

Writing a Lab Report

How do you share the results of an experiment?

A lab report is like a story about an experiment. The details in the story help others learn from what you did. A good lab report makes it possible for someone else to repeat your experiment. If their results and conclusions are similar to yours, you have support for your ideas. Through this process we come to understand more about how the world works.

1 The parts of a lab report

A lab report follows the steps of the scientific method. Use the checklist below to create your own lab reports:

- Title:** The title makes it easy for readers to quickly identify the topic of your experiment.
- Research question:** The research question tells the reader exactly what you want to find out through your experiment.
- Introduction:** This paragraph describes what you already know about the topic, and shows how this information relates to your experiment.
- Hypothesis:** The hypothesis states the prediction you plan to test in your experiment.
- Materials:** List all the materials you need to do the experiment.
- Procedure:** Describe the steps involved in your experiment. Make sure that you provide enough detail so readers can repeat what you did. You may want to provide sketches of the lab setup. Be sure to name the experimental variable and tell which variables you controlled.
- Data/Observations:** This is where you record what happened, using descriptive words, data tables, and graphs.
- Analysis:** In this section, describe your data in words. Here's a good way to start: *My data shows that...*
- Conclusion:** This paragraph states whether your hypothesis was correct or incorrect. It may suggest a new research question or a new hypothesis.

2 A sample lab report

Use the sample lab report on the next two pages as a guide for writing your own lab reports. Remember that you are telling a story about something you did so that others can repeat your experiment.

Name: Miranda O.

Date: October 20, 2006

Title: Temperature change of air vs. water

Research question: Which heats up faster, air or water?

Introduction:

I have noticed that when I go swimming in an outdoor pool, the water feels cool on sunny days, even when the surrounding air is very warm. I know that the water and air are both heated by the same source, the sun.

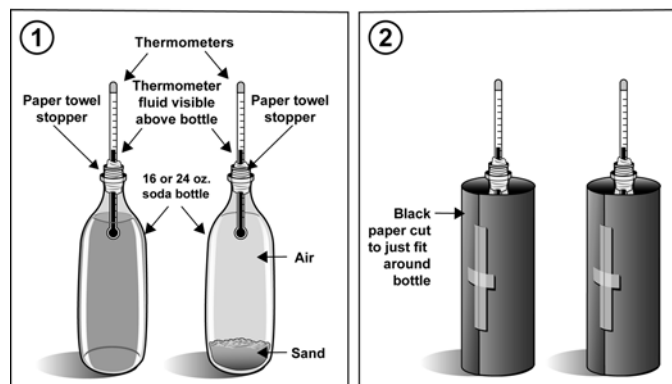
Hypothesis: My hypothesis is that air heats up faster than water when the same amount of heat is applied.

Materials:

- | | |
|---------------------------------------|-----------------------------------|
| 2 24-ounce clear plastic soda bottles | paper towels |
| tap water | stopwatch |
| 1/2 cup sand | 2 sheets black construction paper |
| 2 standard Celsius thermometers | clear adhesive tape |

Procedure:

1. I filled one 24-ounce clear plastic soda bottle with tap water to within 2.5 centimeters of the top.
2. I poured a handful of sand into another bottle of the same size and shape. This was just to steady the bottle by adding a little weight. This bottle was filled with air.
3. I wrapped strip of paper towel around a thermometer and stuck it in the neck of the first bottle. The thermometer's bulb was underwater. The top of the thermometer fluid could be seen above the paper towel (see diagram).



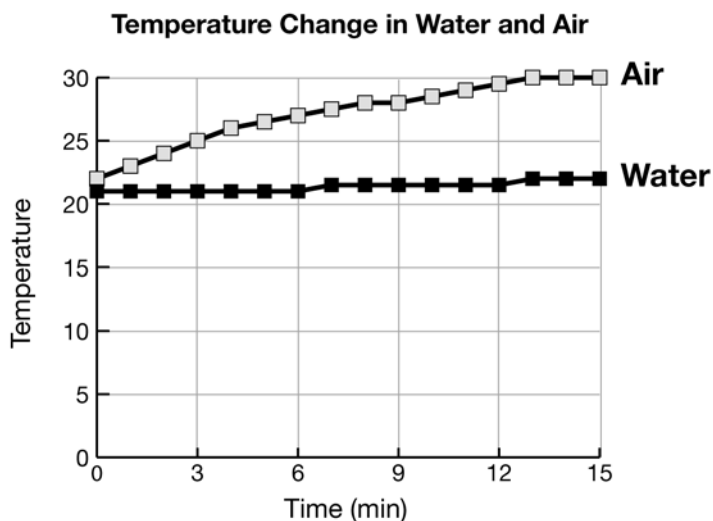
4. I put a thermometer in the second bottle using the same process.
5. I surrounded each bottle with black construction paper and taped it in place. The bottles were covered but the paper did not overlap. The black paper absorbed the sun's heat so that the bottles warmed up faster.

6. I put both bottles indoors on a table in front of a south-facing window when the afternoon sun was streaming in. I turned both bottles so the tape faced away from the window. Keeping the bottles inside prevented the wind from blowing them over.
7. I recorded the temperature every 60 seconds until it stopped rising in both bottles.

Data/Observations:

Table 1: Temperature change in water and air

Elapsed time (min)	Water temp (°C)	Air temp (°C)
0 (start)	21	22
1	21	23
2	21	24
3	21	25
4	21	26
5	21	26.5
6	21	27
7	21.5	27.5
8	21.5	28
9	21.5	28
10	21.5	28.5
11	21.5	29
12	21.5	29.5
13	22	30
14	22	30
15	22	30



Analysis: My data shows that the water temperature changed only one degree Celsius during the experiment. The air temperature rose eight degrees.

Conclusion: My hypothesis was correct—air does heat up faster than water. That’s why on a warm sunny day, the swimming pool water stays nice and cool even though the surrounding air is hot. I would like to do another experiment to find out if air also cools down faster than water. I could put my bottles in a refrigerator to test this research question.