

Submission Form for ELO Samples

ELO Title: Evolution in Action

School: Winnacunnet High School

Essential Question: How can I implement my knowledge of Evolution into day to day lab procedures for high school freshmen in Biology Honors?

Area(s) of Study: Science/Biology

Amount of credit earned: The student’s work on this ELO spanned two years for a total of 6 credits

Description: I am going to assess the materials needed for the rescaling of the Evolution-In-Action curriculum, a unit created by the University of New Hampshire. This project was run with the help and resources of UNH in previous years, but funding collapsed. Once the new amount of materials is determined, a new protocol and lesson plans will be written to reflect the changes in the program (material amounts, tweaks to the curriculum). I will try the new protocols behind the scenes before they are implemented with students - any problems I find with the protocol will be changed to ensure the best experience possible for the students. In February in the weeks before vacation, I will implement the protocols by preparing materials and teaching the evolution lessons to students. My final product will be a comprehensive guide of how I redesigned and downsized the project, so teachers and students across the country can teach using this real-world science, student-to-student model.

Competencies:

Short description	Full text of competency
Content Specific Competencies	
Evolution	Student will demonstrate an understanding of evolution through natural selection by researching and examining various contributions to the scientific theory of evolution and examining the process of natural selection.
Biotechnology	Student will demonstrate an understanding of current innovations in medical biotechnology by researching and analyzing current implications of biotechnology on health, healthcare and quality of health, including pharmaceuticals.
Science Department Competencies	
Scientific Literacy	A scientifically literate student is able to apply their knowledge of scientific concepts and processes to the evaluation and presentation of issues that arise and to the decisions that they make in their daily life, about the natural world and changes made to it through human activity.

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Facility with Knowledge	The ability to critique and apply facts, information, and skills acquired as defined by the discipline and grade level expectations.
Scholarship	The demonstration of responsible behavior, preparedness, and perseverance in the pursuit of scientific knowledge and understanding.
WHS School Wide Learning Expectations	
Communication	Student uses various media to interpret, question, and express knowledge, information, ideas, feelings, and reasoning to create mutual understanding.
Creativity	Student uses original and flexible thinking to communicate ideas or construct a unique product or solution.
Collaboration	Student works in diverse groups to achieve a common goal.
Self-Direction	Student initiates and manages personal learning, and demonstrates a “growth” mindset, through self-awareness, self-motivation, self-control, self-advocacy and adaptability as a reflective learner in order to develop personal goals
ELO Department Competencies	
Research	A student participating in an ELO analyzes and demonstrates an understanding of his/her learning experience through reflection.
Reflection	The student applies the ongoing research of the ELO experience to the evaluation and presentation of issues that arise, and the decisions made as their experience progresses.
Product	The ELO student demonstrates his/her gained knowledge and applies an understanding of what they learned by developing a tangible product that relates to his/her interests, skills, and abilities.
Presentation	The student clearly communicates the entire ELO experience, including both the process and the learning, in a manner that is appropriate to the experience and the audience.

Student Activities (up to 10):

1. Research funding opportunities to buy an autoclave (bacteria sterilizer). Conduct preliminary research about rebooting the Evolution in Action program.
2. Start of emails between community partners about material preparation and student protocols
3. Communication with Fisher Scientific, ordering necessary supplies
4. Adjustment and creation of student protocols and creation of materials
5. Behind-the-scenes trial period of protocols
6. Necessary adjustments made to student protocols after trial
7. Creation of necessary materials for student implementation
8. Creation of lesson plans for entire Evolution-in-Action unit
9. Student implementation

- a. Teaching of evolution principles
- b. Day-to-day transfer of bacteria
- c. Examining plated bacteria and subsequent mutants

School Partners:

- Two Winnacunnet High School Biology teachers
- ELO Coordinator

Community Partners:

- Director, Center for Evolutionary Biology and Medicine at the University of Pittsburgh, School of Medicine
- Research Technician - University of Pittsburgh
- Science and Technology Department at Windham High School
- PhD Student Molecular and Evolutionary Systems Biology at the University of New Hampshire
- Fisher Scientific

ELO Partner responsibilities in this ELO:

The two high school teachers teach the Biology course that includes this unit. They have acted as the student's mentor through the entire process. They were primarily responsible for meeting with the student on a daily basis as well as primarily responsible for the student's assessment

The community partners ranged from professors to vendors. All have been mentors in varying capacities. Communication with these community partners was through email, phone or in person as necessary.

Assessment:

Student was responsible for regularly checking in with his mentor teachers for reflection.

The final product of the ELO is a binder containing all of the information necessary to run the protocols at another school. This will include all communications had with representatives from supply companies, and mentors from UNH and PITT. Also in the binder will be the student protocols and lesson plans for the Evolution-in-Action unit. Also included are any other resources that generated along the way.

There is a video created about the experience by a partnering student on the ELO project.

The student's final presentation included the entire ELO experience from planning to assessment as well as a discussion of the successes and challenges faced and how this ELO experience helped the student move forward in high school and college. The presentation was to the League of Innovative Schools in Feb 2017. This included a question and answer segment as well as the League members observing one of the classes. No special equipment or facilities are needed other than the classroom, and a spare room for the questions.

Another part of the student's presentation was conducted at New England Secondary School Consortium conference on High School Redesign.

Connection to student's measurable postsecondary goals (for students with IEPs):

N/A

Comments and suggestions for other schools implementing a similar ELO:

The design of this ELO ensures the student not only develops the protocols/curriculum but also helps to teach it. Through teaching, future students interested in the ELO are recruited to take on the role of teacher/student mentor the following year.

Willing to be contacted by another school interested in developing something similar to this?

Yes! Contact me through email at dcouture@warriors.winnacunnet.org.

Supporting material included. List and briefly describe:

- [ELO Design Plan](#)
- [Evolution in Action student packet](#)
- [Link to google folder with all student work and pictures](#)
- [Link to video made of the project](#)
- [Powerpoint presentation for League of Innovative Schools that included the student's portion](#)

Photos or student work submitted:

Yes, permission is granted to use these on the BeyondClassroom website. (DC)