

Writing Scientific Papers:

The Materials and Methods and Results Sections

Objectives

- To become familiar with the structure of the *Materials and Methods* and *Results* of a scientific paper
- To learn the proper method for citation of Tables and Figures in a scientific paper
- To learn about the content included in a figure or table caption
- To investigate and understand how scientists convey the procedure used in experimentation

A scientific paper is composed of several parts. These include the **title**, **abstract**, **materials and methods**, **results**, **conclusion** (or discussion), and **literature cited** (or references). In this class we will write two scientific papers; however, we will start by working on the separate parts. We will begin with the *Materials and Methods* and *Results*. For this assignment you will first need to download the following paper from the Reading Room on my website:

Huntley, A.C., Costa, D.P. and Rubin, R.D. 1984. The contribution of nasal countercurrent heat exchange to water balance in the Northern Elephant Seal, *Mirounga angustirostris*. **Journal of Experimental Biology** 113, 447-454

After you have a copy of the paper, please answer each of the following questions:

1. Let's start with some terms. Define each of these terms in the context of the paper
 - a. nasal turbinate
 - b. serial cross section
 - c. sling psychrometer
 - d. hygrometer
 - e. thermocouple
 - f. respiratory water loss
 - g. relative humidity
 - h. absolute humidity
 - i. distal
 - j. proximal
 - k. nasal mucosa
2. In this paper, the *Materials and Methods* section is broken up into five sections. What is the title and what work was described in each of these sections?

3. What species was examined? How many subjects were used in this study? Where were the study subjects used in laboratory collected? Where was the laboratory work done?
4. Carefully read the *Materials and Methods* and list all of the equipment used to carry out this study.
5. How was the percentage water recovered calculated? Explain the equation. Which variables were measured? Which variables were calculated?
6. What was the accuracy of the thermocouples used in this study?
7. How many figures are present in the *Results* section? How tables are present in the *Results* section?
8. In Figure Two, describe the change in temperature with depth into the nasal passage of these seals.
9. Based on Figure Three, at an ambient temperature of 9° C what is the exhaled air temperature?
10. I really don't like the caption for Table One. A table caption should mention all of the parameters by name. Rewrite the Table One caption.
11. How many paragraphs are there in the *Results* section? Every Table or Figure in a paper must be cited in the text. In this Results section find the citation of each Table and Figure (from question 7 above) and indicate its placement by paragraph number and sentence number.