TCE Techniques Of Communication and Expression

University of Jijel
1st year Biology

1. Types of communication
2. Scientific terminology
3.Text analysis and comprehension
4. Study of proposed texts (observe, analyze, take stock, expression written)
5.Techniques of written expression: Scientific report writing

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Chapter IV. Techniques of written expression

Written expression

Written expression is the ability to **communicate ideas clearly in written form**. It is essential in academic, scientific, and professional contexts.

Report writing

A **report** is a formal written document that presents information in a **structured, objective, and organized way**, often based on research, experiments, or observations.

Types of reports

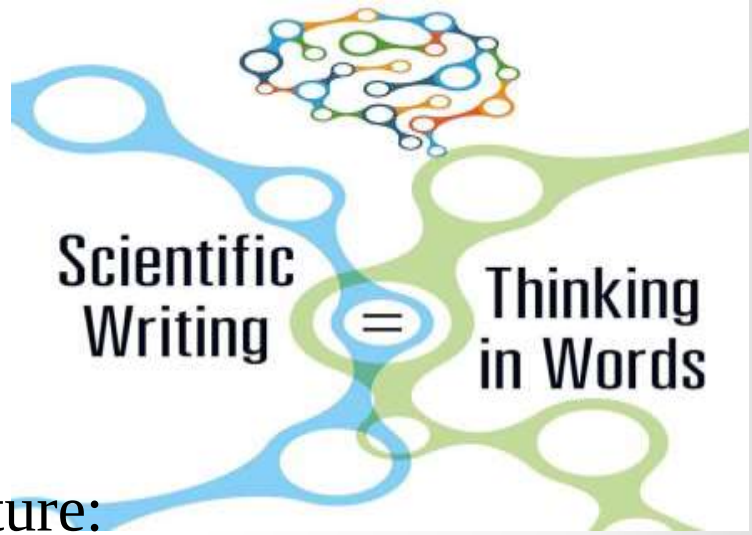
- **Scientific report** (experiments, lab work)
- **Technical report** (engineering, technology)
- **Administrative report** (business, management)
- **Field report** (observations in real situations)

Writing scientific reports

Scientific report writing is an essential skill in biology, chemistry, and environmental sciences. It teaches students how to present experimental results clearly, logically, and scientifically.

A scientific report aims to:

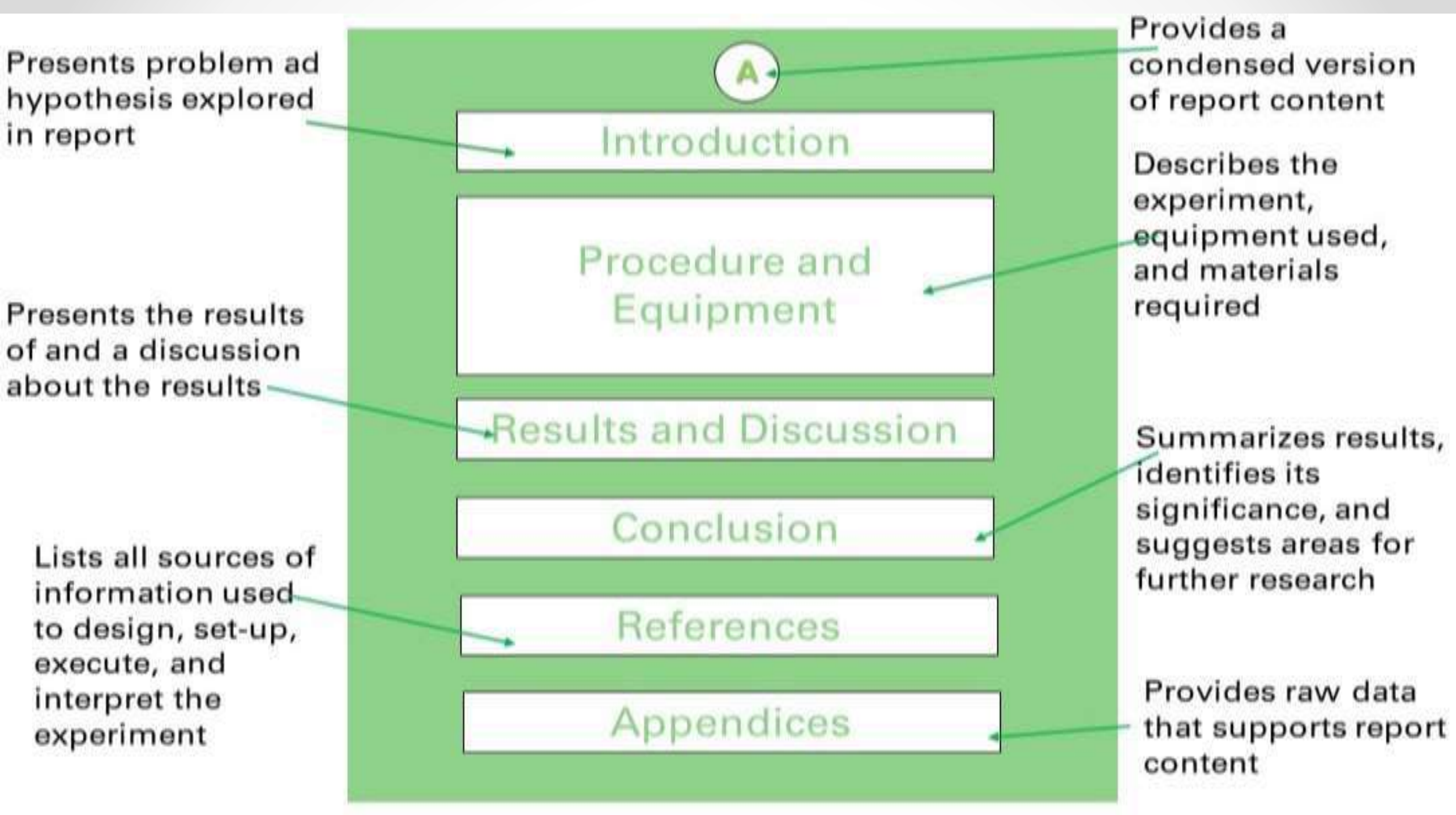
- ✓ Communicate the results of an experiment.
- ✓ Allow others to repeat the experiment (reproducibility).
- ✓ Develop scientific reasoning and critical analysis.
- ✓ Organize data and observations in a structured way.



