ASM-CUE 2018: Developing Quantitative Skills in Your Courses Using HHMI BioInteractive and Partner Resources

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**BioInteractive and Partner Resources Jigsaw Scavenger Hunt**

**Data points**

From the BioInteractive Homepage: <https://www.hhmi.org/biointeractive>…

1. Click **Resource Type** and select **Data Point** (Data Points can also be found in the “Statistics and Math” Collection)
2. Scroll down and click on “Show all resources” at the bottom of the page

How many resources of this type are available?

List three you would be interested in exploring further:

1. Click on **Origins of Antibiotic Resistance**
2. Locate the original journal article citation at the bottom of the page. This can be referenced when developing your own questions on the Data Point.

What other types of BioInteractive resources are available for this topic?

1. Download and view the **Educator Materials** for this Data Point
2. Scan through these educator materials and be prepared to share out the following information with your teammates:
3. A brief overview of the experiment being represented by the graph and the results.
4. The quantitative skills highlighted by this Data Point.
5. Learning outcomes from your course that could be addressed using this Data Point.
6. (If time allows) Navigate back to the main **Data Points** page and select an additional Data Point of your choice. Be prepared to discuss with your teammates:
7. Why you chose this Data Point and in what way do you think you could implement it in your course.

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**Short Course**

From the BioInteractive Homepage: <https://www.hhmi.org/biointeractive>…

1. Click **Collections** and select **Statistics and Math**.
2. Scroll down and click on “Show all Statistics and Math Resources” at the bottom of the page
3. View the **Topics** in the left panel.

Which of these topics would be most applicable to courses you teach?

1. Scroll down to Resource Type on the left panel and click on **Short Course.** (Note, BioInteractive offers other Short Courses, but this one focuses on “Statistics and Math”)
2. Click on the **Spreadsheet Data Analysis Tutorials** short course.
3. View the five tutorial options.

Which of these tutorials might be applicable to your courses?

1. Click on **Spread Tutorial 1: Formulae, Functions, and Averages.**
2. Watch the short **HHMI Educator Tips** video.
3. Click on the “Access the Google Sheets Version Here” link and open the spreadsheet.
4. Explore the tabs at the bottom of the spreadsheet.

What do the different colored boxes denote?

Note these spreadsheets can be edited. Are there any data used in your courses students could apply these tutorials to?

1. Be prepared to share out the following information with your teammates:
   1. A brief overview the different tutorials and the quantitative skills they highlight.
   2. Learning outcomes from your course that could be addressed using this resource.
2. (If time allows) Navigate back to the main **Spreadsheet Tutorials** page and select an additional tutorial of your choice. Be prepared to discuss with your teammates:
   1. Why you chose this tutorial and in what way do you think you could implement it in your course.

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**Activities**

From the BioInteractive Homepage: <https://www.hhmi.org/biointeractive>…

1. Click **Collections** and select **Statistics and Math**.
2. Scroll down and click on “Show all Statistics and Math Resources” at the bottom of the page
3. View the **Topics** in the left panel.

Which of these topics would be most applicable to courses you teach?

1. Scroll down to Resource Type on the left panel and click on **Activity.** (Note, BioInteractive offers many other Activities, but these are Activities that focus on “Statistics and Math”)
2. Click on the activity **What van Leewenhoek Saw.**
3. Open the **Student Handout** and the **Organism and Cell Cards**.

Summarize the activities described in Parts 4 and 5.

How might these activities be expanded for a college course?

1. Be prepared to share out the following information with your teammates:
   1. A brief overview the activity and the quantitative skills it highlights.
   2. Learning outcomes from your course that could be addressed using this resource.
2. (If time allows) Navigate back to the main **Activities** page and select an additional resource of your choice. Be prepared to discuss with your teammates:

Why you chose this resource and in what way do you think you could implement it in your course.

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**Click and Learns**

From the BioInteractive Homepage: <https://www.hhmi.org/biointeractive>…

1. Click **Collections** and select **Statistics and Math**.
2. Scroll down and click on “Show all Statistics and Math Resources” at the bottom of the page
3. View the **Topics** in the left panel.

Which of these topics would be most applicable to courses you teach?

