

## ANALYSIS OF CURRENT INFECTION CONTROL MEASURES

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### OBJECTIVES/RATIONALE

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Following standard precautions and other infection control measures aids in preventing the spread of infection. The student will recognize commonly used chemical disinfectants and understand their effects on microbes.

TEKS 121.14 (c) 5E, 1A, 2B, 2C

TAKS ELA 1, 4  
Mathematics 4, 8, 10  
Science 1, 3, 4

National Science Standards A9-12; C9-12; E9-12; F9-12

National Health Care Skills Standards .01, .02, .03, .05, .06, .07

National Curriculum Standards for School Mathematics S1; S2; S3; S10

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### KEY POINTS

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- I. Key terms relating to the control of microorganisms
  - a. Bacteriostatic
  - b. Bacteriocidal
  - c. Antiseptic
  - d. Asepsis
  - e. Disinfectants
  - f. Sanitation
  - g. Sterilization
- II. Moist heat, dry heat, steam, and gas are the most common physical agents used for microbial destruction.
  - a. Autoclave
  - b. Chemclave
  - c. Mechanisms of action
  - d. Recommended usage
- III. Chemical agents used depend on the type of material to be disinfected and the types of organisms present.
  - a. Chemical agents used
    1. Organic solvents
    2. Heavy metal compounds
    3. Oxidizing agents
    4. Alkylating agents
    5. Surface-active agents
    6. Phenolics
  - b. Mechanisms of action
  - c. Recommended usage and concentration
- IV. The effectiveness of chemical agents used inhibit microbial growth is dependent on:
  - a. Inactivation by organic materials
  - b. Bacterial cell resistance
- V. The use of chemical agents poses health risks for those exposed to toxic levels and can result in environmental contamination.

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## ACTIVITIES

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- I. Complete the **Disinfectants Worksheet**.
- II. Complete the **Evaluation of Disinfectants Laboratory Investigation**.

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## MATERIALS/RESOURCES

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*Microbiology - Principles and Health Science Applications*, Lois M. Bergquist, PhD. and Barbara Pogolian; W.B. Saunders Co., 2000; unit 6, chapter 21.

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## ASSESSMENT

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Completion the **Disinfectants Worksheet**.

### **Laboratory Investigation Rubric**

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## ACCOMMODATIONS

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For reinforcement, the student will conduct an inventory of disinfecting agents used at home. Students should note the purpose each is used, its intended purpose, and the hazards of using the various disinfecting agents.

For enrichment, the student will write a report analyzing a case in which the improper use of a chemical or physical agent resulted in disease transmission

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## REFLECTIONS

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## Disinfectants Worksheet

1. Explain how you would disinfect each of the following items:

a. latex ice bag

b. Bandage scissors

c. Scalpel

d. Linen

e. Bathroom sink and toilet

## Evaluation of Disinfectants

### Purpose:

In this laboratory investigation, the student will recognize commonly used chemical disinfectants and understand their effects on microbes.

### Background Information:

### Materials:

4 Sterile swabs

4 Agar plates

Incubator 37C

Three disinfectant solutions of choice (alcohol, Lysol, Scope, bleach, etc.)

Paper towels

Gloves

Goggles

Lab coat

### Procedure:

1. Wash hands and put on gloves and goggles.
2. Assemble equipment and materials.
3. Swab one corner of desk with sterile swab. This is the control corner.
4. Remove cover from agar plate.
5. Gently, rub the swab across the surface of the agar. Label the plate control.
6. Place the cover on the agar plate.
7. Choose a solution to wipe down different corner. Allow to dry.
8. Using a new sterile swab, swab this corner of desk.
9. Repeat steps 2, 3, and 4.
10. Repeat steps 5, 6, and 7.
11. Place plates in a 37C incubator for 24 hours.
12. Clean work area with surface disinfectant. Remove goggles and gloves and wash hands.

### Data:

Observe the cultured plates after 24 hours. Count the colonies grown on each plate. Using the data, design a bar graph to depict the effect of disinfectants on microbial growth.

**Conclusion:**

1. Research and list in order of effectiveness, the products responsible for the antimicrobial action.
2. Research the chemical ingredients in each product responsible for the antimicrobial action.
3. Place solutions chosen in the appropriate category of action. (Bacteriostatic, Bacteriocidal, Antiseptic, Asepsis, Sanitizer, Sterilization, Disinfectant)
4. Identify any hazardous warnings for each disinfectant.
5. Locate the material safety data (msd) sheets for each disinfectant and identify the precautions.
6. Why is one product more effective than another?
7. Based on your experience, explain how advertising influences consumer choices of disinfectant products. How can you verify the advertising information is reliable?