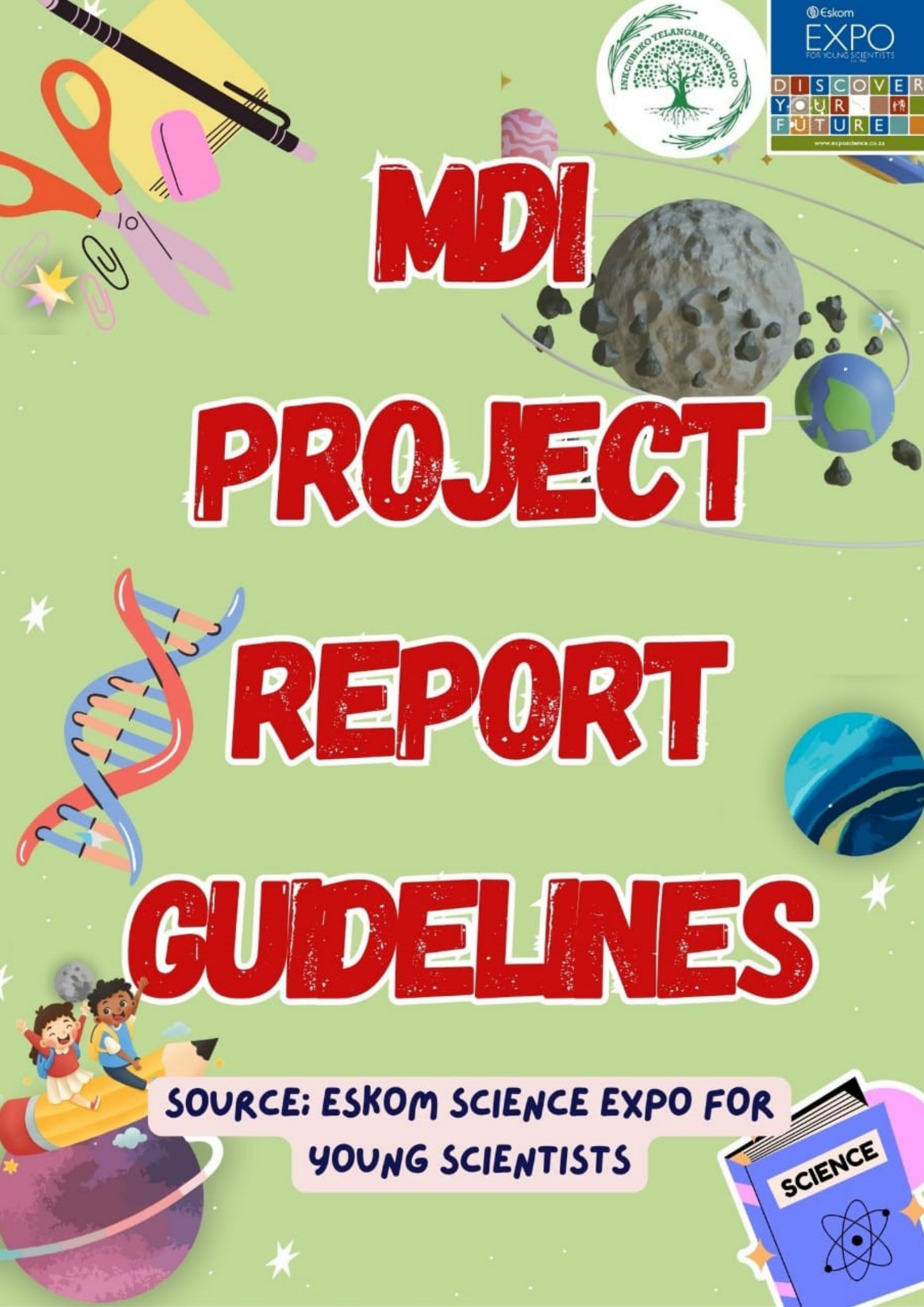


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PROJECTS REPORT & PRESENTATION GUIDELINES

Once you discover a problem or need that you wish to meet, you must submit your idea to MDI using the concept form available on the MDI website. The concept form allows you to express your ideas, needs, and obstacles to determine the type of support required. Once your concept note is approved, you can begin creating your dream project. To create your project, you must conduct research and present your findings in written format along with your completed experiments, models, or prototypes, depending on your dream project type. This guide details the report format you must follow for each project type.

Type 1: Experiments/scientific investigation

1. Introduction

In the introduction, present a brief overview to establish the need for your research. This tells the reader what the report is about, sets the research in its broader context, and explains the motivation for the project. It ranges between two to four paragraphs. Do not include your findings or decisions in the introduction.