1. Scroll down to Resource Type on the left panel and click on **Click and Learn.** (Note, BioInteractive offers many other Click and Learns, but these focus on “Statistics and Math”)
2. Click on **Sampling and Normal Distribution**.
3. Click **Launch Click and Learn**.
4. Read the **Introduction** and then close out of the Introduction tab.
5. Adjust the Sample Size number and calculate the resulting graphs.

How does sample size affect the Standard Error graph? The Distribution of Means graph?

1. Click the **Key Concepts** tab.

Are any of these concepts applicable to your courses?

1. Be prepared to share out the following information with your teammates:
   1. A brief overview the resource and the quantitative skills it highlights.
   2. Learning outcomes from your course that could be addressed using this resource.
2. (If time allows) Navigate back to the main **Click and Learn** page and select an additional resource of your choice. Be prepared to discuss with your teammates:

Why you chose this resource and in what way do you think you could implement it in your course.

**BioInteractive and Partner Resources Jigsaw Scavenger Hunt**

**Virtual Labs**

From the BioInteractive Homepage: <https://www.hhmi.org/biointeractive>…

1. Click **Resource Type** and select **Virtual Labs**.
2. Scroll down and view the available Virtual Labs.

Which of these labs would be most applicable to courses you teach?

1. Click on the **Bacterial Identification Virtual Lab.**
2. Click **Start Virtual Lab.**
3. Read through the Intro and then click **Click to enter the lab.**
4. Complete the “**Sample prep**” portion of the lab.

Which important lab techniques are highlighted in this section?

1. Skip to “Sequence Analysis” by clicking “**Sequence Analysis**” below.
2. Follow the steps in the Notebook tab to BLAST your sequence and Identify the Bacteria.

How might this Virtual Lab be used in a lab course? In a course without a lab?

What might you add onto or highlight in this Virtual Lab to make it more applicable to your course?

1. Be prepared to share out the following information with your teammates:
2. prepared to share out the following information with your teammates:
   1. A brief overview the activity and the quantitative skills it highlights.
   2. Learning outcomes from your course that could be addressed using this resource.
3. (If time allows) Navigate back to the main **Virtual Labs** page and select an additional resource of your choice. Be prepared to discuss with your teammates:

Why you chose this resource and in what way do you think you could implement it in your course.

**BioInteractive and Partner Resources Jigsaw Scavenger Hunt**

**Science in the Classroom**

From the Science in the Classroom homepage: http://www.scienceintheclassroom.org/…

1. Scroll down and click on “**How to use this resource**”.
2. Note the “**Educator and Student Walkthrough**” videos. We won’t have time to view them today, but they are useful for familiarizing you and your students with the website.
3. Scroll down and read the “**Highlights**”.

Which of the highlighted components of the annotated papers do you think would be most useful in your classroom?

1. Scroll up and click on “**Topics**” in the blue bar.
2. Select topics of interest to you, click on them, and view the available annotated papers.

List one paper you would be interested in discussing in your courses.

1. Scroll up and click on “**Collections**” in the blue bar.
2. Under **CRISPR: Genetic Detective** click on **View Collection.**
3. This collection includes two annotated papers and a link to HHMI BioInteractive CRISPR-Cas9 Click and Learn.
4. Click on the first annotated paper: **“Can we handle the power of CRISPR?”.**
5. Scroll through the paper.

What types of supplemental resources are provided for this paper?

1. Scroll to and view figure 1.

What additional resources are provided to help students understand figure 1?

1. In the left “**Learning Lens**” panel, select “**Results and Conclusions**”.
2. Scroll through and find the highlighted text. Click a section of highlighted text.

What additional information is provided when the highlighted text is clicked on?

1. In the learning lens, select “**Connect to learning standards**”.

What additional information is provided when the highlighted text is clicked on?

What learning outcomes in your courses might an annotated paper be used to address?

1. (If time allows) Navigate back to the main CRISPR: Genetic Detective Page and explore **HHMI BioInteractive’s CRISPR-Cas9 Click and Learn**.

Be prepared to discuss how you could use this resource (SitC) in your course.

**Featured Resources**

1. Data point: Origins of Antibiotic Resistance
2. Short course: Spreadsheet and Data Analysis Tutorials
3. Activity: What Leeuwenhoek Saw
4. Click and learn: Sampling and Normal Distribution
5. Virtual Labs: Bacterial Identification Lab
6. Science in the classroom: CRISPR collection