### Assessment of Course Student Learning Outcomes

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<th>Degree or Certificate SLOs Assessed</th>
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<td>Gen Ed SLOs</td>
<td>Which are being measured?</td>
<td>- What do students have to do to show achievement of the SLO(s)?&lt;br&gt;- What are the various projects or tasks that will be used to assess the SLO(s)?&lt;br&gt;- What is your benchmark?&lt;br&gt;- How do you know if the SLO has been achieved successfully?</td>
<td>- What strengths did the assessment identify?&lt;br&gt;- What areas can be strengthened?&lt;br&gt;- How did the materials and instructional methods affect the achievement of the SLO(s)?&lt;br&gt;- How will your proposed actions lead to the achievement of the SLOs?</td>
<td>- What changes, if any, do you plan to make in your material or instructional approach in response to the results of the assessment and your analysis?</td>
<td>- How much will your proposed actions cost the department or college?&lt;br&gt;- Will the actions require resource allocation?&lt;br&gt;- Provide a cost estimate in personnel and other resources.</td>
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<td>I-VI, X ASC, AA</td>
<td>Distinguish science as a way of knowing from other epistemological systems.</td>
<td>This topic is presented in lecture and integrated with lab activities. In lecture students learn that the scientific method comes from observations that are quantifiable, whereas nonscientific approaches do not. Students should answer the following questions correct 70% of the time.</td>
<td>The questions identified students comprehension of the scientific method as well as distinguishing it from a nonscientific approach. Students were successful answering question 2-5,70% of the time. Students results are on target, but they could do better. Students are asked questions pertaining to the lecture. They appear to follow along and can answer questions; however, they do not spend enough time studying or asking questions during review time.</td>
<td>I have made a jeopardy game to use for exam review. My belief is that students are afraid to ask questions or that they put little time in studying. A game that tests their knowledge before an exam may get them to realize their deficiencies and to increase their study.</td>
<td>No funds are necessary.</td>
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### Exam 1:

2. What is the correct order of steps used in the scientific method?
   - A) question, observation, hypothesis, testing, analysis, conclusion
   - B) observation, question, hypothesis, testing, analysis, conclusion
   - C) hypothesis, observation, analysis, question, testing, conclusion
   - D) observation, question, testing, hypothesis, analysis, conclusion

3. If a hypothesis is not supported, a scientist should:
   - A) give up
   - B) change the data
   - C) form a new hypothesis
4. In a study on the effect of Drug X on blood pressure, the group that received Drug X were regarded as ______________, whereas the group that received a sugar pill were regarded as __________.  
   A. valid, reliable  
   B. a stratified sample, random sample  
   C. dependant variable, independent variable  
   D. an experimental group, a control group  

5. In the above study, blood pressure is the  
   A) independent variable  
   B) dependant variable  
   C) hypothesis  
   D) principle of parsimony  

I, II, VI, X  
Discuss the historical development of the discipline of biology into what it is today, relating the contributions made by significant individuals and concepts of the past to modern biology.  

Students answered questions 10-15 correctly 75% of the time. No additional changes are necessary. No funds are necessary.
12. Galileo, Leeuwenhoek, and Hooke are known for:
   A) developing a classification system
   B) discovering that the universe is heliocentric
   C) developing the microscope
   D) discovering that Hippocrates theory on the four humors was incorrect

13. Western medicine was founded by:
   A. Wallace
   B. Ptolemy
   C. Hippocrates
   D. Lyell

14. Little new knowledge on human body was produced during the Dark Ages (200-1200 A.D.) because:
   A) church views dominated
   B) Taboo against using cadavers
   C) Teacher’s didn’t get physically involved in making observations
   D) Galen’s textbook prevailed
   E) All of the above

15. In 1915, a book by __________ proposed the hypothesis of continental drift.
   A) J. Tuzo Wilson
   B) Harry Hess
   C) Robert Scott
   D) Alfred Wegener
   E) Edward Teller

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I, II, III, IV, VI, X

Explain the major integrating principles of biology.