Briefly review relevant literature, such as journal articles, books, and technical reports, to orientate the reader. Provide an overview of what is known about the research topic. Summarize previous and recent research related to your project, highlighting what is most relevant. Towards the end of the literature review, identify the significant gap you aim to fill, building up to the reason for your research project.

2. Problem Statement

Based on the gaps or knowledge found in the literature review, clearly write the problem statement or describe the issue or phenomenon being investigated. Explain the importance of researching this problem, issue, or phenomenon, which outlines the significance of your study.

3. Aim

State your aim clearly and concisely; make a clear statement of what you want to find out or achieve through your experiment/investigation. The aim describes the purpose of your project.

4. Research Question or Hypothesis

Clearly state the research question you want to answer or your hypothesis in simple terms.

5. Method

The method section describes what you did, how you did it and why you did it that way. This section must explicitly explain how you went about testing the hypothesis, solving the problem or understanding the phenomena.

Describe your methods in enough detail so anyone could replicate your research. In other words, anyone should be able to follow your methods to verify or refute what you found. Briefly explain the reasons for selecting the method. This section is written in the past tense.

6. Results

The overall purpose is to describe patterns, not to explain or interpret them. Think of the results section as telling a story about what you found when conducting your test.

7. Discussion

The discussion interprets patterns you found. Explain why you found what you found, backing it up with relevant literature. This is done by reviewing and comparing literature. Literature used must be cited and referenced using Harvard referencing (*see last page for example*). How are they similar or different to your research? Why are there differences between your research and others? Give a brief explanation of any testing issues that might have affected your final findings. What were the challenges? The discussion is an important part of your project and must be substantial.

8. Conclusion

Make sure to discuss the importance of your work and clearly state your conclusion. Write your conclusions in order to respond to one crucial question: what now? What is the meaning of the findings in general? What makes someone interested? It is necessary to acknowledge the hypothesis, the most crucial results, and state if the hypothesis is accepted or rejected.

9. References List

The reference list contains the full citations of all the in-text references you mentioned within your report and is located at the end of your project i.e under this subheading, you will ONLY include The list of your references per the format in table on the last page of

this guide.. Your reference list should include any documentation that is not your own. All sources should be arranged alphabetically according to the surname of the first author.

Type 2: Engineering/ Computer Science

1. Introduction

In the introduction, present a brief overview to establish the need for your research. This tells the reader what the report is about, sets the research in its broader context, and explains the motivation for the project. It ranges between two to four paragraphs. Do not include your findings or decisions in the introduction.

Briefly review relevant literature, such as journal articles, books, and technical reports, to orientate the reader. Provide an overview of what is known about the research topic. Summarize previous and recent research related to your project, highlighting what is most relevant. Towards the end of the literature review, identify the significant gap you aim to fill, building up to the reason for your research project.

2. Problem Statement

Based on the gaps or knowledge found in the literature review, clearly write the problem statement or describe the issue or phenomenon being investigated. Explain the importance of researching this problem, issue, or phenomenon, which outlines the significance of your study.

3. Aim

Clearly state the engineering goal/ design goal. Your goals are about solving the problem and addressing the needs identified (i.e. The main thing you want to accomplish by creating your project).

4. Research Question or Hypothesis

Clearly state the research question you want to answer or your hypothesis in simple terms.

5. Method

Engineering method

In an engineering project, you usually go through several designs. You build something, test it, find new problems, make changes, and test again (design-test-redesign-retest) until you get to the final design. To make it clear how you moved from one design to the next, you should mention the earlier designs (at least two) and explain what you learned from testing those prototypes or processes. Full details of the first prototypes should go in the Appendix. In this section, the focus is on the final design, which is the one with the best features, the fewest problems, and that still meets the needs you identified earlier.

Computer Science

When working with data, you need to specify the programming language you'll use for different tasks, as well as the key parameters or fields that will help achieve your project's goals. Flow diagrams can be useful to explain how your computational designs work. As you develop your model, describe each step in detail, ensuring that the programming language you choose is appropriate for your goals and takes into account the important parameters, arguments, or features. Testing should be done at every stage of development to make sure your model or solution is correct and robust, with each test focusing on specific characteristics. If you make any changes to the parameters, arguments, or features, be sure to explain what was changed and how it affects the overall design.

6. Results

The overall purpose is to describe patterns, not to explain or interpret them. Think of the Results section as telling a story about what you found when conducting your tests. It's important to provide context about how the data was collected, as this will help the reader better understand the results. Present your findings in a way that clearly aligns with your engineering or design goals. Start by considering what information the reader needs to determine if you achieved your aim. The data should be easy to read, which often means using graphs or tables.

