

Scientific Method Lab

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08/21/18

Objective: To perform the scientific method to solve a problem. To determine if everyday tasks take longer or happen faster without the use of thumbs.

Introduction: This lab enabled students to utilize the scientific method to determine if everyday tasks take longer or happen faster without the use of thumbs. A scientific method is an organized plan for gathering, organizing, and communicating information. It allows a person to solve a problem, answer a question, and understand an event. The scientific method begins with an observation or information obtained through your five senses (touch, smell, sight, taste, and hearing). The next step is forming a hypothesis or a proposed answer to a question. The hypothesis of this lab was everyday tasks with take longer without thumbs because thumbs allow people to grip objects better. After a hypothesis is formed, it is tested by creating an experiment. In the lab, the experiment was to complete four tasks once with thumbs and then once without thumbs. An experiment contains three variables. The independent variable causes a change. The dependent variable changes in response to the manipulated variable. Lastly, the control are variable you keep the same so only one variable is changed at a time. After the experiment, conclusions are made by analyzing the data.

Materials: stopwatch, book, pencil, paper, goggles, and shoes.

Pre-Lab Questions:

- 1) **What is the goal of the scientific method?** The goal of the scientific method is to solve a problem or better understand an observed event.
- 2) **Define scientific method.** An organized plan for gathering, organizing, and communicating information.

Procedure: Four activities were chosen and completed by one person. First, the full name (first, middle, and last) of the participant was written on a piece of paper with the use of thumbs. Second, a shoe was untied, taken off, put back on, and retied with the use of thumbs. Next, a textbook was turned to page 56 with the use of thumbs. Finally, goggles were put on and taken off of the participant's head. Each activity was timed using a stopwatch on a phone. Once all the activities were completed with the use of thumbs, the thumbs on both hands were taped down. Each activity was completed again without using thumbs. Each activity was timed using a stopwatch on a phone.

Data/Results:

Activity	Time (sec) to complete activity with thumbs	Time (sec) to complete activity without thumbs
Writing full name (first, middle, and last)	8.51 sec	10.35 sec

Untie your shoe, take it off, put it back on, and tie it.	2.84 sec	8.14 sec
Turn to page 56 in a textbook	3.28 sec	4.84 sec
Put on and take off goggles	2.27 sec	5.48 sec

Post-Lab Questions:

- 1) What was the experimental question of this experiment?**
 - a. The experimental question was "will everyday tasks take longer or happen faster without the use of your thumbs?".
- 2) What was your hypothesis?**
 - a. I think everyday tasks will take longer without the use of your thumbs because we use our thumbs to grip objects.
- 3) What is the independent variable in this experiment?**
 - a. The use of thumbs or no thumbs
- 4) What is the dependent variable in this experiment?**
 - a. Time in seconds
- 5) What are the controls/constants of the experiment?**
 - a. Same tasks were used between trials, same person completed each trial, same timing device was used, same person timing each time.
- 6) Describe what your results show.**
 - a. The results showed that when thumbs were not used, the tasks took longer.
- 7) Did your results support your hypothesis? Explain why or why not.**
 - a. Yes, the hypothesis was that the tasks would take longer without thumbs. On the data sheet all tasks took longer without thumbs.
- 8) Give two ways in which you could improve upon this experiment in the future.**
 - a. More options for tasks and make the tasks more difficult.

Conclusion: The objectives of this lab were met. Using the scientific method, the experimental question "will everyday tasks take longer or happen faster without the use of your thumbs" was tested. The results showed that all of the tasks took longer without thumbs. These results supported the original hypothesis that everyday tasks will take longer without the use of your thumbs. Possible sources of error that could have affected the results include dropping the goggles while trying to put them on without thumbs. If the goggles were not dropped, the activity's time might have been faster. Another source of error could have occurred if there was a delay in stopping the stopwatch if the timer did not hear the person say stop. If the lab was repeated, an improvement would be to tape down the thumbs better. The list of possible activities could also provide more options or more difficult tasks. Lastly, one could improve upon the experiment by re-performing the experiment to determine if the results would be the same.