



Laboratory Report Writing

Engineering

EXAMPLE

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Teacher's Notes EXAMPLE

Aim: This lesson is designed to help students understand the essential components of a lab report, with a focus on the main sections: abstract, introduction, methodology, results, discussion, and conclusion.

Time: 90-120 minutes.

Delivery: This lesson can be delivered face-to-face or online. For online delivery, each worksheet could be placed in a class document on OneDrive.

Lead in

- Students discuss the five questions with their partner(s).
- Whole class feedback: Take students' ideas but do not give away too much at this stage.

Task 1

- Students match the components of a lab report with the corresponding definitions.
- Feedback: Students compare with a partner or a small group before being nominated to give answers to the whole class.
- Display **ANSWERS**.

Tasks 2-14

- There are a good variety of tasks to keep the students engaged and the exercises are organised in the following way:
 1. Students consider what they already know through completing a task.
 2. Students read a section of a research report and complete a task.
 3. Students summarise what they have learned.
- After each task, students should be given time to compare with a partner or a small group before being nominated to give answers to the whole class.
- **ANSWERS** can be displayed after each task.

Tasks 15-17

- These last tasks are related to the language of lab reports. Students read through the complete lab report and firstly, identify the tenses, modals and relative clauses; secondly, identify and analyse the non-integral in-text citations; and thirdly, select useful fixed phrases.
- After each task, students should be given time to compare with a partner or a small group before being asked to give their answers for the whole class.
- **ANSWERS** can be displayed after each task.

* **ANSWERS** are at the end of the worksheets.

Task 18: Extension (not included in timing)

- Students conduct an experiment and write up the results in a lab report. The instructions included on the student's worksheet are: Write a 1200-word lab report on the following: *'Investigating Heat* *Aluminium'* (See Appendix One for the students' project pack).

Differentiation Options

- Students work in pairs to complete the report.
- Students write one section only and receive teacher feedback before writing the next section.
- Decrease the word limit to 800-1000 words.
- Provide a structured template with section headings and guiding prompts (Appendix Two).

Lab Report Writing

Lead in

Discuss these questions with your partner(s).

1. Have you ever written a scientific or lab-based report before? If so, what was it about?
2. What [redacted]?
3. From your perspective, what makes a lab report clear, useful, and well-structured?
4. What are the typical [redacted] report?
5. Can you suggest a topic you have studied that could be explored through an experiment or [redacted]?

Task 1

Most lab reports share common components. Match the following components with the corresponding definitions and then compare with your partner(s).

	Component		Definition
1.	Title Page	a.	This section [redacted] in your work in a format that has been decided by the school.
2.	Abstract	b.	This tells [redacted] can locate specific sections.
3.	[redacted]	c.	This describes your findings using text and visuals.
4.	Introduction	d.	This is a [redacted] findings.
5.	[redacted]	e.	This provides the background to your research, the aims [redacted] the topic.
6.	Results	f.	This summarises your report and offers suggestions or [redacted] findings.
7.	Discussion	g.	This is a short summary of the context, methods, findings [redacted] report.
8.	[redacted]	h.	This discusses how you collected your data.
9.	Reference List	i.	This [redacted] that you have not included in the main report.
10.	[redacted]	j.	This should [redacted]

1.		2.		3.		4.		5.		6.		7.		8.		9.		10.	
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Tip: Always check with your teachers which components you need to include before you start your experiment.

Important Information

The following tasks will help you to understand the main components of a lab report by thinking about your existing knowledge and analysing a student's report. Before you start the tasks, look at the following extract of the student's task brief:

Student's Task Brief

- Write a 1200-word lab report on: *'Investigating Heat Conduction in Different Materials'*
- Include the following components: abstract, introduction, methodology, results, discussion and conclusion.
- You are expected [] experiment.
- You need to include a reference list using the Harvard Referencing System.
- You do NOT need [] appendices.

Abstract

Task 2

What do you think are the key features of an abstract of a lab report? Complete the gaps in the following sentences with words from the box below.

		implications	findings	concept	
1.	It should begin with a clear statement of the study's _____.				
2.	The _____ must be briefly described.				
3.	The _____ should be summarised, _____.				
4.	Key _____ must be presented without detailed statistics.				
5.	Results should _____ being studied.				
6.	It needs to end with a brief comment on the study's _____.				

Task 3

Read and analyse the abstract of a student's lab report and complete the following exercises.

Investigating Heat Conduction in Different Materials	
<p>This experiment investigates the rate of _____, _____.¹ A uniform heat source was applied to one end of each metal rod, and the temperature change _____.² The results confirmed that copper has the highest thermal conductivity, followed by aluminium, _____.³ The findings reinforce theoretical predictions and have practical implications for material selection in _____.⁴</p>	

Identify the function of each sentence by selecting the appropriate option from the box. Compare with a partner(s) when you have finished.

