Clare Gilroy   Methods of STEM
Data Integration Assignment   Summer 2019

Source: Evolution in Action: Graphing and Statistics via HHMI BioInteractive. Source:
https://www.hhmi.org/biointeractive/evolution-action-data-analysis (worksheets, video, and
teacher guides on the right hand corner)

As an educator, I like to think that *all* the topics I teach are of importance. However, I recognize
that evolution is critical for students to understand as it's a pillar of biology. Throughout our
evolution unit, we focus on definitions of vocabulary, hands-on and engaging labs, case studies,
and Darwin's research. Unfortunately, there is not a large focus on data, though data truly
enhances Darwin's findings. I utilized a similar activity with the Grant's data of beak sizes.
However, the worksheet I used simply had students analyze graphs and try to model what
would happen in the future to populations. Since this was our first time modeling, many
students struggled with this aspect of the lesson. Additionally, the lesson was not truly
engaging. I like this HHMI activity because the video really hooks students in. Students can
utilize technology by viewing the data on Excel, and still analyze the graphs. While I could still
have students model their predictions (and hopefully practice more before this), I liked the
questions from this activity better. I also liked that this had students create their own graphs at
the end because this is a skill we could always build upon.

Data is concrete evidence of phenomena. When scientists make observations about the natural
world around them, data supports their findings. Although I hesitated to use the word "prove"
with my students, sometimes I said that supporting data is the closest thing we have to "proving"
our ideas. In a biology class, where math isn't always the focus, sometimes our data collection
isn't at the forefront of our lessons. After reviewing the significance of math within science,
focusing on the collection and presentation of data to support findings is a goal of mine for next
year.

This activity allows for a plethora of connection to other content areas. For instance, I could
work with math teachers about statistics, graphing, and proper measurement. When first
looking at this lesson, I was thinking about omitting the standard deviation aspect of the activity
for my level of students. However, this would be great to coordinate with math teachers on. I
could also engage with English teachers about journaling, since that was a practice utilized by
Darwin. This would be a great way to appeal to students who are traditional arts students and
don't usually identify as science and math students. I could also work with social studies
teachers about geography and exploration since that was so relevant to Darwin's time period.
The geography and food availability on the island truly shaped evolution, so this would be a
great connection.

A possible lesson could include having students write in a journal as Darwin would. In their
journals, they can include data they find about finches, such as graphs displaying populations
over time, amount/type of food, water, and other resources that could affect populations. To tie
into other content areas, they could include notes about the geography and perhaps a poem

about the Galapagos. This would truly enrich their experience because even if students don't feel strongly about one area of the assignment, there are other ways for them to demonstrate their understandings.

Another possibility that would include more technology would be to coordinate with the technology and video teachers. HHMI provides a video that serves as a nice introduction of the Grants and their research. Students can create their own video about the data they find. I can only imagine the fun students would have dressing up and pretending to explore, yet still covering content such as data, geography, and evolution concepts. Either a journal or video would allow for student voice, creativity, yet still preserve the integrity of the lesson by having students include information about data and evolution.