SI Microbiology - Full Discipline Demo

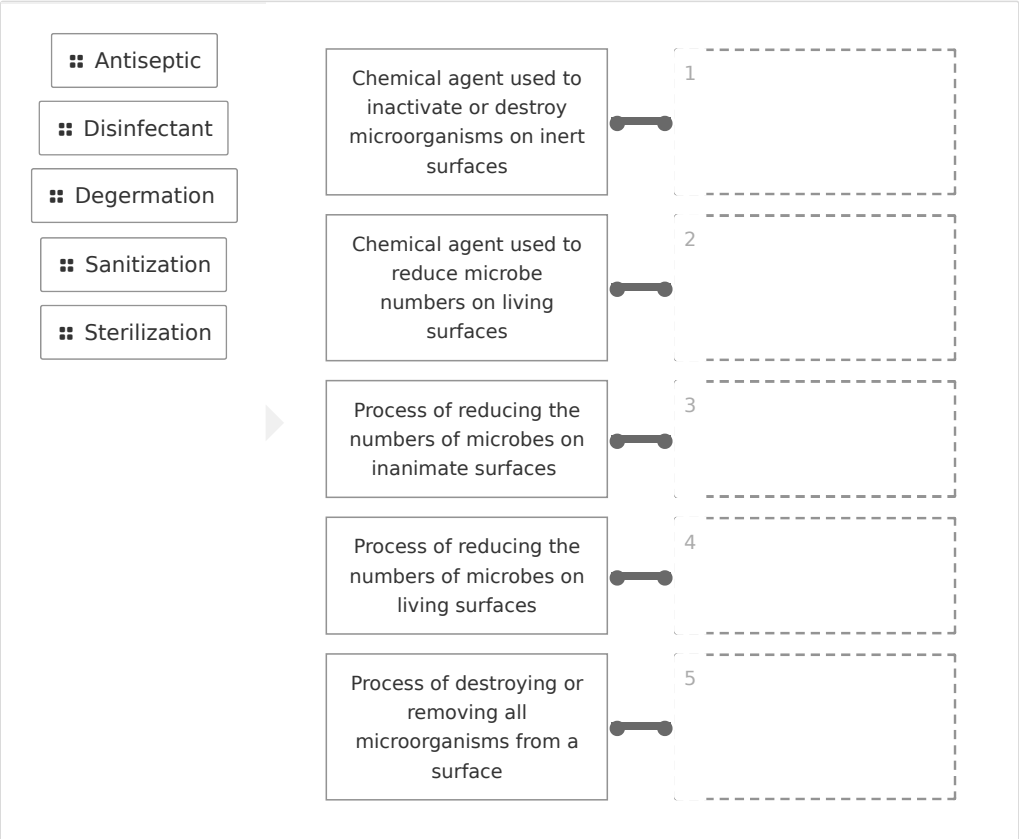
Minimum Inhibitory Concentration Testing

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI Microbiology - Full Discipline Demo
Course	SI Microbiology - Full Discipline Demo
Instructor	Sales SI Demo

Test Your Knowledge

Match each term to the best description.