The structure of a scientific report

The report is generally organized according to the following structure:

- ✓ Title page
- ✓ Introduction
- ✓ Bibliographical overview (general background)
- ✓ Materials and methods
- ✓ Results and discussion
- ✓ Conclusion
- ✓ References (bibliographic list)


Presents problem ad hypothesis explored in report
A
Provides a condensed version of report content
Introduction
Describes the experiment, equipment used, and materials required
Procedure and Equipment
Presents the results of and a discussion about the results
Results and Discussion
Summarizes results, identifies its significance, and suggests areas for further research
Conclusion
Lists all sources of information used to design, set-up, execute, and interpret the experiment
References
Provides raw data that supports report content
Appendices

Title page

The cover page is a formal component of any research document. It works like an “identifier card” for your project, because it shows all the main information about the work you did. Below is the list of everything that should appear on the cover page:

Country name

Ministry of Education

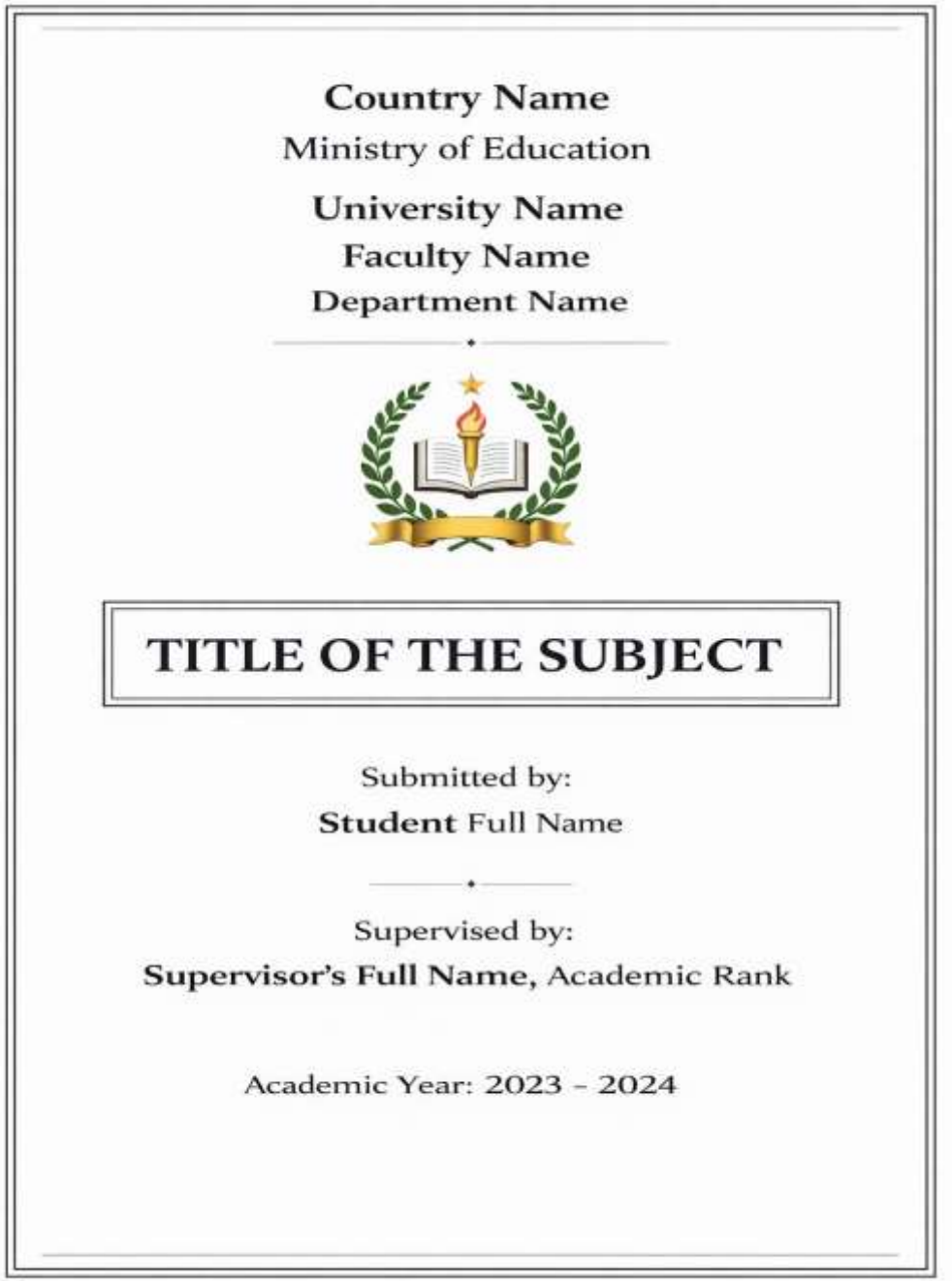
University information: name of the university, faculty, and department

Title of the subject: written in the center of the page, in bold, inside a box, and in a bigger font

Student’s full name

Supervisor’s full name and academic rank

Academic year



For internship reports, dissertations, or theses, the cover page also includes:

Order and serial numbers: given after the defense for organization and archiving

