



SeaWorld/Busch Gardens Rescue and Rehabilitation

9-12 Classroom Activities

Bacteria Blast

OBJECTIVE

Using simple microbiology techniques, students will inoculate, culture, and identify common bacteria.

ACTION

1. As a class, discuss bacteria. What is it? Where is it found? How does it help humans? How can it be harmful?
2. Distribute agar plates, but don't open the lids. Discuss agar. (Agar, a seaweed-based medium, provides food for bacteria.)
3. Have students open lids and inoculate the plate by gently rolling an index finger over the agar. Students close lids and label each with their name, the date, and time of day.
4. Set agar plates in a warm spot in the classroom (not in direct sunlight). Or place in an incubator set at body temperature, 37C (98.6°F).
5. Students check plates after 24 and 48 hours. When growth appears, have students remove a small sample for staining. Follow directions given in the gram stain kit.
6. Compare growth patterns or shapes with those on page 23. Can students identify their cultures?

DEEPER DEPTHS

Obtain kits for blood typing, testing pH, thin layer chromatography, and electrophoresis.

BACKGROUND INFORMATION

Microscopic organisms such as single-cell bacteria thrive in many places. Some bacteria are beneficial. For example, *Escherichia coli* live in the large intestines of humans and help metabolize food materials missed by the upper digestive tract. Some other bacteria are harmful. Bacterial infections cause diphtheria, tuberculosis, typhoid fever, tetanus, and other diseases. Bacteria also lives in plaque, the film that forms on teeth.

Early microbiologists such as Louis Pasteur and Hans Christian Gram used simple methods for identifying different bacteria types. Bacteria appear in the general shapes of rods, spheres, or spirals. Shapes may be identified under a microscope, by growing cultures or by special coloring called gram stains. SeaWorld zoological staff conduct routine tests to assess animal health. Tests include culturing water samples and blowhole mucus to identify and, if necessary, treat bacterial or fungal infections.

If you or your class wishes to discuss the bacterium Anthrax, you can find information on the Centers for Disease Control Web site at <http://www.cdc.gov>

MATERIALS

Per student pair:

- nutrient agar plate (available through most biological supply catalogs)
- compound microscope

Per class:

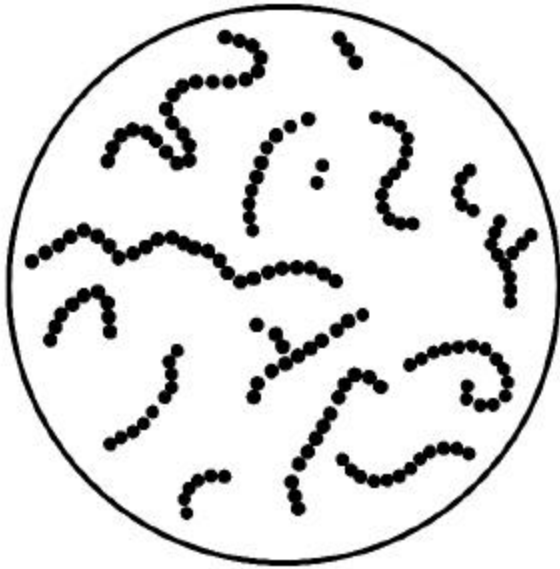
- bacteria gram stain kit
- incubator (optional)



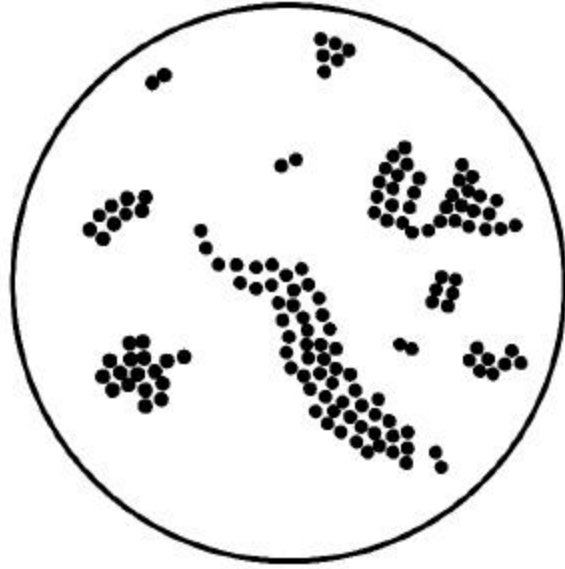
SeaWorld laboratory technicians often culture tissue or mucus samples to detect the presence of bacteria.

Bacteria Blast

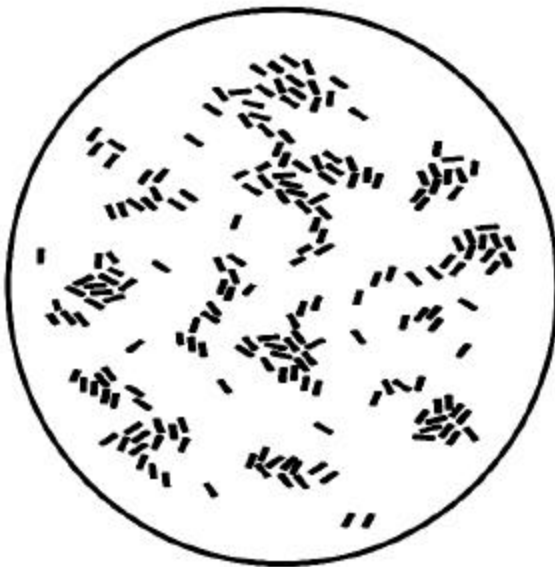
Use the bacteria growth patterns or shapes below to identify bacteria under a compound microscope. Draw a picture of your bacteria sample in Circle D.



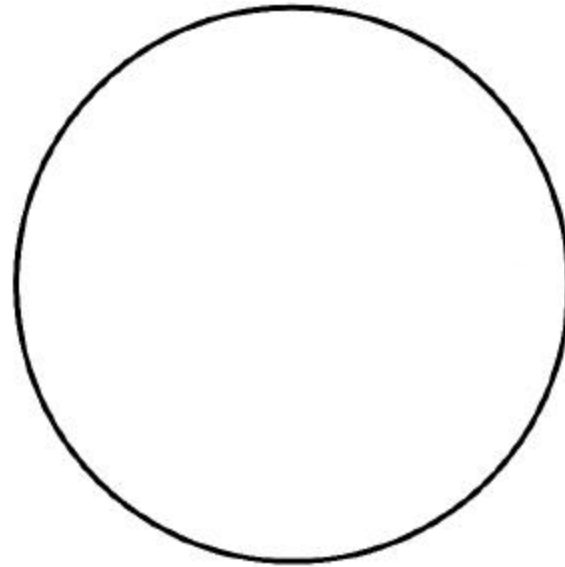
A. Gram stain appearance of gram-positive spheres, *Streptococci* (color purple)



B. Gram stain appearance of gram-positive spheres, *Staphylococci* (color purple)



C. Gram stain appearance of gram-negative rods, *Escherichia coli* (color pink)



D. _____
(color _____)