

Three Activities: Environmental Health - Bacteria Study, Micro Study, & Bacteria Killers

Goals

- to study and research emerging and re-emerging infectious diseases, particularly through vector-borne, food-borne, and water-borne educational activities
- to understand that certain exposures in the environment cause various infectious diseases

Activity	Objectives
Bacteria Study	<ul style="list-style-type: none"> • Give students hands-on experience with the concepts of epidemiology

The following activities are intended to give students hands on experience with the epidemiology concepts. It is encouraged that students not work alone, but as cooperative teams.

If students have not been introduced to using agar plates, cover that process first.

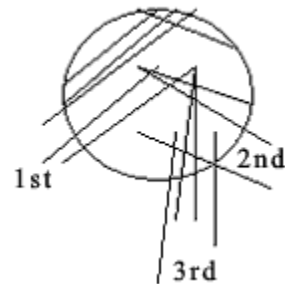
a) Ask students to think of three places in the classroom that they might find bacteria. Invite them to be creative in their choices. It is hoped that they will swap for bacteria on seats, pencils, doorknobs, cabinet handles. One creator of a similar activity invites students to “kiss” the agar.

b) Provide student groups with three cotton swabs (Q-Tips) and three agar plates and labels for their plates.

c) Instruct students to moisten the swab with distilled water, to collect bacteria, label the plate with name and location.

d) Invite students to streak their plates as a scribble pass; streak 1/3, turn and streak 1/3, turn and streak 1/3. Close the plate and set into a cabinet at room temperature.

The purpose of this streaking method is to hopefully show growth in area #3 as individual colonies. Areas #1 and #2 will likely be large clumps of colonies.



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e) Ask students to observe their cultures over a three to four day period. Students should note changes in dishes. Some locations of collection will have more or less cultures. Types of bacteria may be noted by color and shape.

Caution...The teacher may not wish students to open their agar plates, but to tape them closed. It is possible that molds will be present and that mold spores may cause allergic reactions in some students.

f) Ask students to include a “Summary” of their study. In this, students will compare locations, suggest implication for public health.

Disposal of agar plates may be by accomplished by boiling in a pressure cooker or by plates in a 50% solution of Chlorox. Or, the class may proceed with the next activities.

Micro Study

Goals

- to study and research emerging and re-emerging infectious diseases, particularly through vector-borne, food-borne, and water-borne educational activities
- to understand that certain exposures in the environment cause various infectious diseases

Activity	Objectives
Micro Study	<ul style="list-style-type: none"> • Sketch, observe, and compare different types of bacteria that can grow in moist conditions

As an extension of the above study, students may look at their cultures under the microscope. Caution students to not open agar plates near their face and to wash their hands when finished.

- a) Pick up a colony using a needle or wooden applicator.
- b) Stir the colony into a drop of water or a drop of bromthymol blue stain on a microscope slide. Cover with a cover slip or “heat fix” the bacteria by passing it over an alcohol or methane flame.
- c) Using a microscope, sketch, observe and compare different types of bacteria. Discuss where these were found.
- d) Wash the slides in a Clorox solution.

Bacteria Killers

Goals

- to study and research emerging and re-emerging infectious diseases, particularly through vector-borne, food-borne, and water-borne educational activities
- to understand that certain exposures in the environment cause various infectious diseases

Activity	Objectives
Bacteria Killers	<ul style="list-style-type: none"> • Determine what kills bacteria, especially household products

What things kill bacteria? Ask students to brainstorm household products that might kill bacteria. Student may bring thing from home, or the teacher may have some of these from home. The list may include: antibacterial soaps, rubbing alcohol (ethanol), Chlorox, various commercial antiseptic products. Students might experiments with various concentrations of these.

- a) Sketch the agar colonies and show the locations of drops of test solutions before application.
- b) Using eye droppers, place one drop of each test solution onto bacteria colonies.
- c) Observe after 1 minute, 5 minutes, 24 hours.
- d) Which solutions worked the best? Are advertising statements true?
- e) Disposal of agar plates may be by accomplished by boiling in a pressure cooker or by plates in a 50% solution of Chlorox.

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