

TERMITE TRIALS

Most termites found in the Southeast are referred to as subterranean termites, meaning that the major portion of the colony is located underground providing them the moisture that they require. In order to maintain the social structure of these colonies, these termites use a sophisticated chemical (pheromone) communication system. "Trail" pheromone is produced by termites when they are trying to get other members of the colony to follow them to a particular area, perhaps a new food source for the colony. When termites travel, a gland produces pheromones that allow the animal to retrace its steps or to have other termites follow. Trail pheromones, like most other types, are typically short-lived so that when the food source is no longer available the trail rapidly dissipates. This keeps workers from going to the location after the food source is no longer present. Although termites utilize a wide range of pheromones categorized as trail, alarm, aggregation, recruitment, mating, and others, this exercise only examines trail pheromones.

The drying agent in the ink in Bic® pens acts similar to the trail pheromone of the eastern subterranean termite, *Reticulitermes flavipes*. When an ink line is drawn on paper the termite can pick up the scent in hopes of finding food.

The purpose of this lab is to allow you to create your own scientific inquiry using termites and our new understanding of ink pens mimicking trail pheromones. Select one variable to test, write your hypothesis and complete detailed procedure for the experiment, prepare a data table to collect results and be ready to collect data when the termites arrive!

Standard	Scientific Process Steps	3 - Proficient	4 - Advanced
1.1 reading	<i>Activate prior knowledge</i>	Summarize information from introduction in 3-5 complete sentences	Incorporate and define <i>pheromones</i> in your summary, use additional sources of information with citation of sources
1.1	<i>Generate questions</i>	Question is stated but minor details are missing. The question can be tested.	Question is clearly stated and explains the reason for the experiment. The question can be tested.
1.1	<i>Create Hypothesis</i>	I think... because... statement	If... then... because statement
1.1 1.5	<i>Conduct Experiment</i>	Write complete repeatable procedure, identifying and controlling for variables	Write complete, detailed, repeatable procedure, identifying and controlling for variables, including extensions
1.2	<i>Collect Data</i>	Record and visually display data accurately (chart or table)-qualitative	Mathematical calculations (percentage accuracy, etc.)-quantitative
1.2	<i>Analyze Data</i>	3-5 complete sentences looking for patterns within your data	3-5 sentences looking for patterns and relationships between variables and controls
1.3 1.5	<i>Make Conclusions</i>	4-8 complete sentences describing whether or not data supports hypothesis	4-8 complete sentences describing whether or not data supports hypothesis and identify strengths and weaknesses in lab design and discuss accuracy in data collection
Writing Work Ethic	<i>Share</i>	Final written lab write-up according to science investigation lab report format	Final TYPED lab write-up according to science investigation lab report format

Science Investigation Laboratory Report

Your lab report should include all of the following. You should use this outline to guide you every time you write a lab report. All sections should be clearly labeled.

Problem or question:

- State the problem in a well written, complete sentence(s).
- This may be in the form of a question.
- You may include a discussion of purpose/prior knowledge as an introduction **before** stating the question.

Hypothesis:

- This is what you THINK the answer will be to the question you asked in the Problem section.
- Example: "I think _____ will occur because _____."
- The hypothesis is often called a "prediction" or an "educated guess".

Materials:

- This is a list of equipment, materials, etc. needed to perform the investigation.
- This list should be neat and organized.

Procedure:

- This is a numbered, step-by-step set of instructions of EXACTLY what you did or will do to test your hypothesis.
- Only one direction per step.
- Someone should be able to duplicate or copy your experiment by reading your procedure.
- Have a safety step at the beginning to address any safety issues that may come up.

Data & Observations:

- Include all measurable data you collected; organize into a table or chart.
- All data must be displayed neatly (such as in a chart and/or graph).
- Facts only here!!

Discussion & Analysis:

- Tell the reader what you think your data means. Look for patterns, trends, similarities and discuss.
- Why do you think the result turned out the way it did?
- Discuss any data that doesn't seem to belong. Errors?
- Answer any "teacher assigned questions" here.

Conclusion:

- Discuss whether or not your results supported your hypothesis.
- What did you learn from this investigation?

Some other items:

- All final reports must be written in blue or black ink, or typed.
- No errors, scribble-outs, typos, or spelling errors. This is a PERFECT document. White out is ok. Use rulers to draw graphs and tables.

TERMITE TRIALS

1. Activate Prior Knowledge: Write a 3-5 sentence summary of the "Termite Trials" information given to you.

2. Question: Write a testable question about the ink trail that termites may follow.

3. Hypothesis: Write your Hypothesis as an "I think _____ because _____" statement.

4. Experiment:

Materials:

- a. This is a list of equipment, materials, etc. needed to perform the investigation.
- b. This list should be numbered, neat, and organized.

Procedure:

- c. This is a numbered, step-by-step set of instructions of EXACTLY what you did or will do to test your hypothesis.
- d. Only one direction per step.
- e. State your variable, controls, and how you will use your materials.

Variables:

- f. Identify the experimental/manipulated variable.
- g. Identify the responding/dependent variable.
- h. Identify controlled variables for the experiment

5. Collect Data: Include all measurements or observations in a table or chart.

6. Analyze Data:

- a. Describe any patterns, trends, or similarities in your collected data.
- b. Describe why you think the result turned out the way it did.
- c. Discuss any data that doesn't seem to belong. What errors did you make?

7. Conclusion:

- a. Discuss whether or not your data supports your hypothesis.
- b. What did you learn from this investigation?
- c. Conclusion is written in a supported CEAL format (review CEAL wheel).

8. Share

- a. All final reports must be neatly written or typed.
- b. No errors, scribble-outs, typos, or spelling errors. This is a PERFECT document.