	To explain the _____	To relate the findings to real-world applications	To summarise the results	_____ purpose
1.				
2.				
3.				
4.				

Now answer these questions.

1.	Is the abstract written clearly and concisely?	Yes	No
2.	Can you understand the whole report from the abstract?	Yes	No

Reflection

What have you learned about the abstract of a lab report? Put your ideas in the box and be prepared to share with the class.

Introduction

Task 4

What do you think are some of the key features of an introduction to a lab report? Decide from the following options. Compare with your partner(s) when you have finished.

	Features	Yes	No
1.	To introduce the topic and context.		
2.	To [REDACTED]		
3.	To review the relevant literature.		
4.	To [REDACTED]		
5.	To identify a gap or problem.		
6.	To state [REDACTED]		
7.	To state the hypothesis.		
8.	To provide [REDACTED] experience.		

Task 5

Read the introduction of the student's lab report and reorder the sentences so that they are logical. Add your answers to the table below and then compare with your partner(s) when you have finished.

Introduction

It is hypothesised that copper will exhibit [REDACTED] aluminium, while stainless steel and glass will show significantly lower rates.¹ This investigation [REDACTED] materials under identical conditions, providing empirical support for the theoretical hierarchy of thermal [REDACTED] the [REDACTED] alongside convection and radiation.³ Understanding thermal conductivity is essential in numerous [REDACTED] and electronic [REDACTED] creating efficient energy systems.⁴ Metals such as copper and aluminium are commonly used where high [REDACTED] as [REDACTED] heat resistance is beneficial (Davis, 2000).⁵ This is a property that varies significantly between metals, [REDACTED], 2015).⁶ It [REDACTED] between adjacent particles within a material (Incropera et al., 2007).⁷ The rate at which heat flows through [REDACTED] thermal conductivity.⁸

	Reordered Sentences
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

Reflection

What have you learned about the introduction of a lab report? Put your ideas in the box and be prepared to share with the class.

Methodology

Task 6

What are some of the key features of the methodology section of a lab report? Match column A and column B to make full sentences.

	Column A		Column B
1.	It identifies the type of study	A.	including thermocouples, a Bunsen burner, a stopwatch, and clamp stands.
2.	It explains the materials used	B.	such as and glass rods.
3.	It set- up used	C.	including temperature readings every 30 seconds for 5 minutes.
4.	It outlines the step-by-step procedure	D.	experiment using metal rods.
5.	It states how variables were	E.	including how temperature was recorded at a
6.	It explains how data was collected	F.	such as using rods of equal length and heating

1.		2.		3.		4.		5.		6.	
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Task 7

Read and analyse the methods section of a student's lab report and complete the following exercises.

Methodology

Materials

, made from different materials: copper, aluminium, stainless steel, and glass.¹ To ensure uniform heating, a Bunsen burner was used as the heat source.² , a ruler, clamp stands, a heat-proof mat, and heat-resistant gloves.³ A data logger was also available to across .⁴

Procedure

Each rod on a heat-proof mat, with one end exposed to the flame of a Bunsen burner.⁵ A thermocouple was attached 15 cm from the heated end of the rod to record angle to maintain uniform heat input.⁷ Once heating began, temperature readings were taken at 30-second .⁸ was allowed to return to room temperature before the next material was tested under the same conditions.⁹

Control Variables

To ensure fair : the rods were identical in length and diameter; the temperature was measured at the same distance from the and duration of heating were standardised.¹⁰ The room temperature was monitored and maintained .¹¹

Can you identify any of the key features from task 6 in the student's report? Complete the table with your partner.

	Feature	Yes	No	Sentence Number(s)
1	The type of (e.g., field study, comparative design).			
2	The (e.g., what was measured, what was compared).			
3	The materials and equipment are clearly listed.			
4	The set up is repeated.			
5	The measurement tools and frequency are described.			
6	Conditions were comparison.			
7	The methods used for data collection are appropriate to the aim.			
8.	Limitations of the methods are acknowledged.			

Reflection

What have you learned about the methods section of a lab report? Put your ideas in the box and be prepared to share with the class.

Results

Task 8

What are some of the key features of the results section? Rejumble the following sentences with your partner(s) to find out.

1.	bias or any/ as they are.
2.	research questions or objectives/ structure order.
3.	research highlight the key results/ to the/ succinctly.
4.	ensure they are labelled/ if using tables or / to illustrate your data.
5.	relevant redundant descriptions/ only focus on.
6.	in this section/ do not explain why/ only it means.

Task 9

Find the ten errors the student has made with verb forms in their results section. Complete the table below and then compare with a partner.

