

Bacteria Blast



Objectives

To introduce students to simple microbiology techniques. Students will learn how to inoculate, culture, and identify common bacteria.

Materials

per student

- Bacteria Blast worksheet

per student pair

- nutrient agar plate
- compound microscope

per class

- bacteria gram stain kit

Background

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.

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. In a zoological park, scientists can examine aspects of marine animal biology that are difficult to study in the wild. This may aid in the conservation of wild populations.

Action

1. Discuss bacteria with students. What is it? Where is it found? How does it help or harm humans?
2. Distribute agar plates, but don't open lids. Discuss agar — a seaweed-based medium which provides food for bacteria.
3. Instruct students to open the lids and inoculate the plate by gently rolling an index finger over the agar. After closing the lids, students will label their plate 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, 37°C (98.6°F).
5. Students will check their plates after 24 and 48 hours. When growth appears, have students remove a small sample for staining. They will follow directions given in the gram stain kit.
6. Students will compare growth patterns or shapes with those on the worksheet. Can they identify their cultures?

Deeper Depths

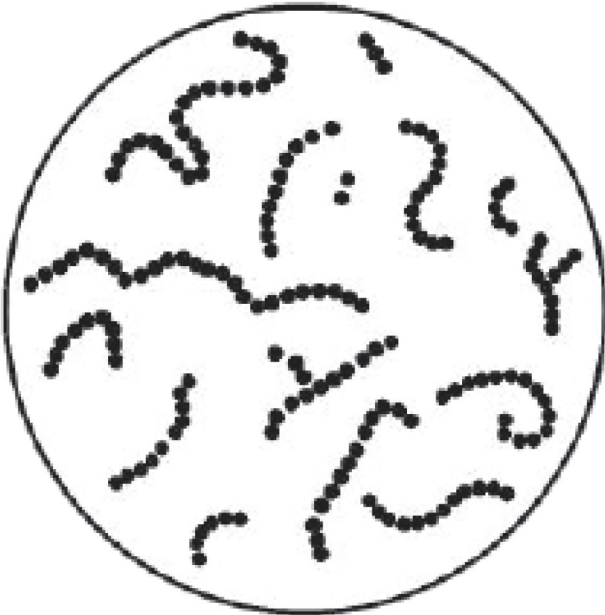
SeaWorld's Animal Rescue Team rescues ill or injured animals from local beaches or other habitats. Ask students to research how local water quality can affect the health of local animal populations.

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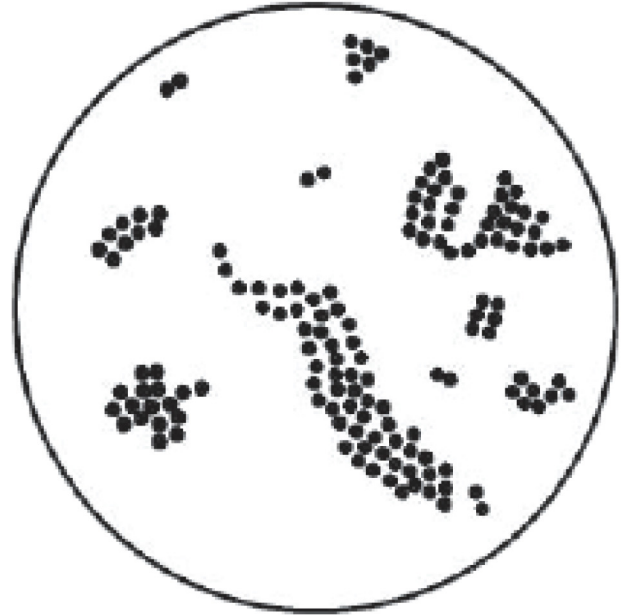


Name _____

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



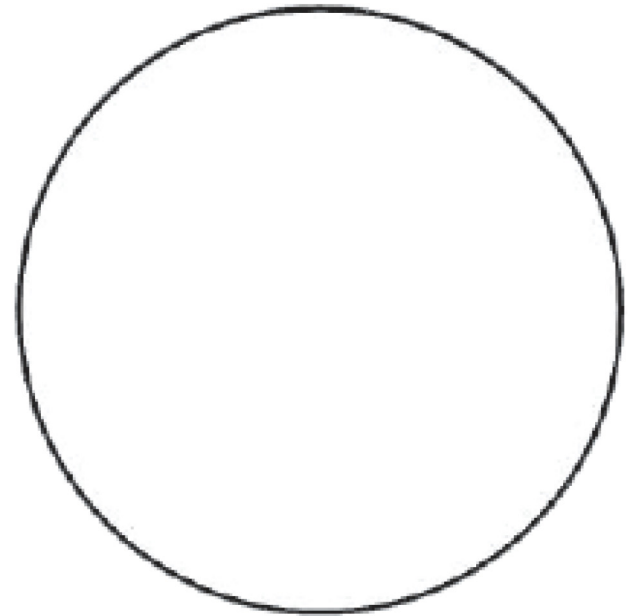
A. Gram stain appearance of gram-positive spheres, *Streptococci*. (color: purple)



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: _____