How do small things make a big difference?

*Microbes, ecology, and the tree of life*

Teacher Workshop
July 28-30

Project NEURON and Project MICROBE
University of Illinois
Workshop Goals

• Experience Project NEURON/Project Microbe Curriculum Materials as a learner and teacher

• Interact with University of Illinois Scientists and Educators

• Develop a community of teachers

• Integrate Curriculum Materials with your local curriculum
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>9:00 - 9:20</td>
<td>Microbes in the news</td>
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<tr>
<td>9:20 – 10:30</td>
<td>Lesson 6: What can happen when my microbiome is disturbed?</td>
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<tr>
<td>10:30-11:30</td>
<td>Whole unit reflection &amp; report out</td>
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<td>11:30-12:00</td>
<td>Unit post-assessment</td>
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<td>12:00-12:30</td>
<td>Attitude survey and bagels</td>
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<td>12:30-12:45</td>
<td>CPDU forms and stipend paperwork</td>
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Lesson 6: What happens when my microbiome is disturbed?

Learning Objectives

1. Define and apply ecology concepts of disturbance, resilience, recovery, & diversity.

2. Interpret graphs demonstrating the effects of antibiotics on the resilience and recovery of the gut microbiome.

3. Compare and contrast two different antibiotics’ effectiveness at treating a *C. difficile* infection.

4. Evaluate and defend a treatment plan for a *C. difficile* infection.
https://www.youtube.com/watch?v=5DTrENdWvM
Lesson 6: What can happen when my microbiome is disturbed?

Activities

• Activity 1: What is a microbiome disturbance?
• Activity 2: Case study of recurrent *C. difficile* infections
• Activity 3: Comparison of treatment methods
Activity 1: What is a microbiome disturbance?

Image:  http://ngm.nationalgeographic.com/2013/01/125-microbes/oeggerli-photography
Activity 2: Case Study

Part A: Develop a hypothesis

Part B: Analyze data

STOP
(whole group discussion)

Part C: Construct an argument based on evidence

- Work in groups of 3-4
- Work through Parts A-B of the case study
- 20 minutes
Activity 2: Scientific Practice: Arguing from Evidence

Claim, Evidence, Reasoning

- An explicit process where students make a claim, support it with evidence and link the two through reasoning

McNeill and Krajcik (2012), Supporting grade 5-8 students in constructing explanations in science: The claim, evidence, and reasoning framework for talk and writing.
Activity 3: Treatment Comparison

How does antibiotic treatment compare to a fecal transplant treatment?

- Create a model representing the effects on the human microbiome.
How do small things make a big difference? Microbes, ecology, and the tree of life

Whole Unit Reflection and Discussion
40 minutes work time then discussion

1. What went well?
2. What did not go well?
3. How would you use this unit or modify it for your classroom?
Post – Assessment
30 minutes
Attitude Survey
30 minutes

https://www.surveymonkey.com/s/MICROBE2014

&

Bagels
CPDU forms & Stipend paperwork
Thanks!

For additional information visit:
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