Results

The experiment was measuring the [redacted] different metal rods over a five-minute period. The results will show that copper could conduct heat the [redacted] 89°C by the [redacted] followed, reaching 78°C, while stainless steel and glass has demonstrated significantly slower heat transfer, with [redacted] respectively. These [redacted] Figure 1, which is showing the rate of temperature increase for each material over time. The [redacted] rised [redacted] materials, [redacted] rates. Copper and aluminium showed steep increases during the early stages, while the glass rod has [redacted] remained only slightly above [redacted] throughout. Exact temperature values at each [redacted] in Table 1.

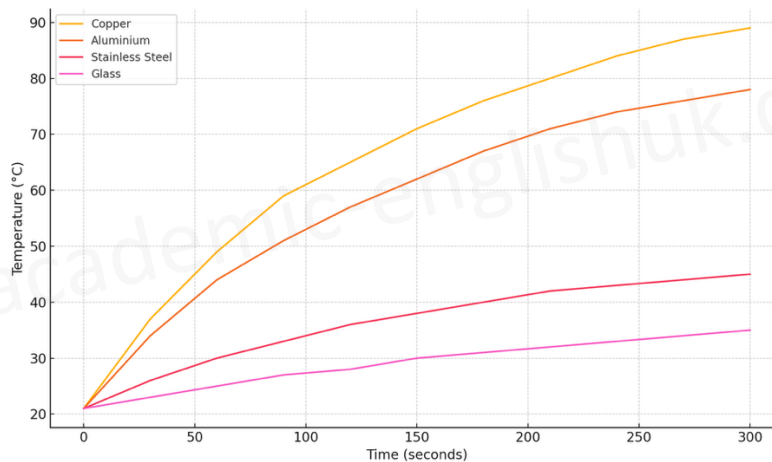


Figure 1: Temperature over time [redacted] four different materials (Graph created by ChatGPT, 2025).

Table 1: Temperature (°C) at [redacted] for each material (Table created by ChatGPT, 2025).

Time (s)	Copper (°C)	Aluminium (°C)	Stainless Steel (°C)	Glass (°C)
0	21	21	21	21
30	37	34	26	23
60	49	44	30	25
90	59	51	33	27
120	65	57	36	28
150	71	62	38	30
180	76	67	40	31
210	80	71	42	32
240	84	74	43	33
270	87	76	44	34
300	89	78	45	35

	Language Errors	Correction
1.		
2.		

3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Reflection

What have you learned about the results section of a lab report? Put your ideas in the box and be prepared to share with the class.

Discussion

Task 10

What are some of the key features of the discussion section of a lab report? Read the following paragraph and complete the gaps with words from the box below.

		findings		literature		aim
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The Discussion section begins by _____ in relation to the _____. It provides an _____ of the results, linking them to previous _____ and psychological theory. The _____ study's _____ directions for _____ research.

Task 11

Read and analyse the discussion section of the student's lab report and complete the following exercise.

Discussion

The results strongly support the hypothesis, with copper _____ reaching _____ five minutes, which aligns with its high thermal conductivity of 385 W/m·K (Callister and Rethwisch, _____, reaching _____ conductivity of around 205 W/m·K and explains its widespread use in aerospace and cookware, due to _____, _____ (Ashby and Jones, 2012).² In contrast, stainless steel and glass demonstrated much lower heat conduction, _____ conductivities of approximately 16 W/m·K and 1 W/m·K (Davis, 2000).³

Such results _____ and highlight the suitability of glass and stainless steel in contexts where insulation or heat resistance _____ distinct _____ and non-metals in this experiment illustrates the key role atomic structure plays in thermal _____. Despite _____ findings, minor variations in thermocouple calibration and heat loss to the surrounding environment _____⁶ Surface oxidation _____ aluminium, may also have influenced heat transfer efficiency (Tritt, 2017).⁷

incorporating better insulation, using multiple measurement points, or conducting repeated trials remain and reinforce the practical importance of material choice in engineering design (Incropera et al., 2007).⁹ rapid heat dissipation, such as electronics and radiators, while materials like glass and stainless steel or protective thus provides both empirical support and .¹¹

Match each sentence with its corresponding function and then compare with your partner(s) when you have finished.

Sentence Number	Sentence Function	
1	a	To present contrasting data for two other materials.
2	b	To identify a limitation related to data collection accuracy.
3	c	To interpret the applications.
4	d	To suggest improvements for future experimental design.
5	e	To conclude the to wider scientific understanding.
6	f	To link the material selection.
7	g	To summarise the key result and connects it to the hypothesis.
8	h	To reinforce that the findings are consistent with established scientific theory.
9	i	To note a reliability.
10	j	To explain the underlying scientific principle behind the observed results.
11	k	To compare a its relevance in real-world applications.

1.		2.		3.		4.		5.		6.		7.		8.		9.		10.		11.	
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Reflection

What have you learned about the discussion section of a lab report? Put your ideas in the box and be prepared to share with the class.