This topic is presented in various lectures. Students need to answer the questions 70% of the time. **Exam 2** major principles of biology:

14. The role of an organism within the community is its _________.
   A) niche
   B) habitat
   C) food chain
   D) trophic level

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Students answered questions 14 & 15 correctly 80% of the time. Students answered question 48 correctly 90% of the time.

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No additional changes are necessary.

No funds are necessary.
15. In the first trophic level of an ecosystem, one may find:
   a. primary producers
   b. photosynthetic organisms
   c. chemosynthetic autotrophs
   d. all of these

**Exam 5:**
48. Which of the following organisms carries out cellular respiration?
   A) a corn plant
   B) a dog
   C) a yeast
   D) a bacterium
   E) all of the above

I, II, III, IV, VI, X

| Explain the origin and organization of the diversity of life on Earth. | This topic is presented in lecture. Students need to answer the questions 70% of the time. | Students answered question 20 correctly 90% of the time. Students answered question 38 correctly 70% of the time. | No additional changes are necessary. | No funds are necessary. |

| Describe how living systems function, relating structure to function, at all levels within the | This topic is presented in lecture. Students need to answer the questions 70% of the time. | Students answered question 5 correctly 70% of the time. | No additional changes are necessary. | No funds are necessary. |
hierarchy of life from molecules to the biosphere.

Exam 2:
5. The biotic (living) and its interaction with its surrounding abiotic (nonliving) environment makes up the
A) ecosystem
B) biosphere
C) population
D) community

I, II, III, IV, VI, X

Solve problems in inheritance and genetics.

This topic is presented in lecture and lab.

Students conducted a lab activity involved in forensic investigation. Students learn about DNA and uses of DNA in forensic investigations. One component of the lab is to understand how a person's blood type is inherited as well as race related. Students need to identify the suspect who committed a fictitious murder by identifying blood types. This assignment was not graded.

Students were able to follow the lesson and all succeeded in a chemical analysis of blood types. The murder suspect was determined.

No additional changes are necessary.

No funds are necessary.

I, II, III, IV, VI, X

Present informed, rational and objective opinions on biologically-related issues important to human society.

Students have numerous lectures that related to biological-societal issues. They are asked to discuss these issues and express their opinion in lecture and lab. Students need to answer the following questions 70% of the time.

Exam 3:
34. In March 2006, Honolulu dumped 24 million gallons of raw sewage into the Ala Wai. Increased levels of nitrates and phosphates in the water can result in
A) algal or phytoplankton bloom
B) anoxic water conditions

Students answered questions 34, 39, 41, & 50 correctly 70% of the time. The exam questions relate to a lecture and a video, "Empty Ocean Empty Nets", on the mismanagement of our fisheries. I provide students with a worksheet that they do while they watch the video. The worksheet is reviewed after the video and they use this as a study guide for the exam.

No additional changes are necessary.

No funds are necessary.
C) fish kills
D) algae smothering corals
E) all of the above

39. An unsustainable fishery practice used to catch cod is done by
A) bottom trawl
B) purse seine
C) gill net
D) hooks and lines

41. All of the following relate to reasons why over 75% of marine fisheries been overharvested except
A) Biological information often outweighs economic, political, and social decisions.
B) Economic, political, and social decisions often outweigh biological information.
C) Technology moves at an accelerated pace where the fish can’t hide from being caught.
D) Globally, fisheries are not well-managed and the catch often exceeds the maximum sustainable yield.
E) Juveniles and small fish at the low end of the food chain are regularly caught.