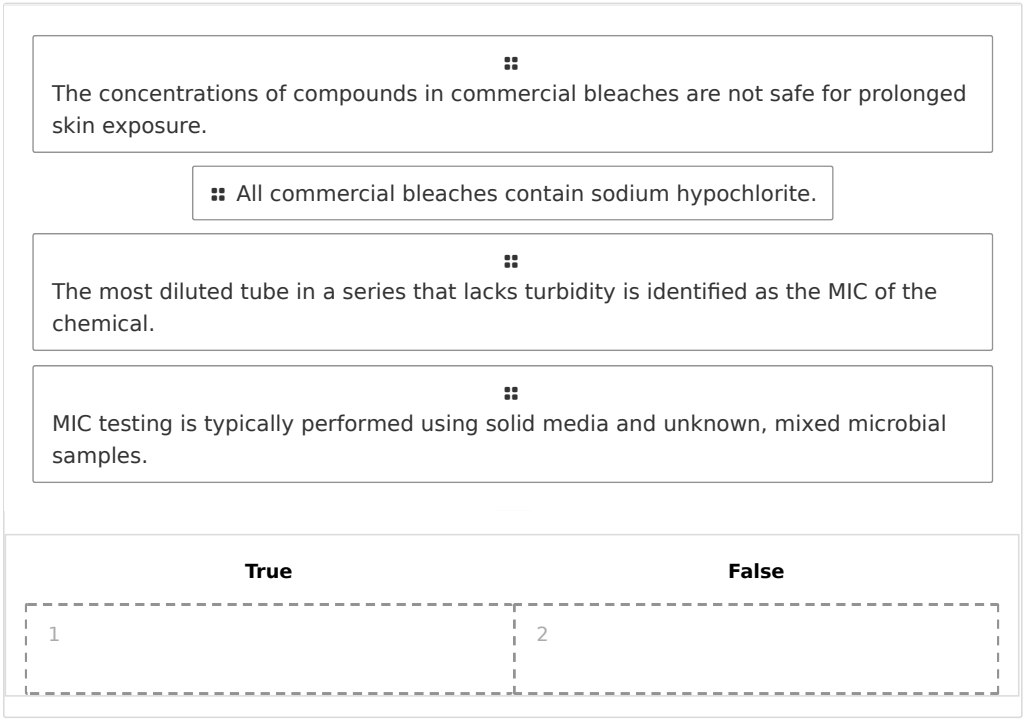


Correct answers:

1 Disinfectant 2 Antiseptic 3 Sanitization 4 Degermation

5 Sterilization

Categorize each statement as true or false.



Correct answers:

1

The concentrations of compounds in commercial bleaches are not safe for prolonged skin exposure.

The most diluted tube in a series that lacks turbidity is identified as the MIC of the chemical.

2 All commercial bleaches contain sodium hypochlorite.

MIC testing is typically performed using solid media and unknown, mixed microbial samples.

Exploration

Disinfectants are potentially hazardous chemicals that can damage living tissue at the higher concentrations present in commercial solutions.

- [x] True
- [ ] False

_____ is an active ingredient commonly found in mouthwash.

- Cetylpyridinium chloride
- Chlorhexidine digluconate
- Ethanol
- All of the above ✔

Microbial growth is indicated by _____ when performing minimum inhibitory concentration testing with liquid media.

- flocculence
- color
- odor
- turbidity ✔

Exercise 1

What were the antimicrobial agents in the mouthwash and bleach that you provided for this exercise? Were the agents antiseptics or disinfectants? Explain your answer based on how each product is used.

Student answers may vary based on the brand of mouthwash and bleach they provide. Internal testing was performed with a mouthwash that contained ethanol and cetylpyridinium chloride and bleach that contained sodium hypochlorite. The agents in the mouthwash function as antiseptics because they are used to reduce microbe numbers on living surfaces. The agent in the bleach is a disinfectant because it is used to reduce microbe numbers on non-living surfaces.

Was the mouthwash or bleach most effective at prohibiting the growth of *Saccharomyces cerevisiae*? Reference your results recorded in Photo 2 in your explanation.

Student answers will vary by the brands of bleach and mouthwash used but should be supported by their results recorded in Photo 2. Internal testing produced similar results for each solution with tube 3 representing the MIC for mouthwash and bleach.

Photo 1: Inoculated Dilution Series
(SAMPLE ANSWER BELOW)

