Lesson Title	What's growing on you?
Length of Lesson	50 min class period
Created By	Kendra Wright
Subject	Science
Grade Level	7th grade
State Standards	7th grade Inquiry: 1b, Life Science: 3b
DOK Level	DOK 1, DOK 2
DOK Application	Recall, Skill/Concept
National Standards	5-8th grade: A (Inquiry), C (Life Science)
Graduate Research Element	The purpose of this lab is to introduce microorganism such as bacteria as living cells and to teach culturing techniques with two different nutrient agars. In my research, I culture and isolate microorganisms from soils.

Student Learning Goal

MS 7th grade

1b. Discriminate among observations, inferences, and predictions. (DOK 1)
3b. Classify the organization and development of living things to include prokaryotic (e.g., bacteria) and eukaryotic organisms (e.g., protozoa, certain fungi, multicellular animals and plants). (DOK 2)

National Science Education Standards 5-8th grade

Content Standard A: Use appropriate tools and techniques
Content Standard C: Structure and function in living systems

Materials Needed (supplies, hand-outs, resources):

NA, EMB agar, sterile disposable plastic Petri dishes, fine-tipped permanent markers, Q-tips, Microbial Growth.pptx, Microbial Growth Worksheet.docx; Proscopes

Lesson Performance Task/Assessment:

In this lesson, students will culture bacteria on two different agar plate media. The first medium is a very general nutrient agar (NA) which can grow most bacteria. The second medium is eosin methylene blue agar (EMB); it is selective for gram negative bacteria and has a blue color indicator for pathogenic bacteria. Students will compare the plate media by swabbing and culturing hand and mouth bacteria on both plates. Then, they will be able to swab areas of their choice within the lab.

Lesson Relevance to Performance Task and Students:

The purpose of this lesson is to communicate to students that: (1) microorganisms such as bacteria are living things which can grow on certain food sources (i.e. the two different

media) and (2) the importance of culturing techniques and why it is useful in labs and hospitals.

Anticipatory Set/Capture Interest:
The lab will begin with a PowerPoint explaining microbes and growth. The student's interest will be captured with disgusting pictures of skin infections. Then, I will ask the students to explain how a doctor might sample and identify the infectious organism.

Guided Practice:
All students will have one plate for each media which will be divided into four sections. On section 1 for both plates, students will place their fingers and gently glide them around to add hand bacteria. On section 2 for both plates, students will swab their mouths for bacteria and then swab section 2. I will also explain how microbial culturing is important to my research.

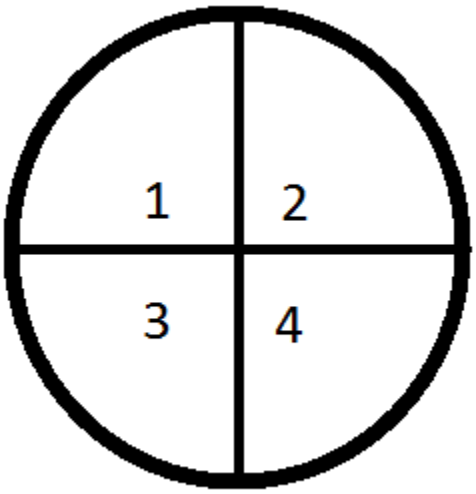

Figure 1. Picture of microbial plate divided into four sections.

Independent Practice:
Sections 3 and 4 on both plates are swabbing areas for objects of student's choice. On the second day of lab, students will see the microbial growth results for both plates. Students will also use light microscopes and Proscopes to investigate the cultures.

Remediation and/or Enrichment:
Remediation will follow IEP. For enrichment, students will investigate the cellular differences between prokaryotes and eukaryotes.

Check(s) for Understanding:
Class discussion will be used to check for understanding.
Questions:

1. What type of organisms can be cultured on the media plates?
2. What is a pathogenic organism?
3. Which media indicates the presences of pathogens?

Closure:
I will finish the lab by emphasizing the importance of culturing techniques and discussing the results of our culturing experiments.

Possible Alternate Subject Integrations:
Eukaryote versus prokaryote analysis could be integrated. Health subjects such as infectious agents could be covered.

Teacher Notes: Lesson is to be fun and interactive.