

# WRITING AN EXPERIMENTAL REPORT

## FROM INTRODUCTION TO CONCLUSION

Now it's time to write a report about your experiment. But, first let's answer **THE** important question: Why do scientists bother to write a report about their experiments? Is it necessary for you to write a report about your experiment? You did the experiment. You tested your hypothesis. You've learned what you wanted to learn. Why not get on with something else?

The answer is simple and straightforward. Experimental results must be shared. Each shared experiment adds to our knowledge about the universe. Unreported experiments do not add to this knowledge because only the investigator knows about them. No one else can learn from unreported results. Unreported experiments are so useless that scientists say, "The unreported experiment is an undone experiment."

### MAJOR COMPONENTS

Of the six parts of an experimental report, you have already learned how to do four of them. The six major components of a simple report are:

<i>Name</i>	<i>Class</i>	
	Title	Learned in Chapter 3
	Introduction	<b>WILL LEARN IN THIS CHAPTER</b>
	Experimental Design Diagram	Learned in Chapter 3
	<i>Materials</i> Procedure	Learned in Chapter 7
	<i>Observations</i> Results (Data Tables, Graphs)	Learned in Chapters 9, 10, 11
	Conclusion	<b>WILL LEARN IN THIS CHAPTER</b>
	<i>References</i>	

### AN INTRODUCTION

The introduction section of the report tells the reader what the research problem was all about. It states your **reason**, or why you decided to study the topic you investigated. It also states your **purpose**, or what you hoped to learn by doing the experiment. Finally, the introduction states your **hypothesis**. The introduction to an experimental report provides answers to three questions:

1. Why did you conduct the experiment? (**Reason**)
2. What did you hope to learn? (**Purpose**)
3. What did you think would happen? (**Hypothesis**)

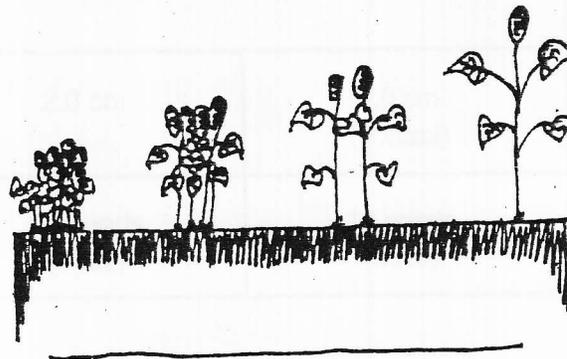
## A CONCLUSION

A conclusion is a summary of an experiment. Someone who reads only the conclusion section of your report should be able to understand what your experiment was about. The summary should give your results, describe what those findings mean, and suggest new questions that should be investigated. A good conclusion can be written by answering six questions.

1. What was the purpose of the experiment?
2. What were the major findings?
3. Was your hypothesis supported by the data?
4. How did your findings compare with other research or with information in the textbook?
5. What possible explanations can you give for the findings?
6. What recommendations do you have for further study and for improving the experiment?

## SAMPLE REPORT

Study the science report on "The Effect of Over-Crowding of Bush Bean Seeds on Plant Height," that follows. The report contains all the major components of a simple science report. The three questions for writing an introduction and the six questions for writing a conclusion are indicated in the margin. This will allow you to see how the report answers the questions for the introduction and the conclusion.



The report is written in the third person using complete sentences. Each sentence includes enough of the question so that you don't need the question to understand the answer. It is important that the answers begin by phrasing the questions as statements. For example, Question 3 of the introduction, "What did you think would happen?" might be written like this: The researcher hypothesized that if the distance between seeds is decreased, then the height of the plants will decrease.

## TITLE

### The Effect of Over-Crowding of Bush Bean Seeds on Plant Height

#### Introduction

- Question 1: Reason The directions written on many seed packets state how far apart the seeds in the packet should be planted, such as 4 cm. They warn about crowding. The directions, however, do not describe how the growth of plants that are overcrowded will be harmed. Knowledge of how close together seeds can be planted without harm is important when growing space is limited.
- Question 2: Purpose The purpose of this experiment was to determine the effect of decreasing the distance between bush bean seeds on the height of the plants.
- Question 3: Hypothesis The researcher hypothesized that if the distance between the seeds was decreased below the recommended distance on the seed packet (4 cm), then the height of the plants that grew from the seeds would also decrease.