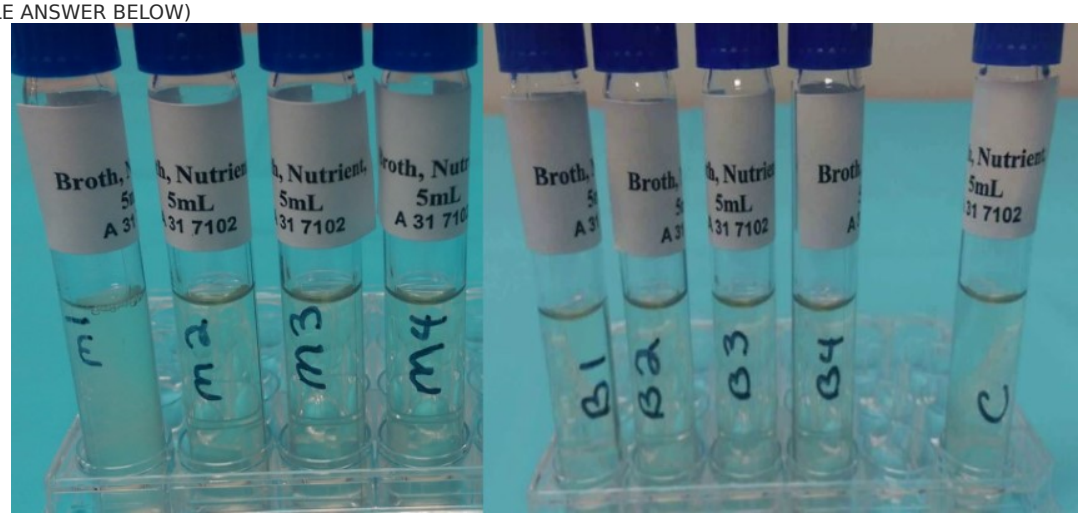
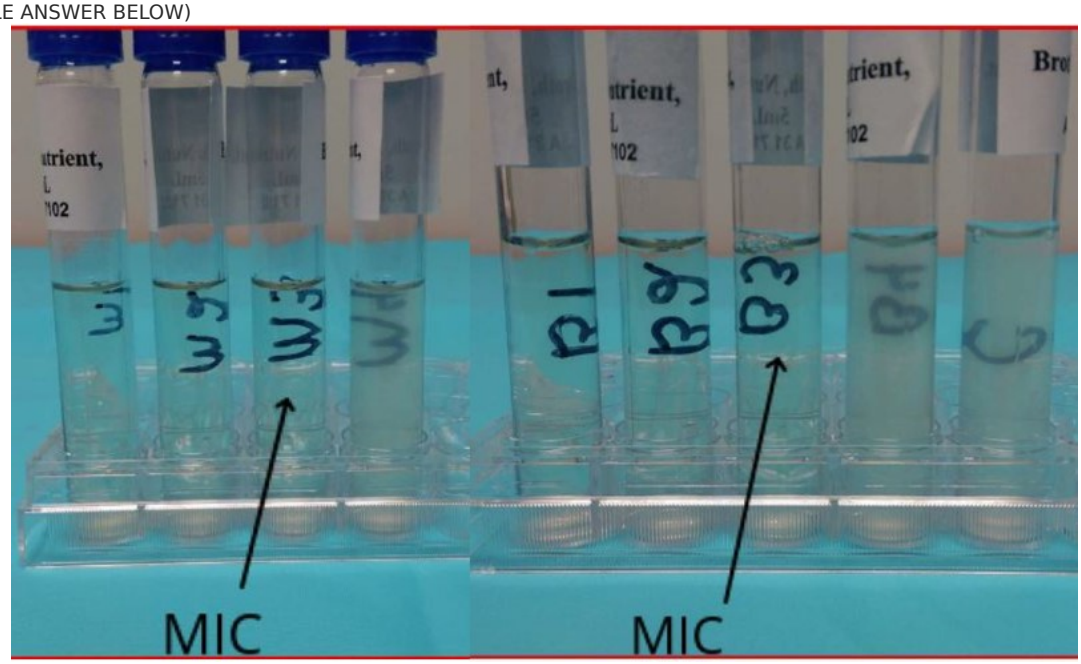


Photo 2: Incubated Dilution Series
(SAMPLE ANSWER BELOW)



Competency Review

A(n) _____ is most commonly used for the sanitization of a surface.

- antiseptic
- disinfectant ✔
- sterilant
- antibiotic

_____ is an example of an antiseptic applied to human skin.

- Isopropyl alcohol
- Iodine
- Dilute hydrogen peroxide
- All of the above ✔

_____ is the active ingredient in chlorine bleach.

- Hydrogen peroxide
- Sodium hypochlorite. ✔
- Chlorhexidine digluconate
- Ethanol

Hydrogen peroxide is an active ingredient in both some bleaches and some mouthwashes.

- True ✔
- False

MIC testing requires a series of dilutions be created between the antimicrobial compound and liquid media.

- True ✔
- False

Aseptic technique is followed when creating MIC dilutions by _____.

- using a sterile pipet
- flaming opened tubes
- holding lids facing down
- All of the above ✔

Permanent marker labels on the lower half of MIC broth tubes can be used to both identify dilutions and evaluate turbidity.

- True ✔
- False

Dilutions of commercial _____ are effective at controlling the growth of *Saccharomyces cerevisiae*.

- bleach
- mouthwash
- bleach and mouthwash ✔
- None of the above

Extension Questions

A microbiology student's MIC results for their provided bleach solution produced clear dilution tubes and a turbid control tube. What do their results suggest about the MIC of their bleach solution? How should the student alter the procedures to identify the MIC for their solution? (SAMPLE ANSWER BELOW)

The results suggest the most dilute bleach solution in the test was strong enough to inhibit microbial growth, meaning the student failed to identify a MIC in their test. The student should repeat the procedures using half the volume of solution transferred to each of the dilution tubes to reduce the overall concentration of bleach in the tubes to better identify the MIC for their commercial solution.