

“THE ART OF STREAKING” (FOR ISOLATION)

OBJECTIVE/RATIONALE

To identify microorganisms from a lab specimen it is necessary to isolate individual colonies. The student will learn how to streak an agar plate to isolate bacterial colonies.

TEKS: 121.14 1A,1B,4B,4C,4D

TAKS ELA 1, 4
Science 1, 2

National Science Education Standards A9-12;C9-12

National Health Care Skills Standards .01, .04, .05, .06, .07, .08

National Curriculum Standards for School Mathematics S1; S3

KEY POINTS

The Art of Streaking Powerpoint

- I. Key terms
 - a. Plating
 - b. Agar/Media
 - c. Streaking/Isolating
- II. Method
 - a. Spreads the colonies throughout four quadrants in such a way that the fourth quadrant will have the least amount of bacteria within it, therefore isolating colonies.
- IV. Streaking demonstration
 - a. Streaking handout
- V. Inoculation Procedure
 1. Open the lid of the agar plate enough to insert the swab and spread the inoculum over the surface of one quadrant of the agar plate.
 2. Flame and cool the inoculating loop.
 3. Streak the second quadrant of the plate by touching the loop into the first quadrant and streaking all the way across the second quadrant, making six to eight strokes.
 4. Flame and cool the loop.
 5. Streak the third quadrant by touching the loop into the second quadrant and streaking into the third quadrant, making six to eight strokes.
 6. Flame and cool the loop.
 7. Streak the fourth quadrant in a manner to produce isolated colonies. Touch the loop to the third quadrant and spread the organism into the fourth quadrant using a continuous streak in a “tornado” pattern. Decrease the width of the streaks horizontally and increase the distance between the streaks vertically.
 8. Flame and cool the loop.

ACTIVITIES

- I. Complete the **ART OF STREAKING LABORATORY INVESTIGATION.**

MATERIALS/RESOURCES

Nonpathogenic Escherichia coli broth cultures
MacConkey agar plates
Inoculating loops
Incubator @ 37C
Bunsen Burner
Gloves
Goggles
Lab coats
Surface disinfectant
Paper towels

Burton, Gwendolyn R.W. and Engelkirk, Paul G. (2000). *Microbiology for the Health Sciences, 6th ed.* New York: Lippincott, Williams, & Wilkins.

Daigger Discount Lab Supplies

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Infolab

ASSESSMENT

HOSA Event Sheet Rubric

ACCOMODATIONS

For reinforcement, the student will review the steps of the streaking technique and repeat the laboratory investigation.

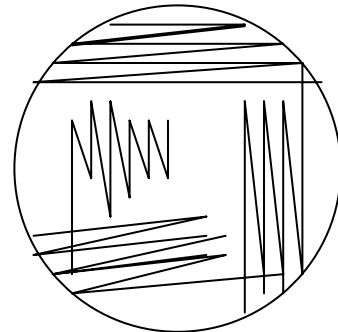
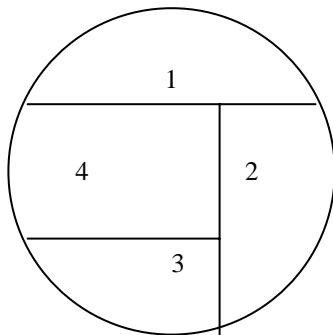
For enrichment, the student will swab their own skin with 4 sterile swab and inoculate a blood, chocolate, MacConkey and CNA plate and evaluate their streaking technique.

REFLECTIONS

STREAKING AN AGAR PLATE

PROCEDURE:

1. Hold the inoculating loop handle in one hand as you would a pencil. Hold the agar plate in the opposite hand.
2. Open the lid of the agar plate enough to insert the swab and spread the inoculum over the surface of one quadrant of the agar plate. Do not streak over previously streaked lines.
3. Flame and cool the inoculating loop.
4. Turn the plate so section two is in position. Streak the second quadrant of the plate by touching the loop into the first quadrant and streaking all the way across the second quadrant, making six to eight strokes.
5. Flame and cool the loop.
6. Streak the third quadrant by touching the loop into the second quadrant and streaking into the third quadrant, making six to eight strokes.
7. Flame and cool the loop.
8. Streak the fourth quadrant in a manner to produce isolated colonies. Touch the loop to the third quadrant and spread the organism into the fourth quadrant using a continuous streak in a “tornado” pattern. Decrease the width of the streaks horizontally and increase the distance between the streaks vertically.
9. Flame and cool the loop.



THE ART OF STREAKING

PURPOSE:

The student will learn how to streak an agar plate to isolate bacterial colonies.

BACKGROUND INFORMATION

MATERIALS

Nonpathogenic Escherichia coli broth cultures

MacConkey agar plates

Inoculating loops

Incubator @ 37C

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Gloves

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Lab coats

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Paper towels

PROCEDURE

Read all instructions before beginning the procedure.

1. Wash hands and put on gloves and goggles.
2. Obtain all material and return to station.
3. Prepare work area
4. Label agar plates with name of student, bacteria, and date.
5. Begin streaking the plates as follows:
SEE HANDOUT
6. To avoid contamination, use a different loop when streaking each plate.
7. Place in 37C incubator upside down for 24 hours.
8. Clean reusable equipment and returned to proper storage; put disposables in biohazard container.
9. Clean work area with surface disinfectant.
10. Remove gloves and wash hands with disinfectant.
11. Record results:
Record a yes or no in the appropriate boxes.

Data:

ISOLATED COLONIES RESULTS

PLATE	QUAD ONE	QUAD TWO	QUAD THREE	QUAD FOUR
1				
2				
3				

(Quad = quadrant of the agar plate)

CONCLUSIONS

1. Did you successfully isolate Escherichia coli colonies?
2. Explain in complete sentences the results of the chart above.
3. Why is it important to isolate colonies?
4. How can you determine if a colony on a plate is a contaminant or from the patient specimen.
5. Why does this streaking technique help to isolate colonies of bacteria?
6. How does isolation contribute to isolating bacteria in treating diseases?