SI Microbiology - Full Discipline Demo

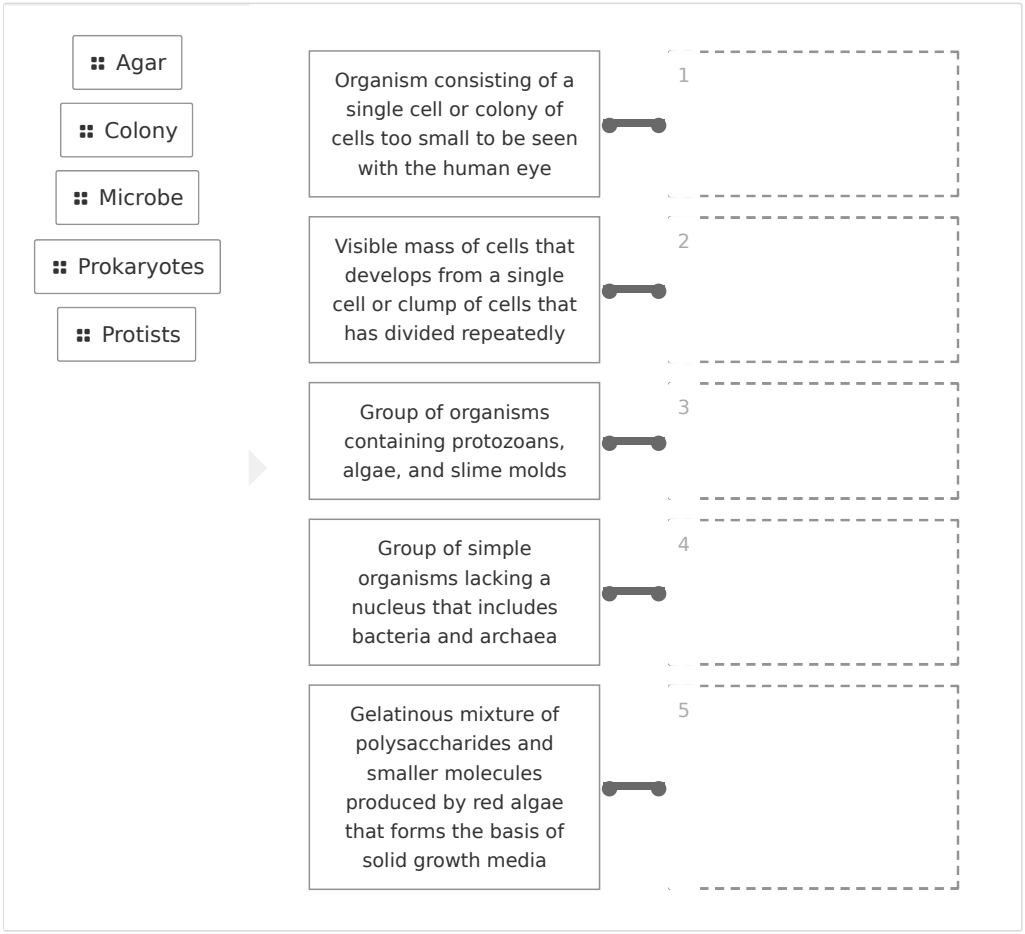
Ubiquity of Microorganisms

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

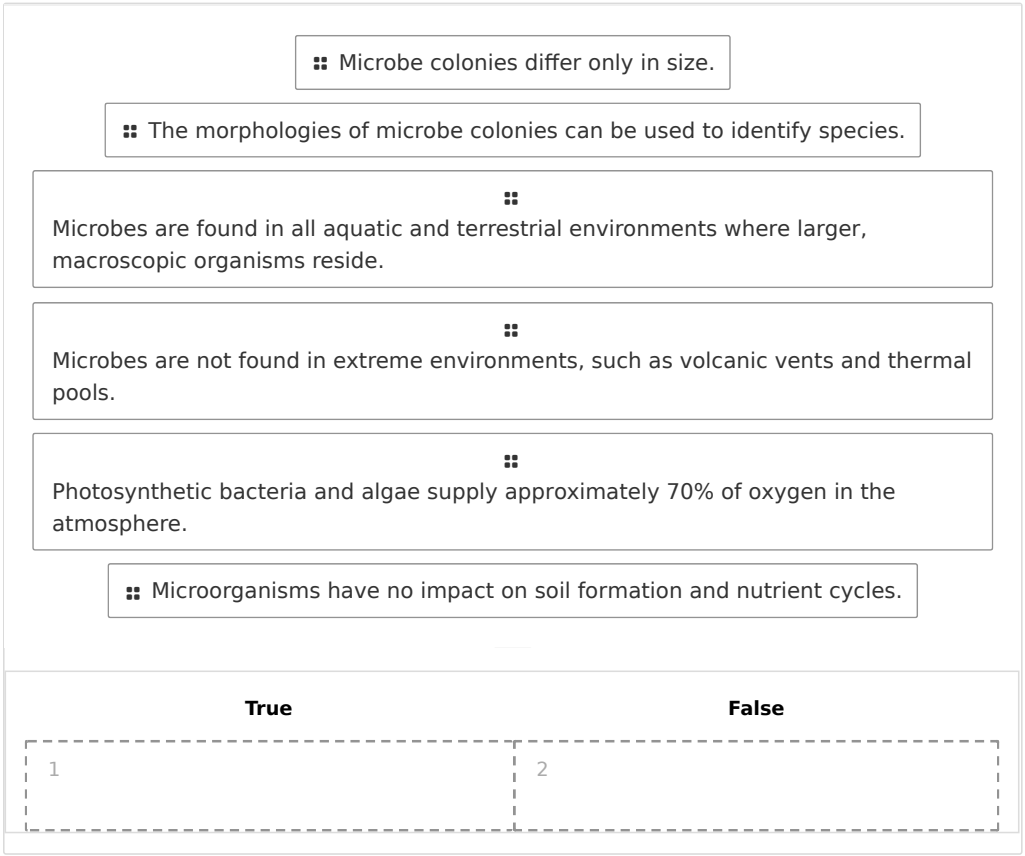
Match each term with the best description.



Correct answers:

1 Microbe 2 Colony 3 Protists 4 Prokaryotes 5 Agar

Identify each statement as true or false.



Correct answers:

1 The morphologies of microbe colonies can be used to identify species.

Microbes are found in all aquatic and terrestrial environments where larger, macroscopic organisms reside.

Photosynthetic bacteria and algae supply approximately 70% of oxygen in the atmosphere.

2 Microbe colonies differ only in size.

Microorganisms have no impact on soil formation and nutrient cycles.

Microbes are not found in extreme environments, such as volcanic vents and thermal pools.