7. Discussion

The discussion interprets patterns you found. Explain why you found what you found, backing it up with relevant literature. This is done by reviewing and comparing literature. Literature used must be cited and referenced using Harvard referencing (see last page for example). How are they similar or different to your project? This part explains what the patterns in your results mean and why you got those results. Talk about the good points of your design and try not to focus too much on its problems. Mention any issues or mistakes that you couldn't control, like things that might have affected your measurements. Explain how these problems changed your results.

8. Conclusion

Make sure to discuss the importance of your work and clearly state your conclusion. Write your conclusions in order to respond to one crucial question: What now? What is the meaning of the findings in general? What makes someone interested? It is necessary to acknowledge the hypothesis, the most crucial results, and state if the hypothesis is accepted or rejected.

9. References List

The reference list contains the full citations of all the in-text references you mentioned within your report and is located at the end of your project i.e. under this subheading, you will ONLY include The list of your references per the format in the table on the last page of this guide.. Your reference list should include any documentation that is not your own. All sources should be arranged alphabetically according to the surname of the first author.

Type 3: Theoretical/Mathematical

1. Introduction

In the introduction, give a short overview that explains why your project is needed. It should help the reader understand the bigger picture and why you're doing this project. This part should be two to four paragraphs long and should not include your results or conclusions. For the literature review, briefly summarize relevant books, articles, and reports to help the reader understand what is already known about your topic. Review both old and recent research related to your project and highlight the most important information. At the end of the literature review, point out the key gap in the current knowledge that your project aims to address. This will explain why your research is important.

2. Problem Statement

Based on the gaps or knowledge found in the literature review, clearly write the problem statement or describe the issue or phenomenon being investigated. Explain the importance of researching this problem, issue, or phenomenon, which outlines the significance of your study.

3. Aim

State your aim clearly and concisely; make a statement that describes what concept, theory, or problem you want to explore, understand or solve. What are you trying to accomplish with the ideas, formulas, or models you're working on?

4. Research question or Hypothesis

Clearly state the research question you want to answer or your hypothesis in simple terms.

5. Method

In the method section of a project, you need to explain how you solved a problem or understood something. This part describes the math or ideas you used and should be written as if you are talking about things that already happened. List the things that you were studying or measuring in your project. Explain the steps you followed to do your project. You should say why you chose these steps and describe each one clearly so someone else can repeat what you did. For projects based on ideas or theories, show the basic equations you used and how you solved them. If there are long calculations, put them in a separate section called an appendix. Also, mention any computer programs you used, like MATLAB or R, and the variables that affected your results.

6. Results

The overall purpose is to describe patterns, not to explain or interpret them. Think of the Results section as telling a story about what you found when conducting your tests. It's important to provide context about how the data was collected, as this will help the reader better understand the results. Present your findings in a way that clearly aligns with your engineering or design goals. Start by considering what information the reader needs to determine if you achieved your aim. The data should be easy to read, which often means using graphs or tables.

7. Discussion

The discussion interprets patterns you found. Explain why you found what you found, backing it up with relevant literature. This is done by reviewing and comparing literature. Literature used must be cited and referenced using Harvard referencing (see last page for example). How are they similar or different to your project? This part explains what the patterns in your results mean and why you got those results. Briefly discuss all the things that affect your measurement but which you cannot do anything about, given certain constraints. This includes sources of errors in your assumptions/ calculations that bias your results.

8. Conclusion

Clearly state your conclusion and importantly, be sure to address the importance of your work. Write your conclusions to address one all-important question: - So what? What is the overall importance of your results? Why should anyone care? You must refer to the hypothesis/ question and to the most important results and you must state whether your hypothesis is supported or rejected.

9. Reference List

The reference list contains the full citations of all the in-text references you mentioned within your report and is located at the end of your project i.e. under this subheading, you will ONLY include The list of your references per the format in table on the last page of this Guide .. Your reference list should include any documentation that is not your own. All sources should be arranged alphabetically according to the surname of the first author.

Type 4: Social Science

1. Introduction

In the introduction, you should give a short summary of why your project is important and what it's about. It should explain why you chose to do this project without including your results or conclusions. For the literature review, look at previous research, like articles and books, to see what is already known about your topic. Write a brief overview of these findings and explain the gap your project aims to fill. This helps show why your project is needed and what new information it will add.

In-text referencing is used when directly quoting for example, "Water is a basic necessity" (Miya, 1980) or rewording an idea from a source, for example, Research done by Miya (1980) proves that water is a basic necessity. They are mostly used, but not limited to the Introduction and the Discussion sections.