50. What is the Great Pacific Garbage Patch?
A) a phenomenon caused by global warming
B) a huge area of accumulated marine debris, mostly small plastic particles, floating at or below the water surface
C) an international dumping ground for boats and cruise ships
D) the outer Northwest Hawaiian Islands

I, II, III, IV, VI, X

Use the scientific method of inquiry to investigate biological phenomena.
The scientific method of inquiry to investigate biological phenomena is done in the lab. For instance, in the first lab, students conduct a diffusion experiment. They need to form a hypothesis, test it and see if their
All students succeeded in the diffusion lab.
No additional changes are necessary.
No funds are necessary.
| I, II, III, IV, VI, X | Apply the concepts learned to an experimental and hands-on observational setting. | Four lab activities were experimental designs; the remainders were observational. For instance, students need to observe and identify campus birds, make a drawing in their field book, and write their behavioral observations. The field book was graded for following instructions, identifying the birds correctly, and keeping a proper field book. The benchmark is 80%. | Students succeeded in the bird observations 80% of the time. Some students, however, submitted the assignment late and did not follow instructions. An example of the field book requirements is provided and instructions just need to be followed. | No additional changes are necessary. | No funds are necessary. |
| I, II, III, IV, VI, X | Collect, reduce, and interpret biological data. | This is done is several lab activities. In one lab, students have to gather information on a particular fishery and use the data to help manage it without going over the maximum sustainable yield. Students are graded on the ability to follow directions, use the computer simulation, interpret the data and make recommendations on the fisheries Management Plan. The benchmark for this activity is 80%. | Students succeeded in the fisheries 80% of the time. | No additional changes are necessary. | No funds are necessary. |
| I, II, III, IV, VI, X | Prepare written objective reports describing and interpreting experimental and observational results. | This is done is several lab activities. Students report back on an analysis of AZA requirements at either a AZA accredited zoo or botanical garden. They have five criteria to identify and evaluate: 1. quality of the living area. 2. high level of enrichment and care 3. involvement in conservation 4. active education programs 5. esthetics. | Students achieved 80% on AZA reports. | No additional changes are necessary. | No funds are necessary. |
Demonstrate the use of some of the standard tools and methods of the biological scientist, such as microscopes, scales, spectrophotometers, computers, dissection dichotomous keys, and other analytical tools.

Students have various lab activities, such as a cells lab and plankton lab where they use microscopes and learn practical laboratory techniques as well as being safe in a lab. 20% of their lab grade is derived from participation, which includes using equipment properly, safety, working together in a group setting, and cleaning up. Students whose absence was unexcused lost out on participation points.

Students have a plants lab where they have to identify plants using a dichotomous key. The benchmark for this activity is 80%.

Students answered question 30 correctly 70% of the time. Students completed the classification lab assignment 100%.

Identify the major systematic groups to which specimens of living things belong.

This topic is presented in lecture and lab. Students need to answer the questions 70% of the time.

Exam 1 classification:
30. According to the binomial system of nomenclature, the *Fungia* in *Fungia scutaria* refers to the _________ name.
A) species  
B) family  
C) genus  
D) class

Students have a lab activity related to classification. They learn to identify a

Students completed the classification lab assignment 100%.

No additional changes are necessary.

No funds are necessary.
Students will take a sample of animal specimens by their taxonomic affiliation and place each one in their appropriate phylum by their physical traits. Students will make a cladogram to be turned in for a grade. Students need to obtain 80%.

In the plankton lab, students have to make observations using the microscope, identify, draw and classify their specimen. Students need to obtain 80%.
BIOL 101 Extra Credit Reaction Paper

SUPERSIZE ME (Reaction):

I always knew about this movie hearing it from my mom, relatives and friends but I never actually watched it for myself. Actually having the opportunity to watch this in class was very interesting. I, myself, don't eat a lot of fast foods in general but learning about one in particular, McDonald's, made me think that's just one of the many different food chains around the world that nobody knows what goes on in the background.

To watch this guy eat McDonald's everyday for a month, 3 times a day (breakfast, lunch & dinner) was very disgusting, but seeing the change in his personal health and behaviors was very interesting. To gain about 25lbs in over 4 weeks from eating that kind of food was ridiculous, and to see each doctor's reactions to this experiment shocked me, for the results were true yet horrible. McDonald's as well was clearly shown as the bad guy with corporate no help, but yet could not be shut down because it's people's decision to buy it and consume the product.

