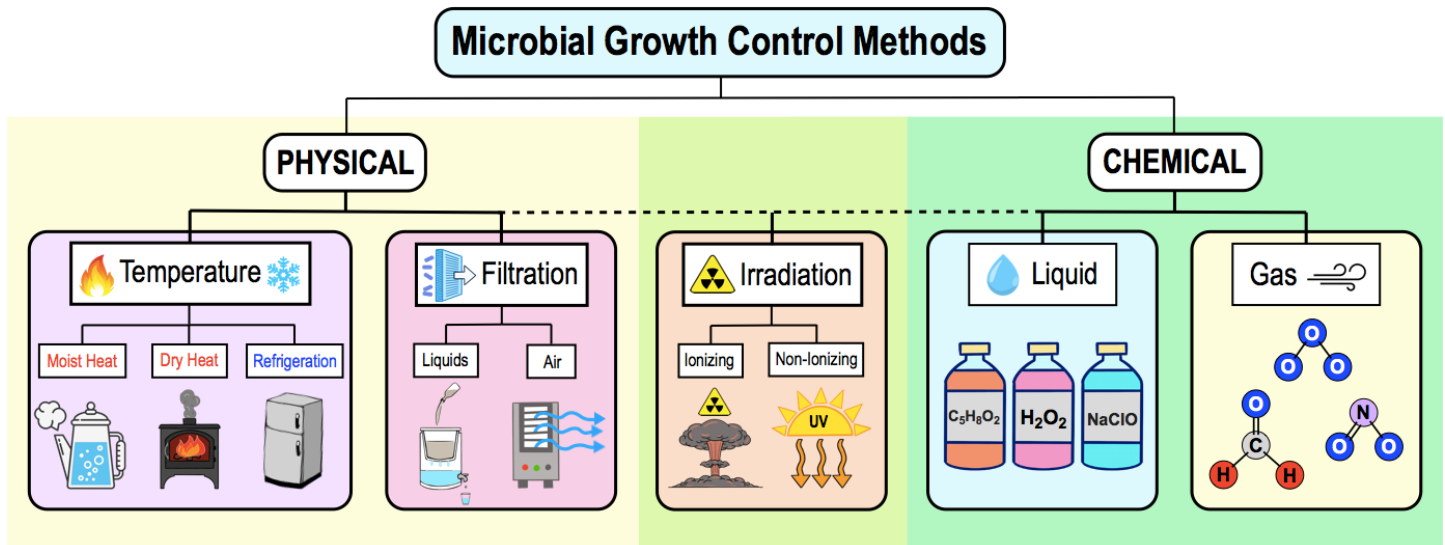


## **CONCEPT: INTRODUCTION TO CONTROLLING MICROBIAL GROWTH**

- Controlling microbial growth is critical to human health & a wide variety of processes (ex. manufacturing products/foods).
  - Uncontrolled microbial \_\_\_\_\_ can lead to increased risk of disease & spoilage/reduced quality of products.
  - Processes used to control/limit microbes are either \_\_\_\_\_, \_\_\_\_\_ or both.
  - Selecting a process depends on many variables including the circumstances & level of control required.

**EXAMPLE:** Map of the Lesson on Processes Controlling Microbial Growth.



**PRACTICE:** Why is it important to human health and wellbeing that we control microbial growth?

- Uncontrolled microbial growth can lead to increased risks of disease and infection.
- Uncontrolled microbial growth can lead to spoilage of food products.
- Uncontrolled microbial growth can lead to contaminated experiments.
- All of the above.

**PRACTICE:** Physical methods used to control microbial growth include all of the following *except*?

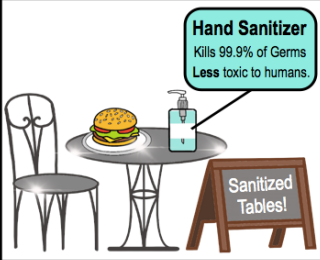
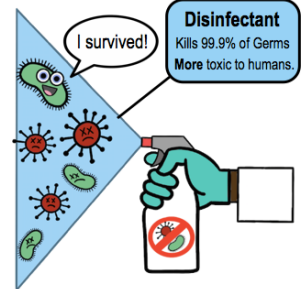
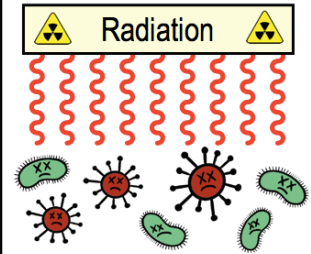

- Refrigeration.
- Air filtration.
- Liquid chemical disinfectants.
- Steam (moist heat).

