

Goal Analysis
Micromodule One - Scientific Reading and Data Analysis
(Using Type II Diabetes as the Content)

Aim: The aim of this module is to teach learners how to read and interpret different data sets in published scientific research as well as how to read and extract salient meaning from peer reviewed scientific papers when the learner may have limited understanding of much of the vocabulary and concepts. The aim is to raise their level of comfort, confidence and fluency in approaching scientific research.

Goals:

- Read bar graphs completely taking into account title, key, axes and their meanings.
- Interpret the meaning of the data on bar graphs.
- Read data table(s) taking into account title, key, axes and meaning of the data.
- Interpret the meaning of the data on a data table.
- Read scatter plot graphs (or variations) and interpret the meanings.
- Read and interpret pie charts as well.
- Understand the parts of a scientific journal article, how they are structured.
- Learn how to read and interpret a typical scientific journal article even when the subject matter is beyond full understanding.
- Understand what information you can extract from different parts of a scientific journal article.
- Answer questions based upon understanding of the general information put forth in some example journal articles.
- Find a journal article that applies to their life or a loved one's life and read it using the approach suggested earlier in the unit (AAAS).

Final Goals and Ranking:

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- Interpret the meaning of the data on bar graphs.
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- Find a journal article that applies to their life or a loved one's life and read it using the approach suggested earlier in the unit (AAAS).

Data Analysis Module Description

This unit is designed to be part of any life science (or even physical science) course and is meant to expose students to scientific publications that are found in peer reviewed journals. The idea is that they become comfortable looking at actual research in its published form, even if they don't fully understand everything that is written in the article. The skills they should emerge with should include being able to interpret different kinds of datasets presented in different types of graphs and tables. Also, they will learn a process by which they can approach a scientific journal article and extract as much meaning as is possible given their current education level on the topic. Finally, they will be able to articulate and demonstrate what the different parts of a science journal article entail and what each part can tell the reader. Ultimately, the goal of this unit is to give students fluency in how to read, interpret and possibly use published scientific research and data. Learning Objectives are stated below:

Terminal Objective: Students will read and assess multiple data sets from published research, in the form of graphs or data tables, on one general topic and be able to describe to peers at least four trends they see in the data.

- Students will be able to identify which data is supported by a bar graph showing rates of diabetes in the U.S. amongst five different ethnic groups and genders.
- Students will look at a graph that displays dietary intake data showing cause and effect relationships between certain types of food and diabetes risk factors and be able to compare and contrast at least two different trends.
- Students will look at a graph and some reading of an explanation of the graph regarding genes associated with Type 2 Diabetes risk and be able to state evidence supporting the notion that Type 2 Diabetes has a genetic component as well.

Terminal Objective: Students will be able to read and identify the key points of a research study in a peer reviewed published journal article.

- Students will be able to identify the key concepts that are introduced in a video and article on the epidemic of Type 2 Diabetes.
- Students will be able to list and explain at least four practices that can help them read a scientific paper without giving up.
- Students will practice reading and extracting reading from two real peer reviewed journal articles on diabetes by reading the articles and being asked to identify the key points in each section of the papers.
- Students will create a guide for others to use regarding how to process a scientific journal article.
- Students will find their own research article that interests them and interpret it.
- Students will reflect on how they feel at this point in the program.