A sentence describing the type of work: (internship report, or thesis), the degree (Licence, Master, Doctorate), and the study field

Example: Master's thesis in Biological Sciences

Jury information: full name, academic rank, and university of each jury member

Defense date

COUNTRY NAME
Ministry of Higher Education and Scientific Research

UNIVERSITY NAME
Faculty of .....
Department of .....

TITLE OF THE SUBJECT
(Bold, Uppercase, Large)

Master's Thesis in Biological Sciences

Presented by:
Student Full Name

Supervised by:
Prof./Dr. Full Name (Academic Rank)

Jury Members:
- Prof. Full Name – Rank – University (President)
- Dr. Full Name – Rank – University (Examiner)
- Dr. Full Name – Rank – University (Supervisor)

Defense Date: .....
Academic Year: 2025 – 2026

Order Number: .....
Serial Number: .....

Abstract

- The abstract usually comes right after the cover page or sometimes at the end of the report. Its purpose is to give the reader a clear and quick understanding of the main points of the work, helping them decide whether to read the full report.

- A good abstract briefly explains: the aim of the study, the problem being addressed, the method used, the main results, and the conclusions. It is often accompanied by **keywords** (up to ten) to highlight the topic.

- For dissertations or theses, the abstract may be provided in several languages (e.g., Arabic, French, English in Algeria) to reach a wider audience (no citations in the abstract).

Task: Write a 150 word abstract for an experiment on the effect of salt concentration on seed germination.

