



Community Spotlight

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Biobytes: short activities that help groups engage with data science principles and practices

By Sam S Donovan



Module Description:

Biobytes are short activities that help groups engage with data science principles and practices. They are designed to catalyze a conversation about the intersection of undergraduate biology education and data science. This resource includes four activities that were piloted during the 2019 BioQUEST / QUBES Summer Workshop titled, [“Evolution of Data in the Classroom: From Data to Data Science”](#).

- [Biobyte 1 - Where are we in the data science landscape?](#) This short activity can be used to introduce the NAS Data Science For Undergraduates report's definition of data acumen and engage participants in a self assessment of how they connect with those 10 data science concepts.
- [Biobyte 2 - Exploratory data analysis](#) This short activity can be used to introduce the concept of exploratory data analysis and get participants to think about how this data science strategy is complementary to having students interpret graphs.
- [Biobyte 3 - Lab reports as reproducible research](#) This short activity introduces a discussion of reproducibility in scientific research and ways that we might address these ideas with undergraduates. There is an opportunity to use a prototype version of a Shiny app called [Serenity](#) to explore a Galapagos Finch morphological dataset from the [BIRDD](#) project.
- [Biobyte 4 - The role of data science principles and practices in undergraduate biology education](#) This short activity was an effort to launch a community conversation around the interface of data science principles and practices and undergraduate biology education. A variety of resources, communities, and projects are shared.

Teaching Setting:

These activities were designed to be used with undergraduate faculty to facilitate discussions about the intersection of data science and undergraduate

biology education. They take about 30 minutes and can be done in a large group context.

Citation:

Donovan, S. S. (2019). [Summer 2019 Biobytes](#). [Data Science in Undergraduate Biology Education \(DS-UBE\)](#), QUBES Educational Resources.
[doi:10.25334/EQDC-0T97](#)

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Related Materials and Opportunities:

There is a [discussion forum](#) where you are encouraged to share ideas for how to use these materials, make them better, and build new biobytes.

QUBES collaborates with a wide array of educational projects, professional societies, and other organizations. Over the last several years we have seen data science emerge as an important topic among our collaborators. We are working with a diverse community to initiate a discussion about how data science principles and practices intersect with undergraduate biology education. With the publication of the biobytes, a new group has been launched to promote effective communication across data science education projects. Visit [Data Science in Undergraduate Biology Education \(DS-UBE\) to learn more and join the conversation](#).

This resource consists of activities that were used at the 2019 BioQUEST / QUBES Summer Workshop titled, "[Evolution of Data in the Classroom: From Data to Data Science](#)". You can find other materials from the 2019 QUBES/BioQUEST workshop, including [posters](#), [session materials](#), and [presentation](#) abstracts, on the [workshop website](#). You are also encouraged to [subscribe to receive upcoming QUBES Newsletters](#) where we will be sharing highlights from the summer workshop.

The QUBES/BioQUEST team is already actively planning the 2020 QUBES/BioQUEST Summer Workshop, which will be held in Pittsburgh, PA. If you are interested in receiving information about this workshop as plans continue to develop, please [subscribe to receive updates](#).

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