

SI Microbiology - Full Discipline Demo

Microbiology Laboratory Prep

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

Identify each statement as true or false.

⚡ Exposure to bright light can inhibit microbial growth.	
⚡ Goggles, gloves, a face mask, and an apron should be worn whenever working with active cultures.	
⚡ Low incubation temperatures decrease the amount of time required for microbial growth.	
⚡ Microbiology lessons often require incubation periods and agar plate pouring.	
⚡ Most microbiology lessons can be completed in 1 or 2 hours.	
True	False
1	2

Correct answers:

1

Goggles, gloves, a face mask, and an apron should be worn whenever working with active cultures.

Exposure to bright light can inhibit microbial growth.

Microbiology lessons often require incubation periods and agar plate pouring.

2 Most microbiology lessons can be completed in 1 or 2 hours.

Low incubation temperatures decrease the amount of time required for microbial growth.

Match each term to the best description.

Active culture	Liquid media used to grow microbes in the laboratory	1
Incubation	Process of growing microbes in a controlled environment	2
Broth	Process of melting and adding agar to Petri dishes	3
Plate pouring	Population of living microbes that is used in laboratory procedures	4

Correct answers:

1 Broth 2 Incubation 3 Plate pouring 4 Active culture

Exploration

_____ is a solid gel used to grow microbes in the laboratory.

- ☒ Agar
- ☐ Broth
- ☐ Petri dish
- ☐ Active culture



Many microbiology lab titles require _____.

- ☐ plate pouring
- ☐ curriculum engagement
- ☐ culture incubation
- ☒ All of the above



Laboratory-style incubators are required for culturing the microbes used in Science Interactive experiments.

☐ True

☒ False



Cultures should be soaked in bleach for ____ before disposal.

☐ 20 minutes

☐ 1 hour

☒ 2 hours

☐ 1 minute



Exercise 1

Approximately how many total hours should you allocate to complete a lesson that requires an active culture, pouring plates, and incubating microbes?

Approximately 5 days should be allocated from start to completion: 2 days to develop an active culture; 1 hour to pour plates; 3 hours to review content, perform procedures, and answer questions; and 2 days for microbes to incubate.

Will you need to conduct more than one experiment at a time to meet the assignment due dates? Explain your answer by referencing the completed calendar uploaded into Photo 1.

Student answers will vary, but many students may need to conduct more than one experiment at a time in order to meet deadlines. Students should reference the calendar that was completed during the exercise in their answers.

Data Table 1: Time Allocations for Microbiology Lessons
(SAMPLE ANSWER BELOW)

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Title	Due Date	Curriculum engagement (hrs)	Plate Pouring (hrs)	Culture Incubation (hrs)	Total Time Allocation (hrs)
Instructor Note: lesson list and due dates should match course syllabus. Ubiquity of Microorganisms	Students answers should match instructor syllabus	3	1	48	52
Hand Washing and Normal Flora		3	1	48	52
Aseptic Technique and Culturing Microbes		3	1	96	100
Microscopy for Microbiology		3	N/A	N/A	3
Bacterial Morphology and Staining Techniques		3	N/A	N/A	3
Serial Dilution and Viable Plate Counts		3	1	48	52
Motility Testing		3	N/A	48	51
Kirby-Bauer Diffusion Testing		3	1	48	52
Minimum Inhibitory Concentration Testing		3	N/A	48	51
Methyl Red and Vogues-Proskauer Testing		3	N/A	48	51
Carbohydrate Fermentation Testing		3	N/A	48	51
Catalase and Oxidase Testing		3	N/A	N/A	3
Starch Hydrolysis Testing		3	1	48	52
Selective and Differential Media Testing		3	1	48	52
Salt Tolerance and pH Testing		3	N/A	48	51
Fomite Transmission		3	1	48	52
Food Safety		3	1	48	52
Identification of an Unknown Microbe		3	N/A	N/A	3

Photo 1: Microbiology Assignment Calendar
(SAMPLE ANSWER BELOW)

7	8	9	10	11
Hand Washing - Plate Pouring	Hand Washing-Incubation	Hand Washing-Incubation	Hand Washing-Complete Exercises	Hand Washing - Submit Work
Hand Washing-Begin Exercises				Hand Washing Due Date

Exercise 2

Why should the incubation temperature for culturing microbes remain above 20°C?

Temperatures lower than 20°C will significantly increase the amount of time required for microbial growth.

Explain why you selected the location recorded in Panel 1 as the ideal incubation site for culturing microbes.

Student answers will vary but should include that the location was between 21°C and 25°C, secure from children and pets, and protected from direct light and drafts.