2. Problem Statement

Based on the gaps or knowledge found in the literature review, clearly write the problem statement or describe the issue or phenomenon being investigated. Explain the importance of researching this problem, issue, or phenomenon, which outlines the significance of your study.

3. Aim

State your aim clearly and concisely. You must define the primary purpose/goal of your Research Project. It outlines what you plan to investigate, understand or analyze concerning human behavior, social structures, cultural phenomena or societal issues.

4. Research Question or Hypothesis

Clearly state the research question you want to answer or your hypothesis in simple terms.

5. Method

The method section explains what you did in your project, why you did it, and how you did it. It should be clear enough so that someone else can follow your steps to check your results. This part also briefly explains why you collected the data you did. Mention how many people took part in your project and some details about them, like their age, gender, and other relevant information. Also, explain how you asked them to join your project. List all the tools or sources you used, like questionnaires or tests. If you used data that was already collected by someone else, say where you found it and how you got permission to use it. Describe the procedure by explaining what the participants did during the project. Mention any variables (factors being tested) and how they were changed or controlled. For example, explain if changes were made between different groups of participants or within the same group. The focus should be on the participants' actions, like "the participants read instructions, completed practice trials, and filled out two questionnaires." Ensure that the questions on any tests or surveys match the project's goal. Always stay objective to avoid mistakes and bias. Attach sample questions in your report and explain how you kept participants' information private, avoiding the use of their names or personal details.

6. Results

The overall purpose is to describe patterns, not to explain or interpret them. Think of the Results section as telling a story about what you found when conducting your tests. It's important to provide context about how the data was collected, as this will help the reader better understand the results. Present your findings in a way that clearly aligns with your engineering or design goals. Start by considering what information the reader needs to determine if you achieved your aim. The data should be easy to read, which often means using graphs or tables.

7. Discussion

The discussion interprets patterns you found. Explain why you found what you found, backing it up with relevant literature. This is done by reviewing and comparing literature.

Literature used must be cited and referenced using Harvard referencing(see last page for example). How are they similar or different to your project? This part explains what the patterns in your results mean and why you got those results. Briefly describe any errors that affected your measurement but which you cannot do anything about, given certain constraints. This includes sources of errors in your methods that bias your results. Make concrete suggestions about how this project could be extended.

8. Conclusion

Clearly state your conclusion and importantly, be sure to address the importance of your work. Write your conclusions to address one all-important question: - So what? What is the overall importance of your results? Why should anyone care? You must refer to the hypothesis/ question and to the most important results and you must state whether your hypothesis is supported or rejected.

9. Reference List

The reference list contains the full citations of all the in-text references you mentioned within your report and is located at the end of your project i.e. under this subheading, you will ONLY include the list of your references per the format in table on the last page of this Guide. Your reference list should include any documentation that is not your own. All sources should be arranged alphabetically according to the surname of the first author.

Referencing

How To references in-text

In-text referencing is a way to show where you got your information from when you write. It's like giving credit to the person who originally wrote or said something, you'll use in-text referencing mostly in your Introduction and Discussion as this is where you'll do literature review. This helps others see where your facts come from and allows them to find the original source if they want to learn more. For the MDI Science Expo Report, you'll **ONLY** use **Harvard Style** of referencing.

Here's an example of in-text referencing using the Harvard Style: Research shows that exercise improves mental health (Smith, 2020). Alternatively, If you mention the author in your text: Smith (2020) found that exercise improves mental health.

Table for Referencing Different Materials in Harvard Style

Material Type	In-text citation example	Reference List Format
Book	(Smith, 2020)	Smith, J. (2020). Title of the Book. 2nd ed. Publisher.
Journal Article	(Brown, 2019)	Brown, L. (2019). 'Title of the article', Journal Name, vol. 10, no. 2, pp. 15-22
Website	(Jones, 2021)	Jones, M. (2021). 'Title of the webpage', Website Name. Available at: URL (Accessed: 12 August 2024).
Newspaper Article	(Taylor, 2018)	Taylor, R. (2018). 'Title of the article', Newspaper Name, 5 March, p. 4.
Chapter in an Edited Book	(Green, 2017)	Green, A. (2017). 'Title of the chapter', in Black, C. (ed.) Title of the Book. Publisher, pp. 45-60.
Report	(World Health	World Health Organization

Material Type	In-text citation example	Reference List Format
	Organization, 2022)	(2022). Title of the Report. Publisher.
Conference Paper	(Miller, 2016)	.Miller, P. (2016). 'Title of the paper', Conference Name, Location, Date, pp. 30-35.
Thesis/Dissertation	(Wilson, 2015)	Wilson, H. (2015). Title of the Thesis. PhD thesis, University Name