CSA 521 Course Syllabus Using Citizen Science Data in the Classroom

Welcome to the course *Using Citizen Science Data in the Classroom*, the newest course offered by the Citizen Science Academy. The course is designed for both K-12 educators and informal educators and will provide you with the tools you need to use citizen science data in an educational setting.

Note: This course assumes you have basic familiarity with the concept of citizen science and have explored at least one citizen science project on your own. Several projects will be highlighted in this course: Project BudBurst, eBird, FrogWatch, Picture Post, and CoCoRaHS. If you are entirely new to citizen science, two introductory courses are available through Citizen Science Academy:

- CSA 501: Introduction to Project BudBurst for Educators (CT-1430 at CSM)
- CSA 520: Intro to Citizen Science: Explorations in Educational Settings (CT-1213 at CSM)

These courses offer background and activities to effectively implement citizen science projects in the classroom and provide a good starting place if you are new to implementing citizen science programs as part your instructional activities. Sign up for these classes at citizenscienceacademy.org.

Each unit of this course contains a combination of readings, videos, discussions, or activities, and a self-assessment. You will also find discussion boards where you can share your ideas (and view other ideas) about using citizen science data in your educational setting.

Course Dates

This is a self-directed course with suggested Unit deadlines. You will be completing this course in 30 days with a cohort of other educators. The estimated time commitment for this course is 30 – 38 hours.

Instructor Communication

Although this is a self-directed course, there are two instructors monitoring the course and available for questions. Instructors for this course are H. Jean Bryan, Project BudBurst Director and Jessa Finch, Project Assistant at Chicago Botanic Garden. To contact the instructors, please direct your messages to jbryan@chicagobotanic.org or jfinch@chicagobotanic.org.

Objectives

After completing this course, you will be able to:

- Understand the basic features of citizen science data, where to find data to work with and begin basic data analysis. (Unit 1)
- Explain how citizen science and citizen science data are utilized in educational settings to further student learning goals and outcomes and understand the importance of data protocols to this process. (Unit 2)
- Identify types of data from five national citizen science programs: CoCoRaHS, eBird, Project BudBurst, FrogWatch, and Picture Post. (Unit 3)
- Review and compare case studies for each of the five citizen science projects from Unit 3 and learn an educational data activity for each project. (Unit 4)
- Create a lesson plan using citizen science data that meets national educational standards for your learning environment. (Unit 5)

Course Materials

This course requires Internet connectivity and access to a Web browser (i.e. Internet Explorer, Firefox, Safari). Installed and up-to-date versions of the following software are also required:

- Adobe Reader is required and is available free of charge at http://get.adobe.com/reader/
- Microsoft Word (version 2007 or higher), or a word-processing program that can save as, or export as a docx file.
- Microsoft Excel or other spreadsheet-based program

Continuing Education Units (C.E.U's)

OPTIONAL Graduate level Continuing Education credit will be available through Colorado School of Mines. The cost for 2 credits is $95. Details for signing up for these credits will be made available during the first week of the course.

Requirements for Successful Completion

Successful completion of this course is measured by your completion of all assignments, which includes taking both the pre- and post-assessments. You will need to earn 80% or higher on the post-assessment. A more detailed rubric about how each assignment is evaluated is included in the course.

Course Outline

Unit 1: Navigating the Data Superhighway

Estimated time commitment: 5 – 6 hours

Unit 1 introduces you to data and specifically, citizen science data. We review basic introductory ideas about data in general (i.e., what are data, what are different types of data, what are various sources of data). You'll also explore where to find citizen science data and start conducting basic data analysis. These concepts are important to define before you start making meaning of the observations and measurements found in citizen science.

Learning Outcomes: Become familiar with what data are, types of data, and sources of data. Know where to find citizen science data. Be able to conduct basic data analysis. Participate in a data game to practice your new data analysis knowledge.

Unit 2: Power of the Learner – Citizen Science Data

Estimated time commitment: 5 – 6 hours

In Unit 2, you will dive deeper into the world of citizen science and discover what makes citizen science data unique. You will explore how citizen science is utilized in educational settings, what makes a good citizen science program for education and learn why data collection protocols are so important to meaningful learning with data. You will also learn from experts at the forefront of education in citizen science about the state of the field and contribute your voice to the conversation.

Learning Outcomes:

- Identify the concept of citizen science data
- Explain what makes citizen science data unique
- List three uses of citizen science in educational settings

- Explain the importance of data protocols to meaningful understanding of data
- Discuss the current state of education in citizen science and add your voice to the conversation

Unit 3: Data Exploration with Citizen Science

Estimated time commitment: 6 – 8 hours

In Unit 3, you will be introduced to five national citizen science projects: CoCoRaHS, eBird, Project BudBurst, FrogWatch, and Picture Post. You will learn about their unique data access and display capabilities. At the end of the Unit, you will reflect on what you've learned and start thinking about how you might apply it to your learning goals and objectives.

Learning Outcomes:

- Become familiar with five citizen science projects and their data access and display capabilities
- Begin thinking about how you might apply the data from these projects to your learning goals and objectives

Unit 4: Citizen Science Data and Education – Activities and Case Studies

Estimated time commitment: 7 – 9 hours

In Unit 4, you will further explore educational case studies around each of the citizen science projects you learned about in Unit 3. These projects were chosen because they are particularly useful in classroom and other educational settings. You will also be introduced to an education data activity for each of the projects that you could utilize with your students.

Learning Outcomes

- Read case studies about the educational use of each of the five citizen science projects
- Learn an educational activity for each of the five citizen science projects that you can use with your students

Unit 5: Lesson Plan Using Citizen Science Data

Estimated time commitment: 7 – 9 hours

In this concluding Unit you will reflect on all that you learned in Units 1-4 to create a meaningful and FUN lesson about citizen science data for your students that includes educational objectives, key topics and concepts that will be reviewed in support of the activity. You will also review NGSS and state educational standards that you can apply to your lesson.

Learning Outcomes

- Identify NGSS and/or state standards that you can reach with your lesson
- Create a lesson plan utilizing citizen science data that advances your instructional objectives
- Explore learning assessment strategies and determine an approach that fits your learning environment.