Answer:

This study investigated the effect of salt concentration on seed germination. Seeds were exposed to different salinity levels (0%, 0.1%, 0.5%, 1.0%, and 2.0%). The results showed that low salt concentrations (0.1% and 0.5%) did not significantly affect germination compared to the control. However, higher concentrations (1.0% and 2.0%) caused a marked decrease in germination rates. These findings suggest that high salinity inhibits germination by inducing osmotic stress and disrupting water uptake. This study highlights the importance of salinity management for optimal plant growth.

Introduction

The introduction should explain the main topic of the report and catch the reader's attention. It gives basic background information and the scientific context. The introduction should include:

General context

Example: The effect of salt concentration on the germination process.

Problem / Research question

Does salt concentration affect the germination rate of seeds?

Hypothesis

If salt concentration increases, then seed germination decreases.

Objective of the experiment

This study aims to investigate the effect of different salt concentrations on the germination rate of seeds.

Task: Write an introduction for an experiment testing the effect of salt concentration of seed germination.

Answer:

Seed germination is a vital stage in the life cycle of plants, determining their successful establishment and growth. This process is influenced by environmental factors such as water availability, temperature, and soil composition. Among these factors, soil salinity plays a significant role, as high salt concentrations can create osmotic stress that reduces water absorption by seeds, thereby inhibiting germination. Understanding how salt affects seed germination is important for agriculture, especially in areas with saline soils. The objective of this study is to investigate the effect of different salt concentrations on the germination rate of seeds.

Materials and methods

In this section, the author should provide all the information needed to understand how the experiment or research was carried out. It must clearly explain what was done, where, and with what materials (e.g., study location, organisms tested, equipment, treatments, etc.). The goal is to give enough detail so that another researcher or student can repeat the same work. The description of the experimental procedure should include:

- ✓ The accuracy and type of instruments used
- ✓ The conditions in which the experiment or research took place
- ✓ The species or samples studied
- ✓ The experimental plan (duration, treatments, number of measurements, repetitions, etc.)
- ✓ The tools used to collect and analyze the data
- ✓ A photo of the experimental setup.

Writing style

- Use passive voice.

For example, “Plants were measured every 24 hours.”

- Use past tense

Task: Design and describe an experiment to evaluate the effect of different salt concentrations on seed germination.

Answer:

Materials:

- ✓ Seeds (same type and size)
- ✓ Sodium chloride (NaCl)
- ✓ Distilled water
- ✓ Petri dishes
- ✓ Filter paper or cotton
- ✓ Measuring cylinder
- ✓ Balance
- ✓ Marker

Method:

All steps of the experiment were carried out as follows: salt solutions of different concentrations (0% as control, 0.1%, 0.5%, 1.0%, and 2.0%) were prepared using distilled water, a layer of filter paper or cotton was placed in each Petri dish, an equal number of seeds (e.g., 10 seeds) was added to each dish, each dish was moistened with the corresponding salt solution, the dishes were incubated under the same environmental conditions of temperature, light, and humidity, the respective solutions were added regularly to maintain moisture in the medium, and the number of germinated seeds was observed and recorded daily for a fixed period (e.g., 5–7 days).

Germination rate (%) = (Number of germinated seeds / Total number of seeds) × 100

Results and discussion

The results and discussion section is the core of the report. It usually requires the most time, effort, and critical thinking before reaching the final conclusion. This part is generally divided into two components analysis and interpretation which demand scientific honesty to ensure that the findings are accurate and trustworthy.

