

This *General Botany & Ecology Study Guide* aims to assist you in developing an effective "study plan." Here is how to acquire and adapt it to your proficiency and learning style:

1. Obtain your *Study Guide* along with other resources at the BIO 2130 home page, <http://www.cedarville.edu/dept/sm/silvius/2130/2130main.htm>. You should add this site to your internet "Favorites."
2. The *Study Guide* explains each study assignment, **emphasizes concepts** you will need to study and learn for each upcoming class discussion, and **provides overviews** to help you see each assignment in relationship to previous topics.
3. Read each assignment with sufficient attention to **write answers** to **STUDY QUESTIONS** and/or understand the **STUDY OUTLINE** when it is included.
4. **Successful completion of each assignment** will enable you to come to class discussion having gained enough familiarity with the Study Outline to use it as an aid to note taking, and as a resource to aid your participation in class and group discussions.
5. **In printed form**, the **STUDY QUESTIONS** and **STUDY OUTLINE** can be **integrated logically into your other notes and handouts to form a "Botany/Ecology Journal"** (see [Syllabus](#), page 4). Organize the pages in logical sequence for easy access and note-taking during class and for later study out-of-class.

Before you access your first assignment through the Course Schedule at the BIO 2130 home page, if you are determined to excel in the mastery of terminology, concepts, and principles, consider how you could incorporate into your personal learning style the **READING AND STUDY PLAN** on the next page.

The "Rationale and Objectives" in your Syllabus, page 1, are aimed at fostering *biological literacy*. This quality is defined as follows:

<p><b>BIOLOGICAL LITERACY:</b></p> <p><b>BOTANICAL and ECOLOGICAL LITERACY:</b></p>	<p>The quality of being able to understand biological concepts, make moral and ethical judgements about biological issues, and solve real-world problems that involve biological issues.</p> <p>Components of biological literacy related to the sub-disciplines of <i>botany</i> and <i>ecology</i>.</p>
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How does one develop greater "botanical and ecological literacy?" By analogy, think of your textbooks, syllabus, this *Guide*, and other study materials as the BLUEPRINT. Like a blueprint, these materials can assist you in bringing about the reality of greater biological literacy -- i.e., constructing the BUILDING representing the conceptual framework you will develop. The framework is composed of boards and nails, representing the vocabulary, facts, concepts, and data which you encounter. Just as a building is more than a collection of boards and nails, so biological literacy represents more than facts and definitions, important as they are. Rather biological literacy is an orderly assembly of concepts into a framework and the ability to continually modify, build onto, and apply this framework to address new topics/problems.

According to contemporary science education theory, each person who "builds" his/her botanical literacy is advancing information through several "literacy levels" as illustrated below. Note the increasing richness of understanding of the concept of PHOTOSYNTHESIS one can attain by advancing to *structural literacy* and *multidisciplinary literacy* levels:

Table 1. Biological Literacy Begins with Nominal Literacy and Works ‘Upward.’

LITERACY LEVEL	DESCRIPTION	DEMONSTRATED BEHAVIOR
MULTIDIMENSIONAL LITERACY ↑ STRUCTURAL LITERACY ↑ FUNCTIONAL LITERACY ↑ NOMINAL LITERACY	Applies knowledge to solve real-world problems  Constructs appropriate meaning of concept based upon his/his own understanding/experiences  <i>Defines</i> or <i>describes</i> a term from memory  <i>Recognizes</i> a term as "biological"	In light of a growing human population, how can PHOTOSYNTHESIS be enhanced to increase food supply?  PHOTOSYNTHESIS is the principal process responsible for sustaining life on Earth.  PHOTOSYNTHESIS = a process that converts light energy into chemical bond energy in plants  Associates "PHOTOSYNTHESIS" with <u>botany</u> or <u>ecology</u>

As you begin your study of ecology and botany, aim for concept-learning. This “literacy ladder” can be a useful model. Your objective should be to recognize that, in instances where your literacy is at this *nominal literacy* level (i.e. “recognition” and no higher), you must strive to move to higher levels. This Guide is also a proven time-saver **if** you will use it to prepare for lecture-discussions and for post-lecture study and review. If you are at *nominal* or *functional literacy* levels, you must focus on moving from *recognition* and *definition* of terms to *construction* of "appropriate meaning" within your conceptual framework. To make it work, follow two suggestions on the next page:

**Organize a "Botany and Ecology Journal"** as described in your Syllabus, page 4.

**Approach Each Assignment Logically** as directed. Each study assignment is intended to help you establish your "jump-on point" from where you are familiar and help you "move yourself along" to higher literacy levels as illustrated with "PHOTOSYNTHESIS." This is a sequence of SURVEY -> INQUIRY -> READING -> DEFINITION -> EXAMPLES -> CONCEPTUALIZE -> APPLY, and is modified from the SQ3R Method (Robinson, F.P. 1961. *Effective Study*, Harper). We call it the "S-I-R D-E-C-A Method". Each study assignment has roughly the following format, and "SIR DECA" is integrated with each part:

1. **Identify Your Assignment:** Your Syllabus, page 6, lists for each date the Study Assignment number (SA #) which you are to complete before coming to class on that day. Find that SA by number (e.g. SA #1) in your *General Botany and Ecology Study Guide*, and you will find a helpful introduction, the assigned READING, and instruction which will help you SURVEY the assignment:

SURVEY your assignment before "diving in." Read the introduction in the given Study Assignment which provides a recap and/or orientation. Your Molles Ecology text provides end-of-chapter "Summary Concepts" which are excellent; whereas, your Stern Botany text opens each chapter with an "Overview" and "Learning Goals." Here, you should determine your general level of biological literacy.

2. **Stir Up Your Mind:** Molles' Ecology presents **Concepts** to *highlight specific learning tasks*. You should now move into a questioning mode:

INQUIRY -- Carefully read each **Concept**. What questions come to mind that must be answered to understand each concept? Also, take time to read the **STUDY or DISCUSSION QUESTIONS** in your *Study Guide*. This approach will create "mental magnets" in your mind.

READING -- Instead of "passive plodding", you are now ready to read with the purpose of answering the questions you formulated. Pray for an alert, "magnetic", inquiring mind.

DEFINITION -- Botany and Ecology have an extensive vocabulary which must be mastered. Having read the assignment, you may want to list key words and define them in meaningful terms. Some vocabulary will receive more emphasis than others--note the degree of emphasis in the *General Botany and Ecology Study Guide* under **STUDY or DISCUSSION QUESTIONS**. Occasionally a **STUDY OUTLINE** will be included.

EXAMPLES -- From the context, list examples to assist in relating each vocabulary word and concept to your personal experience. Definitions + Examples promote *functional literacy*.

3. **Build Your Conceptual Framework** to gain *structural literacy* and make practical application to the real world (*multidisciplinary literacy*) as follows:

CONCEPTUALIZE -- Having good definition and examples (*functional literacy*) will assist you in associating a vocabulary word with some regular pattern of objects or events. Then, **STUDY or DISCUSSION QUESTIONS** test your readiness to see relationships between or among concepts as they relate to a particular phenomenon, model, or theory. If provided, use the **STUDY OUTLINE** which emphasizes the conceptual framework.

APPLY your new understanding as you answer **QUESTIONS**. Some of the study assignments are intended to stimulate you to apply the concepts in problem-solving situations either individually or in a **COOPERATIVE LEARNING GROUP** situation. The combination of individual study and group discussion should help you relate new concepts to your interests and previous knowledge gained from this course or in other science courses.

4. **Attend Lecture** with satisfaction that you have tried to prepare for further discussion of the content.