

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



National Institutes
of Health

SEPA
SCIENCE EDUCATION
PARTNERSHIP AWARD

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

Day 3: July 30

Time	Session
9:00 -9:20	Microbes in the news
9:20 – 10:30	Lesson 6: What can happen when my microbiome is disturbed?
10:30-11:30	Whole unit reflection & report out
11:30-12:00	Unit post-assessment
12:00-12:30	Attitude survey and bagels
12:30-12:45	CPDU forms and stipend paperwork

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.

NPR human microbiome video

<https://www.youtube.com/watch?v=5DTrENdWvvM>

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.

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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/MICR>
OBE2014

&

Bagels

CPDU forms
&
Stipend paperwork

Thanks!

For additional information visit:
<http://neuron.illinois.edu>

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The screenshot shows the Project NEURON website homepage. At the top left is the University of Illinois logo. In the center is a stylized brain with the text "project NEURON" overlaid. To the right of the brain is a search bar and a "Log in/Create account" link. Below the header is a navigation menu with links for "Curriculum Units", "Professional Development", "Games and Media", "Additional Projects", and "About". The main content area features the title "Project NEURON" and the subtitle "Novel Education for Understanding Research on Neuroscience". A section titled "Find out more about our 2013 Summer Professional Development!" contains text about the project's goals and core activities. Below this is a "News and Events" section with three items: "Color Sorting Activity in The Science Teacher" (March 23, 2013), "Color Sorting Game is Back Online" (February 20, 2013), and "Project NEURON at 2013 Public Engagement Symposium" (February 6, 2013). On the right side of the news section is a "Neuroscience Day" poster for two events: one at Marina Inn in Sioux City, NE on March 19, and another at Siena Gilleska in Mission, SD on March 20. The poster includes a brain icon and the time "9:00 - 3:00 with lunch provided".