- **Results:**

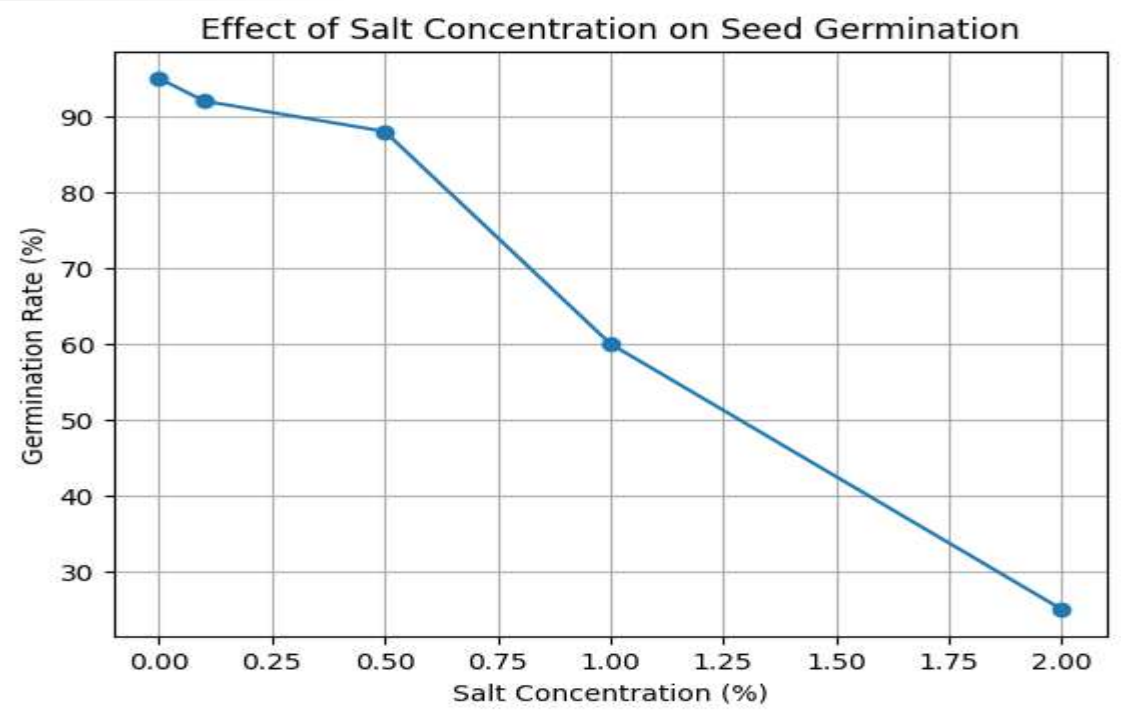
Presentation of data using tables, graphs, and text
No interpretation or discussion here

Task: Present hypothetical results illustrating the effect of different salt concentrations on seed germination, using either a table or a graph.

Table: The effect of salt concentration o seed germination

Salt concentration (%)	Germination rate (%)	Observation
0 (Control)	95%	Normal germination
0.1	92%	Similar to control
0.5	88%	Slight/no effect
1.0	60%	Noticeable decrease
2.0	25%	Strong inhibition of germination

Graph: The effect of salt concentration o seed germination



Text:

Germination remains high at low salinity (≥88%) but drops sharply at higher concentrations, reaching very low levels at 2.0% salt

- **Discussion:**
  - ✓ Interpretation of results
  - ✓ Comparison with literature or expected outcomes
  - ✓ Explanation of any anomalies or errors

Task: Write a discussion for an experiment on the effect of salt concentration on seed germination

Answer:

"The results demonstrate that salt concentration significantly affects seed germination rates. At low salt concentrations (0.1% and 0.5%), germination rates were comparable to the control group (0% salt), indicating that these levels are tolerable for the seeds However, at higher concentrations (1.0% and 2.0%), germination rates decreased sharply, suggesting that excessive salt inhibits water uptake and disrupts metabolic processes These findings align with previous studies showing that high salinity induces osmotic stress in plants. Future research could explore the mechanisms of salt tolerance in different plant species to improve crop resilience in saline soils.

Conclusion

The conclusion is the final part of the report. It restates the main findings and summarizes what the author has learned from the study. It should also evaluate whether the initial objectives were achieved. If the work is not complete, the author may suggest ideas or directions for future research.

Common phrases to start a conclusion: ‘we showed that…’, ‘we found that…’, ‘we can conclude that**…**

Note: The introduction and conclusion are key sections of any report. They should give the reader a clear understanding of what the main text contains. For this reason, it is important to write them carefully and thoughtfully

Task: Write a conclusion for an experiment on the effect of salt concentration on seed germination.

