

Biology SLOAC work

Course/Service ID	Student Learning Outcome (SLO)	Assessment Method	Assessment Data Summary	Reflection and Analysis	Enhancement/Action
BIOL 10	Apply principles of the scientific method to every day problems and develop potential plans for solutions.	Evaluation of student responses for 2 select questions on Exam #1 regarding the utilization of the scientific method.	The first question on the scientific method: 80% scored correctly. On the 2nd question regarding the scientific method: 85% scored correctly.	This SLO captures a foundational biological concept emphasized in all introductory biology courses. This material is taught in both lecture and laboratory settings with repetition throughout the course. The SLO is valid and the 75% target is being met.	In addition to the exam questions, a written homework assignment regarding the utilization of the scientific method in everyday life will be added.
	Demonstrate an understanding of the impacts of human activities on the biosphere.	Evaluation of student responses for 1 select question on Test #3 regarding human impacts upon the biosphere.	For the question regarding human impacts on the biosphere, 80% of the students correctly answered the question.	This SLO captures a foundational biological concept emphasized in all introductory biology courses. This material is taught in both lecture and laboratory settings with repetition throughout the course. The SLO is valid and the 75% target is being met.	In the future, a written research assignment may be incorporated in order to enhance student understanding of this topic.
	Evaluate the correlation of structure and function in plants and animals.	Evaluation of student responses for 2 Select questions on TEST # 1 regarding structure and function of animal cells and plant cells.	The question on plants: 86% scored correctly and for the question on animals: 80% scored correctly.	This SLO captures a foundational biological concept emphasized in all introductory biology courses. This material is taught in both lecture and laboratory settings with repetition throughout the course. The SLO is valid and the 75% target is being met.	Keep the SLO and diversify how it is measured to include lab assessments.
	Identify and explain the characteristics of life.	Evaluation of student responses for one select question on TEST # 1 regarding the characteristics of life.	77% of the students answered this question correctly.	This SLO captures a foundational biological concept emphasized in all introductory biology courses. This material is presented and discussed primarily in lecture. The SLO is valid and the 75% target is being met.	Keep the SLO. Incorporate this concept into lab activities or discussions.
BIOL 11	Investigate the forms and functions of selected human organ systems from the molecular/cellular level to homeostasis at the organismal level.	I emailed enrolled students the week before the start of the quarter and instructed them to complete an electronic survey before coming to class. As part of the survey, students were instructed to respond to three essay questions based on their	For question one, students on average increased their scores by 4 points from the start to the end of the class, and for question two, students on average increased their scores by 7 points from the start to the end of the class. These are	I was incredibly pleased with these results, not only because students scored highly at the end of the class, but more importantly because my data shows students significantly changed their understanding of biology from the start to the end	I will continue to use these assessment prompts, because they have the ability to show conceptual changes in students, and because they yield interesting misconceptions to address in class. In the future, I will use quotes from students?

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BIOL 11	Investigate the forms and functions of selected human organ systems from the molecular/cellular level to homeostasis at the organismal level.	prior knowledge. Two of those three questions were connected to this SLO. One of the questions read "Your NERVES and your GLANDS serve a very similar purpose in your body." To what extent do you agree or disagree with this statement? Why?? The other prompt asked students to place some genetically and environmentally determined traits in the order they happen in the development of a baby, and explain the reasoning for the order. Students responded to these same essay prompts on the last day of class, so I had paired pre-class and post-class data for my students. I used the same grading keys for both the pre- and post-assessments, and analyzed 1) the extent to which students changed their scores from before to after the class, and 2) the average class scores before and after the course.	quite large improvements in scores, given that the questions were worth only 8 points and 12 points respectively. 100% of students improved their scores on the second question and 48 students out of 49 present improved their scores for the first question. The class average for question one increased from 29% to 76% from pre- to post-assessment. The class average for question two increased from 16% to 78% from pre- to post-assessment.	of class. Even more interestingly, the pre-assessment essay responses on the development of a baby showed numerous fascinating misconceptions about biology and genetics. For example, many students commented that a person's sex is determined by hormones released by the mother or by something the mother does during pregnancy. Many other students voiced the idea that all humans begin as females and then some change to males!	pre-assessments as discussion prompts when beginning genetics and reproduction. This will help directly confront students' misconceptions and will hopefully make even higher post-assessment scores possible in the future.
	Use scientific reasoning to evaluate the biological principles underlying current human health dilemmas, such as the causes of disease, use of biotechnologies, management of epidemics and public health, ecological/environmental health, and social health inequities.	I emailed enrolled students the week before the start of the quarter and instructed them to complete an electronic survey before coming to class. As part of the survey, students were instructed to respond to three essay questions based on their prior knowledge. One of those three questions was connected to this SLO, and it read "There are NOT currently any DNA technologies that treat human diseases, but researchers hope to discover some in the future. To what extent do you agree or disagree with this statement? Provide examples to support your opinion." Students also	On average, students increased their scores by 5 points from the beginning of the course to the end of the course. This is quite a substantial improvement, since only 14 points were available on this essay question. Only 3 students out of 49 present did not improve their scores from the start of the class to the end. The class average score for the pre-assessment was a 16%, whereas the class average score for the post-assessment was a 54%.	I was really pleased with how dramatically most students improved on this essay question from the start to the end of the class. Most students scored 0 or 2 points out of 14 on their pre-assessment, and could describe at least one biotechnology with an acceptable level of biological detail at the end. On the other hand, the class average at the end of the class was not as high as I would like. I think there were some technical reasons for this, which I discuss in the enhancement/action plan.	I will continue to assess this SLO using this essay prompt, but I plan to change my methodology in a few ways. For one, I think I will add another related essay question to get more information on students' concepts in this area. Also, I will administer the post-assessment differently, and will change my grading rubric. After discussions with colleagues, I realized that my grading rubric was far more rigorous than what instructors are using in other, more advanced classes. If I apply a more realistic, but still rigorous rubric, my students would have far exceeded my desired