Exploration

Microbes include the _____.

- prokaryotes
- fungi
- protists
- All of the above ✔

Photosynthetic bacteria and algae supply less oxygen than trees and grasses.

- True
- False ✔

Many microbes form _____ when grown on agar plates in the laboratory.

- colonies ✔
- leaves
- stems
- cavities

Exercise 1

Which sampling location provided the greatest abundance of microorganisms? Reference Data Table 1 and Photo 1 in your explanation.

Student results will vary. SI testing resulted in the skin sample producing the greatest total number of colonies. Student explanations should match their data and image in Photo 1.

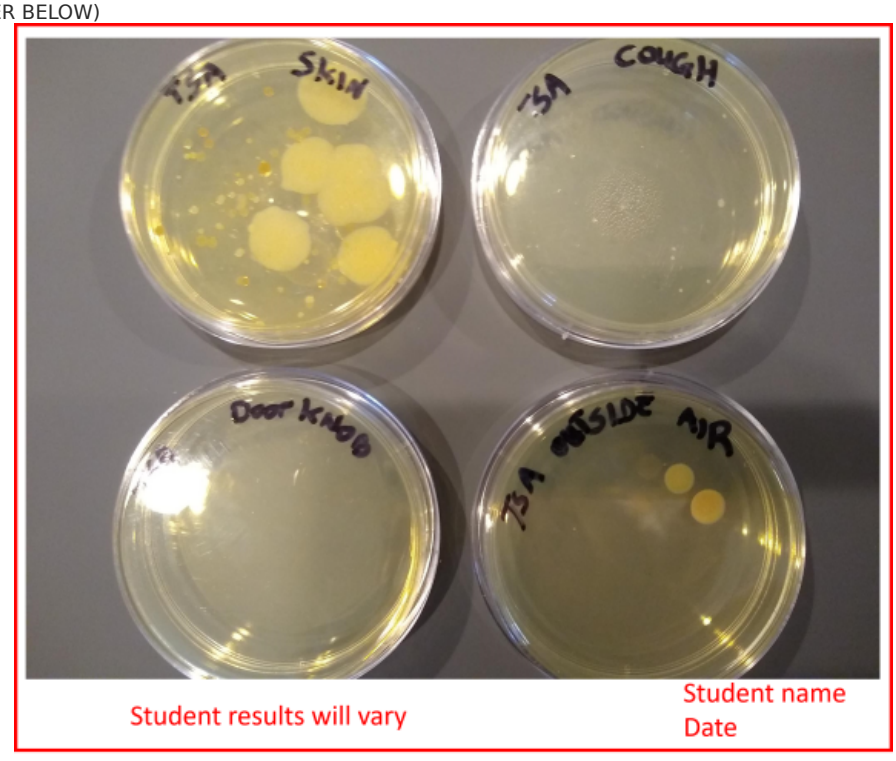
How did microbe diversity compare between your four sample locations? Reference Data Table 1 and Photo 1 in your explanation.