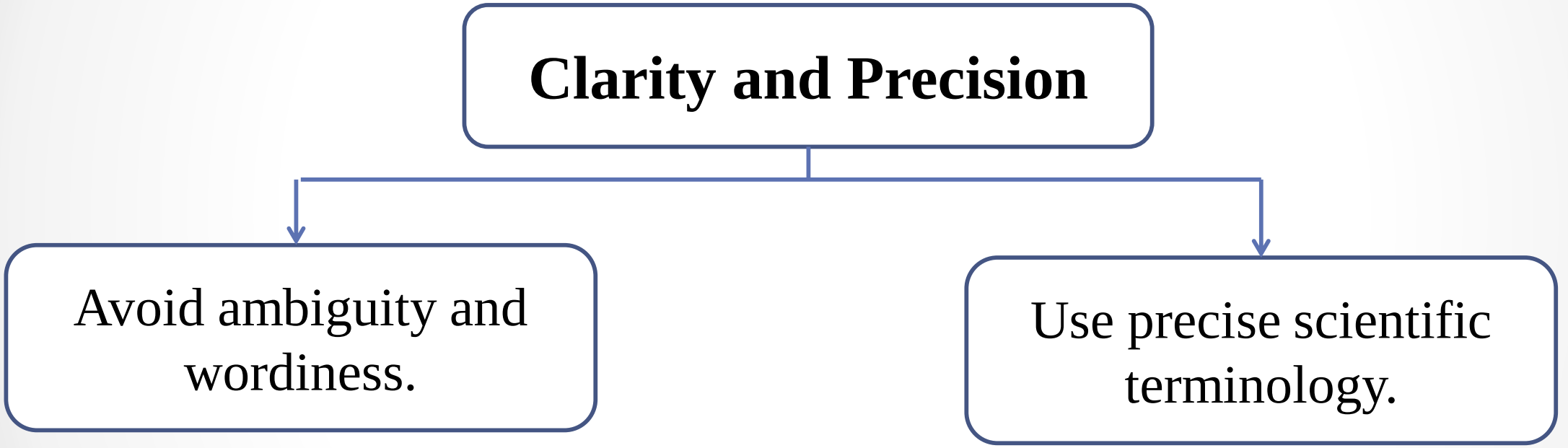
Answer:

We can conclude that salt concentration strongly influences seed germination. Low levels have little effect, while high salinity significantly reduces germination due to osmotic stress. These findings highlight the importance of controlling soil salinity and encouraging research on salt-tolerant plants.

References

Any scientific idea or information taken from a source must be cited (Article, book, thesis...).

Grammar and syntax for scientific writing



Common grammar rules

Subject –verb agreement

Singular Subjects with Singular Verbs

Example 01: "The **result** of the experiment **shows** a significant increase in enzyme activity."

Explanation: The singular subject **"result“** requires the singular verb**"shows"**.

Example 02 : "The **data set is** available for further analysis."

Explanation: The singular subject **"data set“** requires the singular verb **"is"**.

Plural Subjects with Plural Verbs

Example 01 : "The **results** of the experiment **show** a significant increase in enzyme activity."

Explanation: The plural subject **"results“** requires the plural verb**"show"**.

Example 02 : "The **data sets are** available for further analysis."

Explanation: The plural subject **"data sets“** requires the plural verb **"are"**.

Tenses

Use **past tense** for methods and results
Example : "The experiment was conducted").

Use **present tense** for general truths or conclusions
Example : "Enzymes catalyze reactions").

Exercise : Correct the tense in the following sentence
"The results show that the enzyme works best at 37°C .(Change to past tense for a lab report)

Answer: The results showed that the enzyme worked best at 37°C.

Articles (a, an, the)

Use "the" for specific nouns (e.g., "the“)

Use "a/an" for general nouns (e.g.,"a" sample)

Exercise: Fill in the blanks with the correct article:
“..... sample was collected from the solution and analyzed under ..... microscope. ..... unusual structure was observed in the cells. ..... structure indicated a possible adaptation to environmental stress.”

Answer: A sample was collected from the solution and analyzed under a microscope. An unusual structure was observed in the cells. The structure indicated a possible adaptation to environmental stress.

Passive voice

Commonly used in methods and results sections (e.g., "The solution was heated").

Exercise: Rewrite the following sentence in passive voice
"The researcher measured the absorbance using a spectrophotometer

Answer: "The absorbance was measured using a spectrophotometer

Activity 1

Task: Rewrite the following sentences in passive voice:

- The scientist measured the temperature every hour.
- The students analyzed the data using statistical software.
- The researcher collected the samples from the field.
- The technician prepared the solutions in the laboratory.
- The students observed the cells under the microscope.
- The scientist recorded the results carefully.
- The team conducted the experiment under controlled conditions.

Activity 2

Fill in the blanks with the correct article (a, an, the):

- "..... experiment was designed to test ..... effect of ..... temperature on ..... enzyme activity.
- "..... scientist used .....spectrophotometer to measure ..... absorbance."

The end