Bacteria & Hand-washing Lab

Introduction

How many times has someone told you: “Go wash your hands before dinner?” Why is hand washing important? Find out in this activity and discover which hand-washing method is the hands-down winner? Microorganisms are found on every inch of your body. Some microorganism are beneficial to you and some are harmful. The most common microorganism is bacteria. Microorganisms can be transmitted from person to person in many ways.

Materials

- Plastic Petri Dish with nutrient agar
- Q-Tips
- Masking Tape
- Permanent Marker
- Access to sink with water
- Regular Soap
- Antibacterial Soap
- Hand Sanitizer
- Paper Towels

Procedure – Day 0

1. Formulate the hypothesis about which hand-washing method will work the best
2. Label the petri dish with your class period and group number
3. Pick a group member to be the tester
4. Tester should wash their hands then report to dirt station
5. Tester handles dirt for 1 minute
6. After 1 minute, tester returns to their group to carry out hand-washing method for 1 minute
7. After the method is complete, another group member needs a wet Q-Tip and swab the hand tester
8. Swab the Q-Tip on your petri dish in a “S” pattern while avoiding pressing the swab down. Rotate the dish 45 degrees and draw a second “S”
9. Place a lid on the dish, write group number on it with tape
10. Return dish to teacher

Days 1-3

1. Observe the petri dishes for bacteria colonies.
2. Count and record the number of colonies on each dish.

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 – No hand-washing</td>
<td></td>
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<tr>
<td>Group 2 – Water only</td>
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<td>Group 3 – Regular soap</td>
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<tr>
<td>Group 4 – Antibacterial soap</td>
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<td></td>
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<tr>
<td>Group 5 – Hand sanitizer</td>
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</tbody>
</table>
Analysis Question

1. After comparing the dishes of each group, which one has the most growth?

2. Rank the hand-washing techniques from worst to best.

3. Based on your results, which hand-washing technique would you recommend to friends and family as the best? Why?

4. What evidence do you have that microorganisms can be transmitted by hands?

5. What are some diseases that might be transmitted by hand contact?

6. Why is it important for food service employees to wash hands?

7. Graph your results.
   Title: ___________________________ vs. ___________________________
   Independent variable vs. Dependent variable
Bacteria & Hand-washing Pre-Lab

Variables:

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>I will change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable</td>
<td>I will measure</td>
</tr>
<tr>
<td>Constants</td>
<td>I will keep these the same</td>
</tr>
<tr>
<td>Control</td>
<td>I will not change</td>
</tr>
</tbody>
</table>

Predict an Outcome:

When I change ______________________________, I predict that ______________________________ will happen to _______________________________ because ________________________________.

Write a Hypothesis:

If ______________________________ is changed, then ______________________________ will happen to ______________________________ because ________________________________.

Predicted outcome

Predicted outcome