

**SCIE4001 - Science III: Earth and Life Sciences Part II**

**PRACTICAL WORK - Activity II (10 marks)**

**STRAND 5 - ENERGY**

**Assignment II: Determining How the Number of Layers of Paper affects its Insulating Properties**

**THE CHALLENGE:**

Many people freeze water in a bottle and take the ice with them to work/school. Since many people use paper to wrap the bottle, we want to investigate the ability of paper to prevent the ice from melting. The property of paper being investigated is its *ability to conduct heat* or rather to prevent heat (*insulation*) from being conducted from the warm atmosphere to the cold bottle.

We have to be careful to be fair when we make comparisons.

We will discuss this in class.

Then in groups you will design and carry out a fair test that will help determine how the number of layers of paper affects the rate of melting of the ice.

**Instructions:**

- Work in groups of four.
- The Rubric on pages 3 should guide your report.
- Each group
  - is expected to prepare a report on the activity.
  - member must on a SEPARATE PAGE state his / her explicit contribution to the group. Other members will verify as true or false.
    - The number and time of organized meetings.
    - the exact research done.
    - with whom the research was shared.
    - section of report written singly / jointly.
    - number of meetings and times of meetings attended either online or face to face.
    - must sign other members' contribution report as agreed or disagreed.
  - Member failing to state the exact contribution or verify from other members of the group contributions as true or false may result to a loss of marks.



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- Submission of Assignment: Your assignment
  - Should have a cover page with the following information:
    - Date.
    - Course name and course code (SCIE 4001 - Science III: Earth and Life Sciences Part II).
    - Official name of the Assignment (Assignment II: Determining How the Number of Layers of Paper affects its Insulating Properties).
    - Names of all group members, Student ID Number, phone contact and email.
    - Name of Lecturer
    - Mr. Kishore Lal prefers **ONLY** a soft copy of the lesson, please use the following protocols when submitting:
      - Use Microsoft Word to prepare the document.
      - Include all your drawings in the appropriate places in the text.
      - Name of file: ***Group leader's name your campus SCIE3001 Activity II.***
      - Group leader submits report to Mr. Kishore Lal by email to [sanshore@gmail.com](mailto:sanshore@gmail.com) and copy to other members of the group. Failure to observe these protocols may result in loss of marks.
    - Other lecturers may issue different protocols for submission of the assignment.

Your write up should **include** the following:

1. Title
2. Statement of the problem/Aim
3. Hypothesis
4. Apparatus/Materials
5. Variables
6. Method
7. Results/Data
8. Interpretation of data
9. Conclusion
10. Discussions

Rubric

	Criterion	Criterion Mark	Section Mark	Your Mark
Title	Stated	1	1	
Statement of the problem/Aim	Stated	1	2	
	Defines the task	1		
Hypothesis	Testable	1	2	
	Links two variables	1		
Apparatus/Materials	Incomplete list	1	3	
	Complete list	2		
	Diagram	1		
Variables	Manipulated	1	3	
	Responding	1		
	3 Variables held constant	1		
Method	All steps are present	3	6	
	Most steps are present	2		
	Few steps are present	1		
	Sequential order	1		
	Clear language	1		
	Correct grammar and spelling	1		
Results/Data	All pertinent data recorded	2	3	
	Some data recorded	1		
	Data organized in a table	1		
Interpretation of data	Addresses hypothesis	1	2	
	Addresses variables	1		
Conclusion	Logical	1	3	
	Based on data collected	1		
	Statement on next step	1		
Discussions	Critical appraisal of the activity	1	4	
	Full appraisal of the activity	1		
	Sources of Error	1		
	Relates sources of error to variables	1		
Overall	Cover page has all information on group and activity.	1	1	
Subtotal			30	
10% of Final Mark = $\frac{\text{Subtotal}}{3}$			10	