

## Education Proposal Template

Name: Ms. Smith

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What year did you participate in the Teacher's Workshop? 2018

Have you participated in Students on the Beamlines before? No

If yes, how did you build on your experience with us in your community with your colleagues or students? (150 words)

When would be the ideal time for your beamtime to be scheduled?

My ideal time for beamtime would be in the spring of 2020, particularly at the end of May but I am flexible.

How many students do you anticipate bringing to CLS? 10

How many supervisors (including yourself) do you anticipate coming to CLS? 2

**Funding Request (~max 150 words)** (please refer to the proposal information package)

I will need funding support for travel and accommodations. We are planning to get a bus and to stay at Ogle Hall.

## **Proposal – Please Refer to the Rubric for Additional Guidance**

**Team Description (~max 250 words)** (please refer to the proposal information package)

I am a Biology 30 teacher and want to involve an entire Biology 30 class for this project. I understand that it would be difficult to take 25 students to CLS, so I anticipate to bring 10-15 but will incorporate all students in the process. Hopefully students self select who will come to CLS. I hope for my class to have students who are motivated, curious about science, and have a variety of abilities to contribute to a strong team such as presentation skills, academic strength, computer aptitude, leadership, artistic skills, etc. Having an opportunity for students to participate in real science is something I want to expose them to as it will show them what science is outside the classroom and hopefully they will be able to determine if that is something for them or not. My school is culturally diverse, so I am certain that my group will reflect a mixture of different genders and cultural perspectives. Once a science topic is chosen, students will be made aware of connections that I have with teachers and professionals in the school community, at the University of Saskatchewan, and other professionals in the community that relate to the topic. This way students will have the option to search for mentors to include to their team. Who the students approach and how many mentors there will be, will depend on which Biology 30 topic the students would want to investigate. My team will consist of myself, my students, and additional mentors.

**Outcomes for the Team (~max 250 words)** (refer to the proposal information package)

Throughout the process I expect the team members to be able to work together, gain confidence, communicate, understand the science process, and be able to share their findings. I want to include my entire class so my students understand the concept of collaboration, the importance of sharing their findings, and working as a team especially when some students will not be able to come to CLS. I hope that all my students will learn what it is to be a scientist – how to delegate tasks, present their findings, collaborate, and manage their time and resources (science and community mentors).

This is a new approach of teaching for me. I have tried different student based learning techniques in the classroom, but have not participated in a collaborative project with my students so this experience will also be a learning opportunity for me. I am planning to have this particular Biology 30 class be a student driven class with this project anchoring the course while I supplement other curricular outcomes throughout the semester. The class as a whole will choose a topic, look at literature and engage additional resources (mentors) to develop a scientific question, gather or create their samples, do classroom experiments, conduct a synchrotron experiment (hopefully), analyze and synthesize all data and present their findings. I have arranged with my colleagues at school that students in this course will be able to use their work here in assignments for credit in other courses. For example, students also taking Physics 30 can choose to develop a presentation explaining the light and optics concepts of the synchrotron and of their beamline for which they will receive credit. If their chosen project lends to chemistry experiments, the Chemistry 30 teacher is willing to provide support and integrate those experiments into her course as well. This will help to emphasize the collaborative and interdisciplinary nature of synchrotron research.

Throughout the process I will be the one to facilitate and guide the students – making sure everyone is engaged, has something to do, and are on task. The key component for me is to make sure everyone is collaborating and that everyone is up to speed with everything at certain points of the process.

Students will create a scientific poster for CLS, and it will also be on display at our school. In addition, a presentation of student results will be given to the classes whom we collaborated, and at our school's science fair to which the parent community is invited. Each group will also be challenged to explain their experience to different audiences (very young, elderly or public for example) in a different format – video, dance, statistics, puppet show, poem, short story, a game, etc. It will depend on the group's interest and what they want to do. This I feel brings a cross curricular connection and hopefully shows the students that science is more than just science and can be connected with other classes.

**Broad Impacts (~max 350 words)** (please refer to the proposal information package)

The Biology 30 class that I will be teaching is reflecting the new Biology 30 curriculum, this is the introductory year and I am on the curriculum development committee. I view this as an opportunity to show my colleagues a different way of delivering this curriculum. I have the support of the division Science Consultant and we wish to show I did meet the outcomes and was able to provide a student driven teaching focus classroom with the help of Student on the Beamlines.

The science work these students are engaging in will be highly visible. They will be making presentations in several classrooms; their poster will be on display; they will present at the school information day; and will be planning for several community presentations in relation to their chosen method of sharing. This is unusual in my school and in my community. It will capture attention and with the idea that these students will be pursuing 'real' science, it will demonstrate alternative ways of learning about science and, hopefully engage the attention of those who tend to be less interested. I will plan on including media outreach as an end goal for the students. Students can plan how they want to present their experience and findings in media but I will suggest local newspaper, radio, social media, and writing an article to be published.

Being that this is a new approach of teaching for myself, I am planning to also reach the teaching community and letting them know about my experience. I plan on having a presentation on the pedagogy ready for my schools teacher meeting, and also send information to the school board to see if I would be able to share what I learned through a Professional Development or at a conference for science teachers. I have social media connections with various science teachers in the city and province, and plan on writing an article to share my experience on there. There is also a newsletter that is handed out to each school in the school board, I plan on sharing what I learned and my experience in there as well.

**Science Topic (~max 150 words)** (please refer to the proposal information package)

\*\*\*It is required to include a scientific idea or ideas for your educational proposal. We are NOT looking for an experimental plan or project design.

The Biology 30 class that I will be teaching is an introductory of the new Biology 30 curriculum. The driving questions for this class are “What is life and how do organisms change over time?”, “How does evolution lead to unity and diversity within living things?” and “How does life store, transmit, and respond to information?” These will be the questions that my students will use as a starting point for their topic. The focus of the Biology 30 class is for students to be able to understand the nature of life, patterns in evolution, biological and biotechnological implications, cellular structures and processes, biological classifications, compare anatomy and physiology of living things, and genetics. I would like the students to pick a questions that they want to investigate that relates to the curriculum. I plan on suggesting using plants, algae or bacteria as it would be easier to handle, sample, and bring to CLS. Perhaps the students will look at something else, but I will keep in mind what is doable and what we can't do in the time frame we have and in what samples we can acquire and bring with us to CLS.