

Cells, Tissues, Organs & Systems Curriculum Map

Take a Fresh Approach to this Tricky Topic!

Focus on the structure and function of cells into tissues and organ systems. Students will recognize the major organs of the body and know their function, use appropriate vocabulary and describe explorations and observations, and identify the structural differences between plant and animal cells.

Overall Expectations

- Students will become familiar with the differences between unicellular and multicellular plant and animal cells.
- Students will have the opportunity to experience experimental design, procedure and analysis.
- Students will have the opportunity to explore the various structures involved in cellular life and the effects of outside influences upon these structures.
- Students will have the opportunity to reflect upon the importance of scientific inquiry to human health.

Teaching Instructions Includes:

- At A Glance – Skills List
- Teacher Assessment Rubric
- Student Self-Assessment Rubric
- Overall Expectations
- Introducing Unit to Students
- Vocabulary
- Planning Ahead
- Bulletin Boards, History of the Cell
- Evaluation Techniques
- Overheads #1-10

Answer Key

Lab Rules

Lesson Topics:

Lesson One: Prokaryotic Cells - Most Unicellular Organisms

Lesson Two: Multicellular Organisms

Lesson Three: A Day in the Life of a Uni

Lesson Four: Cello Jello

Lesson Five: Scrambled Cells

Lesson Six: What are Tissues, Organs and Systems?

Lesson Seven: Be Selectively Permeable

Lesson Eight: What's Special about Plants?

Lesson Nine: That's Life

Lesson Ten: Eat, Drink and Be Airy

Lesson Eleven: Adept at Adapting

Lesson Twelve: Osmosis and Diffusion

Lesson Thirteen: The Microscope

Lesson Fourteen: Pass the Salt Please

Lesson Fifteen: A Fair Test?

Lesson Sixteen: A Mini-Uni Fair

Lesson Seventeen: Neuron Relay

Lesson Eighteen: Interesting Interdependence

Lesson Nineteen: Dareto Compare

Lesson Twenty: Let's See How Much 'C'

Lesson Twenty-One: An Altered State of Cell

Lesson Twenty-Two: Blood Pressure



CELLS, TISSUES, ORGANS & SYSTEMS



Lesson Two: Multicellular Organisms

Teacher Notes: In multicellular organisms, cells are specialized and divide the work, rather than having each cell perform all the same functions. Specialization causes cell differences in structure, according to what is best suited to certain functions. The ability of specialized cells to complete other functions is decreased.

Vocabulary: eukaryotic cells, specialization

Hook: Create a banner with your school name and the word "factory" at the end. Introduce yourself as the plant manager and welcome all of your new employees along. Explain that they are privileged to be part of a group of people all making paper flowers. They each will be responsible for designing and making a 30-cm (12-in) high flower. (These can be used later to decorate your bulletin boards!) Challenge the students to work as quickly as they can. From the moment that you begin, time the process. Periodically tell the students the amount of time that has elapsed so far. Once all of the flowers have been made, announce the total time it took to complete the predetermined number of flowers.

Activities:

1. Specialization Demonstration

Materials: Various colors of paper, scissors and glue

Now, challenge the students to choose the design they like the best. Using this design as a template, divide the members of the class into teams and have each person specialize in a certain part of the flower making process. For example, have one student responsible for making stems, another petals, and yet another leaves. Give the students the same amount of time that it took them in the hook activity. At the end of the allotted time, count the total number of flowers created in the entire class and compare that with the total number of flowers created in the hook activity.

Discussion: Assuming that more flowers were created, discuss the reasons why the second process was more efficient. Relate their answers to the concept of specialization in cells.

Homework: Pose the question, "How does it benefit multicellular organisms to have cell specialization?"



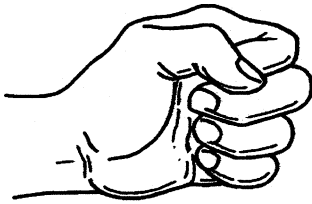
CELLS, TISSUES, ORGANS & SYSTEMS



2. Rock-Paper-Scissors

Materials: Playdough, a piece of paper or pencil per student

Students will be directed to play Rock-Paper-Scissors. On the count of three, students choose to make either the rock (symbolized by a fist), paper (symbolized by a flat hand, fingers together) or scissors (symbolized by a hand, baby finger to ground with fingers split to form a 'V'). Each time after the decision has been made the students are asked to perform a task. Students may note which tasks their choice of 'hands' are best suited for. Tasks may include: flattening a ball of Playdough, shaking someone's hand, picking up a pencil or piece of paper.



Note: If this hand feature were permanent, it would be a form of specialization or adaptation.

Homework: Brainstorm a list of animals or plants which clearly have a physical specialization for their environment.

Suggested Evaluation: Completion of homework, daily mark for participation in class.