Conclusion

Task 12

What are the key features of the conclusion of a lab report? Decide if the following sentences are true or false and then compare with your partner(s) when you have finished.

	Key Features	True	False
1.	This should be a short section with no new information.		
2.	It discusses		
3.	It analyses the limitations in the methods used.		
4.	It summarises		
5.	It offers recommendations based on the findings.		
6.	It is written		

Task 13

Use the key information provided to write the conclusion to the same student's lab report with your partner in the box provided below.

1.	State that the aim was to investigate heat conduction in different materials.
2.	Report that [REDACTED] efficiently.
3.	Note that stainless steel and glass were less conductive, with lower final temperatures.
4.	Highlight that the results [REDACTED] values.
5.	Comment that atomic or molecular structure influences conductivity.
6.	Mention [REDACTED] for fair comparison.
7.	State that surface oxidation or air movement may have affected precision slightly.
8.	Emphasise that [REDACTED] applications.

Conclusion**Task 14**

What are the similarities and differences between your conclusion and the student's conclusion?

Similarities	Differences

Reflection

What have you learned about the conclusion of a lab report? Put your ideas in the box and be prepared to share with the class.

Task 15

Read through the student's complete lab report. Highlight examples of the tenses, modals and relative clauses that the student used in the colours and features suggested below and analyse the reason the student used this language. Compare with your partner(s) when you have finished.

Investigating Heat Conduction in Different Materials

Abstract

This experiment investigates the rate of heat conduction in four different materials: copper, aluminium, stainless steel, and glass. A uniform heat source was applied to one end of each metal rod, and the temperature change was measured at regular intervals along its length. The results confirmed that copper has the highest thermal conductivity....

WHOLE TEXT REPORT INCLUDED IN PAID VERSION....

Language	Example	Reason for Use
Present simple active		
Present simple passive		
Past simple active		
Past simple passive		
Future simple		
Modal verbs active		
Defining relative clause		
Non-defining relative clause		

Task 16

Read through the student's complete lab report again and identify the in-text citations and add them to column one of the table. Complete the other three columns with the requested information and then compare with your partner(s) when you have finished.

Non-integral citations	Information Included	Meaning of 'et al'	Reason for use
1.			
2.			
3.			
4.			

5.				
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Task 17

Read through the student's complete lab report again. What fixed phrases could you use in your research report? Complete the table with the following information.

	Fixed Phrase	Section
1.	<i>This experiment investigates + noun phrase</i>	<i>Abstract</i>
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Extension

Task 18

You are now ready to write your own lab report using primary data. Read through the following information carefully and ask your teacher when your deadline is and where you should submit your report.

Student's Task Brief

- Write a 1200-word lab report on the following: *'Investigating [redacted] vs. [redacted] Aluminium'*
- Include the following features: abstract, introduction, methods, results, discussion and conclusion.
- You are expected [redacted] experiment.
- You need to include a reference list using Harvard Referencing System.
- You do NOT [redacted] appendices.
- See Appendix One for the students' pack.

Lab Report Writing **ANSWERS**

Task 1

	Component		Definition
1.	Title Page	a.	This section displays all the sources you have used in your work in a format that has been decided by the school.
2.	Abstract	b.	This tells your readers exactly where they can locate specific sections.

1.	<i>j</i>	2.	<i>g</i>	3.		4.		5.		6.		7.		8.		9.		10.	
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Abstract

Task 2

	methods	implications	samples	results	materials	aim
1.	It should begin with a clear statement of the study's <u>aim</u> .					
2.	The type, number and properties of the tested <u>samples</u> must be briefly described.					
3.	The <u>methods</u> should be summarised, including...					

ALL ANSWERS INCLUDED IN PAID VERSION...

Appendix 1: Student's Project Pack

Heat Conduction in Recycled vs. Pure Aluminium

Project Overview

This project focuses on designing and conducting an experiment to compare the thermal conductivity of recycled aluminium and pure aluminium. Students will plan, carry out, and report on their own investigation, using scientific methodology and academic conventions.

Research Aim

To determine [] aluminium conducts [] aluminium.

Research Question

Does [] a lower rate of heat conduction [] aluminium?

Objectives

- Prepare aluminium samples ([]) for testing using standard procedures.
- Measure and record temperature changes using...

FULL APPENDIX INCLUDED IN PAID VERSION...

Appendix 2: Lab Report Template

Heat Conduction in Recycled vs. Pure Aluminium

Title: *Investigating Heat Conduction in Recycled vs. Pure Aluminium*

1. Aim

What is the purpose of your investigation?

2. Hypothesis

What do you predict will happen?

3. Materials

List all the materials and equipment you used.

FULL APPENDIX INCLUDED IN PAID VERSION...