## CONCEPT: INTRODUCTION TO CONTROLLING MICROBIAL GROWTH

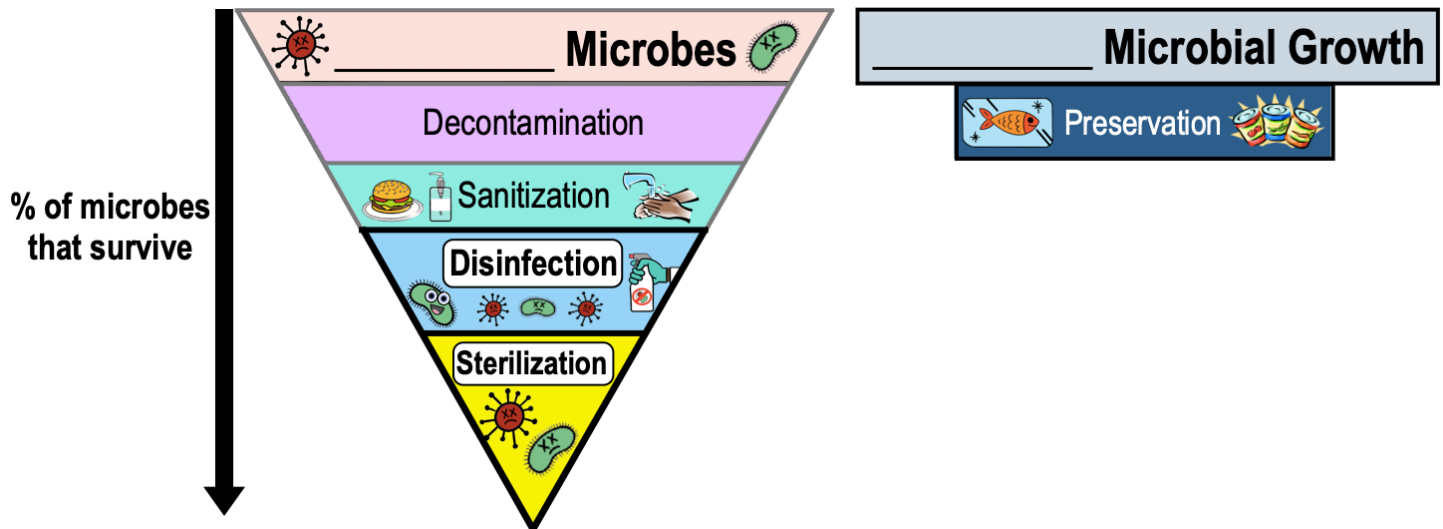
### Terminology of Microbial Growth Control

• Several terms are used in relation to controlling microbial growth:

- **Decontamination:** *general term referring to the \_\_\_\_\_ of the number of pathogens to a safe level.*
- **Sanitization:** *cleaning & reducing pathogens to meet accepted public health standards, minimizing disease.*
- **Disinfection:** *elimination of \_\_\_\_\_ pathogens (disease-causing agents); some viable microbes may remain.*
- **Sterilization:** *elimination of \_\_\_\_\_ microbes (except prions) such as microorganisms, viruses & endospores.*
- **Preservation:** *process of \_\_\_\_\_ spoilage of perishable products (items likely to go bad quickly).*

Decontamination Reducing the number of pathogen to a safe level.			
Sanitization	Disinfection	Sterilization	Preservation
Reducing pathogens to meet public health standards. Minimizes the spread of _____.	Elimination of _____ pathogens.	Elimination of _____ microbes (except prions).	_____ spoilage of perishable products.
			

### Hierarchy of Microbial Growth Control Terminology



## CONCEPT: INTRODUCTION TO CONTROLLING MICROBIAL GROWTH










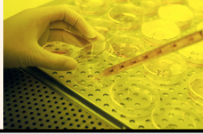

**PRACTICE:** What is the main difference between preservation and sterilization?

- a) Preservation does *not kill* microbes but delays microbial growth. Sterilization kills *all* microbes, except prions.
- b) Preservation preserves food by killing *all* microbes present in/on food. Sterilization kills *most* pathogenic microbes.
- c) Preservation reduces pathogens to meet health standards. Sterilization kills *all* microbes.
- d) Preservation kills *all* microbes except prions. Sterilization kills *all* microbes, including prions.

## Situations Warranting Different Levels of Microbial Growth Control

- Methods used for microbial growth control \_\_\_\_\_ greatly depending on the situation & level of control.
  - Control measures used on a regular basis at your home may not be adequate for a surgery room in a hospital.

**EXAMPLE:** Different Scenarios Require Different Levels of Microbial Growth Control.

<div>① <b>Life</b></div> <div>_____ with soaps/detergents &amp; cooking &amp; refrigerating foods.</div> <div></div> <div></div>	<div>② <b>Hospitals</b></div> <div>_____ surgical equipment &amp; operating rooms to avoid Healthcare-Associated Infections (_____).</div> <div></div> <div>Creating sterile field for surgery.      Steam sterilizes surgical tools.</div>
<div>③ <b>Food Production</b></div> <div>Using physical &amp; chemical methods for food _____.</div> <div></div> <div>Pasteurization kills microbes in milk.      Irradiated fruits &amp; veggies.</div>	
<div>④ <b>Treatment</b></div> <div>_____ drinking water preventing waterborne illnesses.</div> <div></div> <div>Deer Island Water Treatment Plant.</div>	<div>⑤ <b>Laboratories</b></div> <div>_____ equipment &amp; using aseptic techniques prevents contamination.</div> <div></div> <div>PPE protects scientist in a Covid-19 lab.      UV light prevents contamination.</div>

**PRACTICE:** Which of the following concerning the varying levels of microbial control is *false*?

- a) We clean and sanitize our homes to *reduce* the number of microbial pathogens.
- b) Hospitals attempt to *sterilize* and *kill all* microbes in rooms and on tools to prevent infection.
- c) Pasteurization and irradiation are common microbial growth control methods used in food production.
- d) Laboratories *sterilize* media and tools to prevent contamination of their experiments.
- e) All of the above are true.