Student answers will vary. SI testing resulted in the skin sample having significantly higher diversity of colonies differing in morphology than the other three sample locations. Students answers should match their results recorded in Data Table 1 and Photo 1.

Were any microbe species ubiquitous to all four sampling locations? Reference the morphologies described in Data Table 1 in your explanation.

Student answers will vary. SI testing results did not include a common microbe between sampling locations as colonies differed in size, shape, color, and margin on each agar plate. Student explanation should be supported the morphology descriptions in Data Table 1.

Photo 1: Environmental Samples
(SAMPLE ANSWER BELOW)



Data Table 1: Observations of Microbial Colonies from the Environment and Human Body

(SAMPLE ANSWER BELOW)

Plate Label	Abundance	Diversity	Morphologies
Skin	Note to instructors: student results will vary but should match the images they upload in Photo 1. Science Interactive results: 48	4	White, circular, umbonate, curled; white, circular, raised, entire; yellow, white, circular, umbonate, curled; white, circular, raised, entire
Doorknob	1	1	clear, punctiform, convex, entire
Cough	11	1	amber, punctiform, convex, entire
Outside air	2	1	pink, circular, raised, undulate

Competency Review

_____ consist of simple cells lacking a nucleus and are the most numerous organisms on earth.

- Fungi
- Prokaryotes ✔
- Protists
- Algae

_____ are unicellular fungi that form clumps or strings of dividing cells.

- Bacteria
- Archaea
- Amoeba
- Yeasts ✔

Microbes function to _____ in the environment.

- produce oxygen
- cycle nutrients
- cause disease
- All of the above ✔

A microbe colony growing on an agar plate develops from a single cell or clump of cells.

- True ✔
- False

Microbe colonies of different species vary by _____.

- size
- shape
- color
- All of the above ✔

Sterile swabs should be moistened with _____ before collecting an environmental sample of microbes.

- alcohol
- bleach
- distilled water ✔
- saliva

Inoculated agar plates should be incubated in a warm, dark, location protected from children, pets, and drafts.

- True ✔
- False

Inoculated agar plates should be opened when examining microbe colonies collected from the body and environment.

- True
- False ✔

Environmental samples collected from the human skin and mouth result in identical numbers and types of observable colonies when cultured on agar plates.

- True
- False ✔

Extension Questions

A microbiology student was about to use a moistened, sterile swab to collect a microbe sample from a unique location when their baby began crying. The student placed the exposed swab on the work surface and attended to their child. Thirty minutes later the student returned to their experiment and wondered if the swab was still okay to use. Apply your knowledge of the ubiquity of microorganisms to advise the student whether to proceed with the previously moistened swab or select a new, unwrapped one in order to obtain unique results for the intended sample site. (SAMPLE ANSWER BELOW)

The student should select a new swab as the previously moistened swab will have been exposed to both airborne microbes and microbes on the work surface for the past 30 minutes. If using the exposed swab, the agar plate would be inoculated with a combination of microbes from the

sample site and from the microbes that collected on the swab while the student was attending to their child and, after incubation, produce colonies that were not unique to the intended collection site.