

Animal Adaptations Exploration for Fourth Graders

Prospectus for the Capstone project
to be submitted to National University
in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE IN EDUCATIONAL AND INSTRUCTIONAL TECHNOLOGY

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Introduction

This project will be part of an online-learning Animal Adaptations Science Unit for fourth-grade students. The students will engage in a four-week course through Moodle, where they will accomplish both synchronous and asynchronous activities. The course will enhance their learning through high-interest readings and then they will complete follow-up questions and activities.

The goal of the course will be to prepare the students to master the fourth-grade Next Generation Science Standards. Animal Adaptations Exploration for Fourth-Graders will prepare them for the next grade-level science standards and beyond. The Moodle course will also prepare these students to learn about specific animal needs, animal body parts, and animal behaviors. The course will enable students to master the 4-LS1-1 Standard, which is to construct an argument that animals have internal and external structures that enables their survival, growth, and behavior (“4 combined DCI standards,” 2013). Through high-engagement and projects, fourth-graders will become experts in the unit vocabulary and be able to creatively demonstrate an understanding of content.

Educational/Instructional Need

- **Educational Requirement**

This course will meet the California K-12 Next Generation Science Standard 4-LS1-1 Standard: 4-LS1-1, which states that students will “construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction” (“4 combined DCI standards,” 2013). Elementary students are required to be

taught certain science standards and this course will focus on one standard, or strand as the NGSS curriculum calls them. Although the standards have been published since 2013, there is still a lack of curriculum. This course will therefore serve to teach this specific fourth-grade NGSS strand and have students earn at least 70% in the overall course to continue to the next strand.

- **Preliminary Extant Data Analysis**

Although the Next Generation Science Standard website offers a framework for educators to use, there are not many resources that are aligned with the new Next Generation Science Standards.

Some of the resources that are available include:

- Framework and Vignettes from the Next Generation Science Standards Website—this organizational website includes all of the strands and even vignettes for educators to utilize when teaching the standards.
- Curriculum Resources from the California Department of Education—this website has links that may be useful to educators and even parents. However, the information is dry and not tailored for students.
- Mystery Science—is a paid platform that can be used by elementary teachers to engage their students in weekly “mystery question” video-focused lessons that include activities. The platform gears the questions based on the grade-level that the educator chooses. The first year is offered free, but thereafter it is \$99 per year.
- STEMscopes—is a paid digital program that offers PreK through 12th grade curricula based on the new NGSS. Although it is not state approved, it offers one

of the most organized connection with the new science standards. It can be delivered either digitally or printed by the educator.

- YouTube—offers videos that teachers can use to engage students for the 5E model that the NGSS uses as its lesson format.

In many districts, there are few available resources that enable students to master NGSS strands and better prepare them for the further accumulation of the skills in higher grades. This project will enable students to:

- Apply the material learned in the course through discussions and using Web 2.0 tools.
- Create presentations to demonstrate their understanding of animal adaptations.
- Collaborate in specific assignments to analyze animal adaptation vocabulary.
- Distinguish between different animal behaviors, body parts, and needs that enable them to survive.
- Draw connections throughout the four-weeks by being able to recall information through rigorous questions and by being able to provide specific examples.
- Understand key ideas through grade-appropriate text and through engaging lesson videos.

Goal

The goal of this final project is to prepare fourth-grade students with mastery in one strand of the Next Generation Science Standards for Animal Adaptations. According to Colby (2012), “The need for the NGGS is both real and urgent since, over the past 15 years, student achievement has remained stagnant with no more than 30% of students meeting the proficiency mark on the

National of Educational Progress (NAEP)” (para. 3). Furthermore, research by Finn and Porter-Magee (2012) concluded that “In the light of such standards, teachers at each grade level can clearly see where they should focus their time and attention to ensure that their pupils are on track toward college- and career readiness” (p. 4). Also, this course will focus on ensuring that students are equipped with the “Four Cs” to better prepare them to be 21st Century learners. The four Cs are: critical thinking, communication, collaboration, and creativity (“An Educator’s Guide to the “Four Cs,” n.d, para. 4). The four-weeks will enable students to fully immerse in the “Four Cs” through the different activities and assignments. Finally, research by Trowbridge, Bybee, & Powell (2008), states that “When educational technology tools are used appropriately and effectively in science classrooms, students actively engage in knowledge construction and improve their thinking and problem-solving skills.” Therefore, with the use of technology, this online-course will enhance the learning of this specific strand for fourth-grade students.

Audience

The intended audience is fourth-grade students, aged nine to ten. They are enrolled in public school. Students in public education have been exposed to California State Science Standards in their previous grades. Due to new Next Generation Science Standards (NGSS), the students are expected to master all the new fourth-grade standards for science. Currently, there is not a curriculum for the new standards, but students are being introduced to new Next Generation Science Standards during this upcoming school year. Overall, per class, the percentage of males is slightly more than females.

Schedule

Milestone	Target Completion Date	Status/Comments
Planning Document Report	June 17, 20XX	
Completed Literature Review	June 24, 20XX	
Working Prototype of Project	July 1, 20XX	
Aesthetic, Usability, and Content Testing	July 8, 20XX	Test out the site myself and have other classmates as well
Final Draft and Written Review of Report	July 15, 20XX	My goal is to finish ahead due to availability of summer vacation
Completed Project and Report	July 27, 20XX	I intend on giving myself time to test out the website and make changes (Final due date is August 4)

References

An educator's guide to the "Four Cs." (n.d). Retrieved from

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Trowbridge, L. W., Bybee, R. W., & Powell, J. C. (2008). Teaching secondary school science:

Strategies for developing scientific literacy (9th ed.). Upper Saddle River, NJ: Prentice Hall.