**PREREQUISITE KNOWLEDGE**

**Prerequisite Knowledge for**: Introduction to Biology (Biology 100)

1. **Students should understand the scientific method**

Students should be able to describe and distinguish between the different steps in the scientific method. First you must make an observation, then you must form a hypothesis about what was observed, you must then test that observation and make sure that the experiment used to test the hypothesis is reproducible. Finally you make a conclusion by either accepting your hypothesis or rejecting your hypothesis and re-testing.

1. **Know what characteristics are needed to be considered living**
   1. **Cells are the smallest units of life**
   2. **Contains DNA**
   3. **Metabolic Activity**
   4. **Sense and respond to environment**
   5. **Maintain homeostasis**
   6. **Reproduce**
   7. **Change or Evolve**
2. **Students should know how to conduct a scientific research paper**

Students will be expected to know what resources to be able to use when forming and constructing a research paper. They must understand that they must cite every reliable resource and how to reference it within the text. These websites show all the different forms of citations from magazines to websites

<http://www.apastyle.org/elecsource.html#77>. <http://library.osu.edu/sites/guides/apagd.html>

1. **They should be able to follow energy through the different levels of hierarchy**

Students should understand the basic path of energy through systems. From Primary producers → Primary consumers → Secondary consumers → Tertiary consumers etc. etc. The students should know that all energy starts with sunlight and some form of plant, whether terrestrial or marine.

1. **Students should know how to work together in group settings**

All scientist work in collaborations with other scientist to answer the different questions put forth to increase the knowledge we have. Students should know how to communicate with each other to problem solve different issues. They should also be able to work together and understand that each person is part of a greater good and that only when they all do their part can a project/problem be finished and solved.

1. **Students should understand the importance of respect**

In Biology, many scientist have different views about many issues and sometimes have different views about the same issues. Students must understand that their fellow classmates also have different views on certain issues and they should all respect each others views no matter how different they are. This allows for people to understand each other better and also allows them to work well with each other.

**7.** Students should be able to define the main terms below, these will be the basis for many of the concepts and ideas covered in this course.  
 --The students should also be able to connect all these terms and how they are related and the importance of the interactions between all these terms

-- During the course students will be quiz about some of these terms and tested both on these terms and the outlying concepts that surround these terms

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| **Biology**  **Cells**  **Tissues**  **Organs**  **Organism**  **Population**  **Community**  **Taxonomy**  **Biosphere**  **Ecosystem**  **Pollution** |

**8. List of Prerequisite Concepts, Issues, Problems.**

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| Characteristics of life:  **Cells are the smallest units of life: understand that cells come in different shapes and sizes but that all living things have cells and are made of cells**  **Contains DNA: All living organisms have different forms of DNA but they all contain the building blocks**  **of life**  **Metabolic Activity: organisms must get energy and use energy to survive**  **Sense and respond to environment: must interact with their environments in a variety of way**  **Maintain homeostasis: No matter what functions are performed by the organism, they must maintain**  **their homeostatic level**  **Reproduce: to survive organisms must reproduce and form viable offspring**  **Change or Evolve: through time organisms must adapt to their environment and as such must change**  **or evolve**  Scientific method   1. Observation: An observation must be made that cause the rise of a scientific question 2. Hypothesis: Once a scientific question has risen, it must be formulated into a hypothesis 3. Experiment: The hypothesis must be something that can be tested (experiment), AND must be reproducible; in other words once someone tests the hypothesis others should be able to perform the exact same experiment and get the exact answer. 4. Conclusion: The results of the tests will either cause the hypothesis to be accepted or rejected. If it is accepted, the hypothesis becomes a theory. If it is rejected then a new hypothesis is formed and re-tested.   Energy hierarchy:  Students are expected to know that all energy comes/start with the sun. The first organism to capture this and help to transfer this energy are both terrestrial and marine plants (primary producers), then moves up the level to animals (primary consumers…..secondary consumers….tertiary consumers etc.) This allows students to understand how basic ecology works and how systems work together. |

**9. Academic Writing**

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| When students write a scientific research paper, they should first begin with a summary that details the entire paper in a few sentences/synopsis. The students should strive to answer important questions about the topic they are writing about. Ex. IF a student is doing a paper on estuaries; What is an estuary? Why are estuaries important? Who/what is an estuary important to? How do humans impact or interact with estuaries? Etc. The questions answered by the students should pertain to the important concepts we will be covering in class (ecology, taxonomy, energy hierarchy, human interactions.  As students are answering their questions they should learn to reference important work that has already been done in this field, and they should know how to reference it correctly depending on which media they attain their information from. The links below will help students 1) reference correctly the material they find for their paper, 2) See the specific style of writing they should follow  <http://www.apastyle.org/elecsource.html#77>. <http://library.osu.edu/sites/guides/apagd.html>  While writing this paper, students should bring an overall statement of what the purpose of the paper is; Ex. The same student who is writing about estuaries and answers important questions about it is ultimately trying to do what?  --inform the readers the importance of estuaries to both organisms and humans  --educate readers on how humans are severely impacting estuaries  --educate readers the organisms that are housed in these environments and why they live there  --inform the readers of the basic make up of an estuary and all its important components  ETHICS:  When writing a research paper, students should know/learn that they cannot use someone else’s material without giving them proper credit (referencing) in their paper. They should use their own words and thoughts. Every paper should include a reference/paper cited page that lists all the sources from which you took material and used in your paper or mentioned in your paper. Students may have looked at 10 websites, but if they only took information from 3 of them, then they only need to cite/reference those 3.  Students need to be specially careful of electronic resources and their reliability, Ex. a student doing a paper on estuaries must be careful if they come across a website from an oil company that mentions the importance of drilling for oil in estuaries, and that they are very important ecosystems for other organisms. – this is a bad reference since the oil company is extremely biased and are out to push their agenda, once must be careful with such references.  The ability to understand how to write a research paper will help the students for their group project presentation. Researching good references for their projects will be an important step in making sure their presentation are well done and relay the proper information. |