After watching it, I continue to not eat fast food so I don't have to think about how things are made and just what happens in the back scenes of a fast food chain. To think even the salads were bad and they are worst than burgers was scary, never ate their salads but was so disgusting that i don't recommend my children to not eat fast food on a weekly basis in the future. But the bright side to watching this made me go to the gym right after and cook my own food.
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<td>What areas can be strengthened?</td>
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#### Assessment Results & Analysis*

- What strengths did the assessment identify?
- What areas can be strengthened?
- How did the materials and instructional methods affect the achievement of the SLOs?

*Attach artifacts: summary of results, sample test, rubric, presentations, or relevant materials used to assess the SLOs

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**I, II, III, IV, VI, X**

To develop a practical understanding of biological principals.

Students received 80% as a final lab grade. Some of these labs were new and need small modifications. Overall, students were motivated to learn and the benchmark for the course was achieved.

I will extend the plant lab to include a Geocaching activity, mapping plants on campus. This lab extension will provide an opportunity for students to use GIS technology and provide the WCC community with a motivational way to learn campus plants and their historical significance.

**I, II, III, IV, VI, X**

Use the science methodology to define and solve problems independently and collaboratively.

Students work in groups during lab activities, but often have outside assignments that need to be conducted independently. Students

Students received 80% combined for participation and homework.

No additional changes are necessary.

No funds are necessary.
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<th>Use a wide variety of laboratory and field techniques with accuracy, precision and safety.</th>
<th>Students use basic laboratory equipment such as microscopes, droppers, and forceps. They are trained on all equipment prior to use. The instructor monitors activities and provides further instruction when students have difficulties. One of the most important techniques is taking accurate notes in the field and using a lab notebook properly. The benchmark for the lab notebook is 70%.</th>
<th>Students followed directions for the lab notebook at 70% success.</th>
<th>The benchmark might be raised if students have an example of a good quality lab book to observe.</th>
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<td>I, II, III, IV, VI, X</td>
<td>Accurately interpret biological information.</td>
<td>All labs have biological information that needs to be accurately interpreted. The benchmark is achieved from homework assignments at 80%.</td>
<td>Students received 80% for homework.</td>
<td>No additional changes are necessary.</td>
<td>No funds are necessary.</td>
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<td>I, II, III, IV, VI, X</td>
<td>Demonstrate proficient library, mathematical and computer skills in data gathering and analysis.</td>
<td>Students have a mathematical assessment worksheet that is done in groups to review the metric system and basic scientific interpretation during the very first class.</td>
<td>Students are proficient at basic mathematical calculations and using the computers. They were successful 100% of the time.</td>
<td>No additional changes are necessary.</td>
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For example, one item has students converting from km to other units.

24. Convert 168 km = ______m = ______cm = ______mm = ______µm

This worksheet is reviewed in class and not graded.

Students use computer for more than 50% of lab activities. They use the computers for modeling systems and doing research. The benchmark for the math worksheet is 100% and for using the computers 100%.

| I, II, III, IV, VI, X | Apply scientific concepts to environmental and societal issues. | At the beginning or end of a lab, students are asked reactionary questions based on their current knowledge and knowledge they gained during lab activities on environmental and societal issues. In a biodiversity lab, students are presented with an ethical dilemma used to open up a discussion. For example:

What happens when disease eradication takes a high toll on biodiversity? | Students achieved 100% for applying scientific concept to environmental and societal issues. | No additional changes are necessary. | No funds are necessary. |
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<td>I, II, III, IV, VI, X</td>
<td>Apply their learning in an off-campus professional setting.</td>
<td>Participation is graded at 10% of their overall lab grade.</td>
<td>Participation is expected.</td>
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<td>Students have several lab activities that need to be conducted outside of class time. For instance, in a biodiversity lab, students need to use AZA criteria in evaluating places like a zoo or botanical garden. Homework assignment make up 80% of their overall lab grade. The benchmark for this assignment is 80%.</td>
<td>Students received 80% for homework.</td>
<td>No additional changes are necessary.</td>
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<td></td>
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