Figure 12.1 Experimental Design Diagram

<i>Problem</i> Title: The Effect of Overcrowding of Bush Bean Seeds on Plant Height			
Hypothesis: If the distance between the seeds is decreased below the recommended distance of 4 cm, then the height of the plants will decrease.			
IV: Distance Between Seeds (cm)			
0.5 cm	1.0 cm	2.0 cm	4.0 cm (control)
10 seeds (trials)	10 seeds (trials)	10 seeds (trials)	10 seeds (trials)
DV: Height of plants (cm)			
C: Container—flower box, 50 cm x 15 cm x 15 cm			
Soil—Bob's Potting, 10 cm deep			
Light—Fluorescent shop light at 30 cm above plants with 2 40-watt light bulbs, 12 hr. light per day from 7 am to 7 pm			
Fertilizer—none			
Water—250 ml sprinkled on plants every third day			
Seeds—bush bean			

#### Materials

#### PROCEDURE

Four flower boxes measuring 50 cm x 15 cm x 15 cm were filled to a depth of 10 cm with Bob's Potting Soil. Ten bush bean seeds were planted 0.5 cm apart in the first box. In the second box the 10 seeds were planted 1 cm apart. In the third box the

10 seeds were planted 2 cm apart. In the last box the 10 seeds were planted 4 cm apart. Every third day 250 ml of water were sprinkled evenly on the soil in each box. The boxes were placed 30 cm below a fluorescent shop light. Each light contained two 40 watt regular fluorescent bulbs. The lights were turned on for a 12 hr. period each day from 7 a.m. to 7 p.m. The room was kept at 24°C. The height of the plants was measured in centimeters at the end of 30 days.

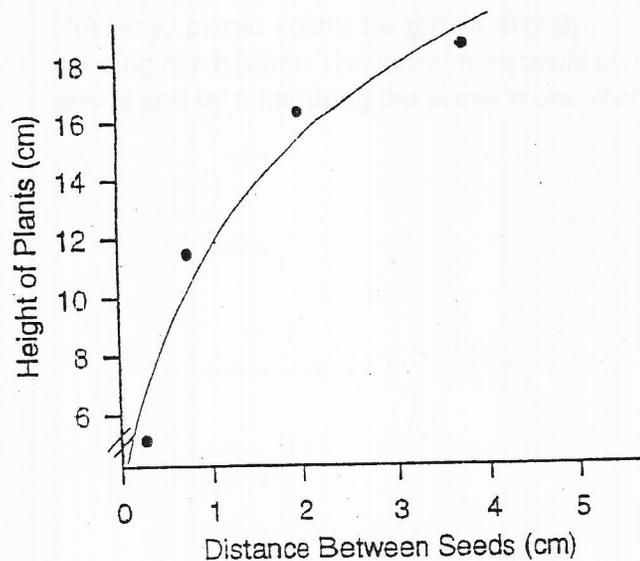
*Observations*

## RESULTS

Table 12.1 Effect of Over-Crowding on the Height of Bush Bean Plants

Distance Between Seeds (cm)	Height of Plants (cm)										Average Height (cm)
	Trials										
	1	2	3	4	5	6	7	8	9	10	
0.5	6	8	5	7	7	6	8	5	4	6	6
1	15	14	13	12	15	12	11	13	12	14	13
2	17	18	16	15	15	17	16	16	15	15	16
4	18	17	17	18	16	15	19	16	18	17	17

Figure 12.2 The Effect of Distance Between Bush Bean Seeds on Plant Height



Summary Sentence: As the distance between the seeds decreased the height of the plants also decreased. The range in height was similar.

## CONCLUSION

- Question 1: Purpose            The purpose of this experiment was to determine the effect of decreasing the distance between planted bush bean seeds on the height that plants would grow.
- Question 2: Major Findings    It was found that seeds planted close together were shorter. When seeds were planted very close, the increased distance made more of a difference. For example, when the distance was doubled from 0.5 to 1 cm the plant height increased by about 7 cm. However, when the distance was doubled from 2 to 4 cm the plant height only changed by about 1 cm. The ranges in plant heights were similar.
- Question 3: Support for Hypothesis    The data supported the hypothesis that decreasing the distance between seeds would decrease the size of the plants.
- Question 4: Comparisons With Other Research    These findings agree with the statements on seed packages and in plant books that warn to avoid overcrowding.
- Question 5: Explanation            When the plants were planted closer together, they competed for the same light, air, water, and soil nutrients. Therefore, there were fewer materials for the plant to use in photosynthesis, the process by which it makes food. Without the food the plant could not grow.
- Question 6: Improvements and Recommendations    This study should be repeated using other kinds of seeds. The effect of spacing distances between 2 and 4 cm should also be investigated. Possibly, plants could be grown slightly closer than 4 cm without causing much harm. The experiment could be improved by using more seeds and by measuring the plants more often.

*References*