Data Table 2: Incubation Site Characteristics
(SAMPLE ANSWER BELOW)

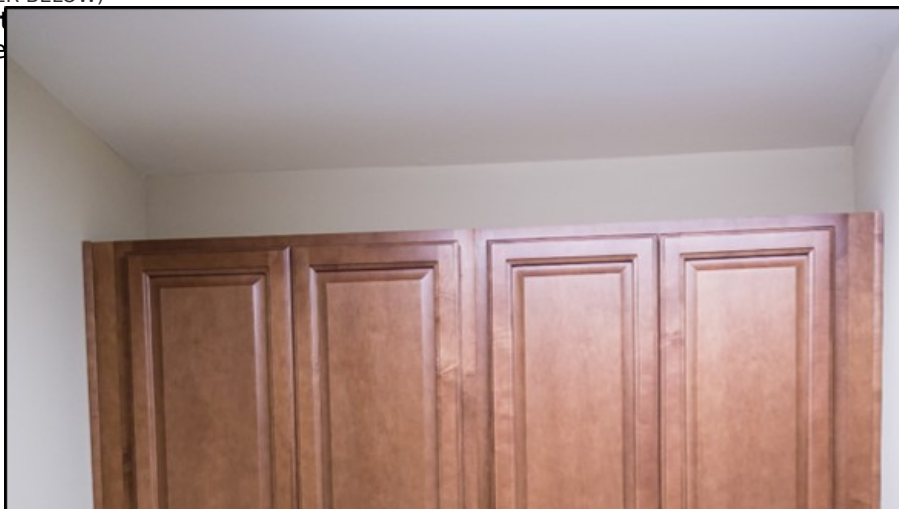
Location	Secure from Children and Pets (Y/N)	Temperature (°C)	Protected from Direct Light (Y/N)	Protected from Drafts (Y/N)
Instructor Note: student answers will vary but all should include potential incubation locations. Laundry Room Cabinet	Y	24	Y	Y
Bedroom Closet Top Shelf	Y	20	Y	Y
Bathroom Cabinet	N	21	Y	Y
Tool Drawer in Garage	Y	18	Y	Y

Panel 1: Final Incubation Location Description
(SAMPLE ANSWER BELOW)

Instructor Note: Student responses will vary but should describe an appropriate incubation location. For example, a cabinet in laundry room above clothes dryer would be an appropriate description for the photo included in this answer key.

Photo 2: Final Incubation Location
(SAMPLE ANSWER BELOW)

Note:
secure





Exercise 3

How should containers housing live cultures be labeled?

Broth tubes and agar plates should be labeled with a permanent marker to identify the media type and microbes they contain. Agar plates should always be labeled on the bottom half containing the agar, not on the lid.

When should hands be washed when working with cultures?

Hands should be washed before and after wearing gloves. Gloves should always be worn when working with cultures.

Data Table 3: Safety Scenarios
(SAMPLE ANSWER BELOW)

Scenario	Response
You must prepare your work surface for working with cultures.	Remove personal items, foods, and beverages. Wipe down surface with 70% isopropyl alcohol or a commercial disinfecting wipe.
You spill a liquid culture on the floor.	Cover the spill with paper towels and saturate the paper towels with 70% isopropyl alcohol. Allow the soaked paper towels to remain on the spill area for 15 minutes prior to disposal.
You must dispose of a culture.	Soak the container with media in a pure bleach solution for 2 hours before wrapping with paper towels and placing in the garbage. Secure all disposed cultures from children and pets.
You are pregnant and/or suffer from a compromised immune system and are considering working with cultures.	Consult with a physician before working with cultures.

Competency Review

Media provided in the lab kit should be stored in a(n) ____ upon arrival.

- ☐ autoclave
- ☒ refrigerator
- ☐ incubator
- ☐ freezer



Most Science Interactive microbiology experiments require an average time of ____ hours to complete.

- ☐ 2
 - ☐ 3
 - ☐ 10
 - ☒ 52
- ✓

Incubation temperatures should remain between ____ °C for cultures to develop within 1 to 3 days.

- ☐ 10-17
 - ☒ 21-25
 - ☐ 35-41
 - ☐ 10-35
- ✓

Individuals with compromised immune systems should consult their physicians before working with cultures.

- ☒ True
 - ☐ False
- ✓

It may be necessary to work on more than one experiment at a time to successfully meet microbiology assignment due dates.

- ☒ True
 - ☐ False
- ✓

A(n) ____ is an example of an appropriate incubation site for culturing microbes.

- ☐ exposed windowsill
 - ☐ unheated basement closet
 - ☒ empty laundry cabinet
 - ☐ coffee table top
- ✓

____ should always be performed before working with active cultures.

- ☐ Putting on protective gear
- ☐ Wiping down the work surface with alcohol or a disinfecting wipe
- ☐ Washing hands and forearms
- ☒ All of the above



Extension Questions

Tina is a microbiology student using a Science Interactive lab kit for her online course. She shares a small apartment with her two cats and has a full time job across town. Suggest two potential locations in the apartment for Tina to store the lab materials and incubate cultures. Explain why these locations are appropriate choices for Tina. (SAMPLE ANSWER BELOW)

The ideal location to store/incubate cultures in the small apartment would be inside a cabinet, away from food, or inside a small closet that can be secured from the cats. If these locations are not available, Tina could store/incubate cultures inside a sturdy box or container that cannot be opened or moved by the cats. All potential locations should be away from direct lighting and drafts at temperatures between 21-25°C.