Reading a Scientific Report

Scientific reports are difficult to read and can be scary. Even scientists find the reports difficult to pore through. However, this is how science has been communicated and you CAN learn to get the information you need, with some practice.

Science knowledge generally builds incrementally, though sometimes folks make a revolutionary discovery. So, you will NOT find in a primary research report all the information you need; you will have to read several.

Most reports have an abstract or summary, introduction, methods, results and discussion. Sometimes these parts are well-delineated, as in the Journal of Bacteriology, but sometimes they are not, as in Science magazine. In some journals, the methods are described in the figure legend.

Look first at the abstract. It may not be immediately obvious if the information described is what you need. Be patient. After a while, you will begin to recognize words and authors.

What ways are the data presented? Graphs, charts, tables, photographs? Even without reading carefully, look at the pictorial representations. What patterns are apparent to you? Can you distinguish the dependent and independent variables? Are controls or standards evident?

Next look at the methods. How was the experiment performed? What supporting studies were done in addition to the main experiment? What controls and standards were used? What scientific limitations were described? What scientific limitations were apparent to you?

Now read the article from the beginning and look back and forth at the data and methods and then at the data and interpretations of the results. Do you agree that the methods can provide the data; that the data support the results the author(s) claim?

Experience, persistence and patience all contribute to the confidence you will gain as you read primary scientific papers. Once enough colleagues and competitors can verify and extend the findings reported, the results become part of our general scientific understanding and eventually end up as content in textbooks.

Remain skeptical and consider how YOU might conduct the experiment to test the hypothesis the authors propose. There are many ways to examine life's processes and you can make a contribution.