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BIOL 13	Critically review and differentiate the way in which nutrients are processed to perform various functions in marine plants and animals.				
BIOL 15	Evaluate ecological principles using California organisms.				
	Evaluate the impact of human behavior on California ecology.				
BIOL 26	Compare and contrast the shape, structure, nutritional and environmental requirements of bacteria, viruses, protozoa and fungi.				
	Evaluate and demonstrate the importance of aseptic techniques when working with microorganisms.	The assessment tool I used to assess this outcome was a rubric. If the technique was completed without any errors (all criteria addressed), the resulting score was 12 points. Points were lost as errors were made.	Yes, my students did meet my expectations. 28 students were tested. Twenty three students were able to complete the process at the Exemplary level. All students were able to complete the procedure with at the most minor flaws.	I was pleased with the ability of the students to perform the technique successfully without contamination. There were more successful students in this group compared to last year's group. The change I made this year was to watch the students performing the procedure on more than one occasion which gave them twice the amount of critical input than the students received at the first implementation of the SLO's.	The students that did not receive the total points (12), will be required to practice each class period until they can complete the process successfully. The instructor will continually observe the student's progress.

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	Investigate host parasite relationships and assess their positive and negative impact on the participants.				
BIOL 40A	Demonstrate the scientific method as employed by health professionals to evaluate real-world problems involving the skin, skeletal, and muscle systems.				
	Infer the homeostatic reactions of skin, skeletal, and muscle cells and tissues in reaction to external or internal changes in conditions.				
	Investigate the roles of molecules, organelles, and cells				

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	in the function of skin, skeletal, and muscle tissues.				
BIOL 40B	Apply the structural organization of the the nervous system to how it processes information.				
	Appraise the role of the cardiovascular system in maintaining homeostasis.				
	Demonstrate the ability to apply basic knowledge regarding the structure and function of the respiratory system to predicting its responses in maintainng homeostasis.				
BIOL 40C	Appraise the role of the lymphatic and immune system in the body's defense to disease.				
	Generalize the way in which nutrients are processes to perform various energetic and structural functions in the body.				
	Integrate the structure and function of the kidneys in the regulation of fluid, electrolyte, and pH balance.				
	Predict the homeostatic responses of the endocrine system to internal and external changes or stimuli.	Small group In-class exercise involving graphing and analysis of data. Completion of follow-up questions designed to determine if the students understand the experimental results and if they are able to explain these results using previously studied information.	The average score on this exercise was 4/5. 32/78 students (41%) scored 5/5 12/78 students (15%) scored 3/5. No students scored below 3/5.	Difficulties students had included: Problems with graphing and data analysis Understanding /application of the concept of negative feedback	Review of graphing and basics of negative feedback prior to exercise.
BIOL 45	Demonstrate a coherent understanding of the relationship between diet and the major chronic diseases.				
	Evaluate a meal plan or diet for meeting the criteria of a " healthy diet."				
BIOL 5	Assess the impacts of human				

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BIOL 5	activities on the diversity and populations of birds.				
BIOL 54G	Define the characteristics of life and demonstrate an understanding of how homeostatic mechanisms are important to survival.				
BIOL 54H	Distinguish between the functions of the skeletal system and the muscular systems and evaluate the interrelationship of these two systems in producing movement.				
BIOL 54I	Apply principles of homeostasis and distinguish between the mechanisms that regulate hormones and cardiovascular function.				
BIOL 54J	Evaluate the anatomy and general functions of the human digestive system.				
BIOL 6A	Analyze and compare the process of homeostasis as applied to common physiological processes across higher taxonomy.	Several selected exam questions specifically targeting student achievement in analyzing and comparing the processes of homeostasis as applied to common physiological processes across higher taxonomy. Successive exams over the course of the quarter continue assessing application of these skills to alternative examples of physiological processes and taxonomic groups.	Class scores on these targeted questions exceed the overall class scores on these exams.	Current instructional methods and resources are adequately achieving these learning outcomes. It is always beneficial to seek new examples of physiological processes and organisms to use to demonstrate homeostasis.	Incorporating an outline system of homework assignments to expand the exposure throughout the quarter of each student to broader examples of physiological processes and organisms to demonstrate homeostasis.
	Apply the principles of the scientific method to critique case studies in comparative biology research.				
	Contrast the Linnaen traditional phylogenetic and cladistic processes of taxonomy.				
BIOL 6B	Demonstrate the ability to use appropriate molecular biology	Lab exam questions.	Class average of 80% correct on lab exam concept questions.	Most students are meeting this objective.	Continue with current approach.

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BIOL 6B	techniques to answer research questions and to interpret and explain the results.	Lab exam questions.	Class average of 80% correct on lab exam concept questions.	Most students are meeting this objective.	Continue with current approach.
BIOL 6C	Design and compute an independent ecological research project.	The assessment tool that I used was a rubric. 150 points were possible. Students were graded on content (data collection, analysis, and report of findings), oral presentation, poster aesthetics, and their field notebooks.	Score/150 students 130.07 135.012 140.00 145.04 150.022	Students performed very well on their projects. Everyone earned passing grades, and most students earned A's. Although the projects were very well done, I would like to see more clarity on the students' presentation of their statistical analysis.	I will modify the assignment slightly by improving my instructions. We do several labs in preparation for this project, so my instructions will include references to the statistical analyses we did in those labs.
BIOL 8	Appraise the biological processes unique to women and how these processes are affected by the social context in which they live. Count:37			Count:13	