

# Levels of Cellular Organization

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<b>Strand</b>	Cellular Organization
<b>Topic</b>	Investigating patterns of cellular organization in living things
<b>Primary SOL</b>	LS.3 The student will investigate and understand that living things show patterns of cellular organization. Key concepts include a) cells, tissues, organs, and systems; and b) patterns of cellular organization and their relationship to life processes in living things.
<b>Related SOL</b>	LS.2 The student will investigate and understand that all living things are composed of cells. Key concepts include a) cell structure and organelles.

## Background Information

Each organism is made up of cells, tissues, organs, and organ systems. In order for a complex organism to survive, its various levels must function smoothly and work together. Whether multicellular or unicellular, an organism’s structures must perform specific functions to maintain stable life conditions.

## Materials

- Heavy white paper to create foldables
- Crayons, colored pencils, markers
- Textbook transparencies, Internet/library resources for example illustrations
- Graphic organizer/foldable sample to present to class

## Vocabulary

*arrangement, cell, cellular organization, complex, function, multicellular, organ, organ system, organism, process, relationships, specialized, stable, tissue, unicellular*

## Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Distribute a sheet of heavy white paper to each student. Have students fold the papers in half vertically and use pencils to draw lines dividing the “hot dog” style folded paper into four equal boxes.
2. Direct students to label the four boxes (or doors), from top to bottom, “Cells,” “Tissues,” “Organs,” and “Organ Systems.” These doors could also be used to illustrate the four levels. The exterior of the paper should now look like the diagram at right. When the doors are opened flat, the interior will expose two columns for listing detailed information. Possible content is listed on the attached Sample Foldable Template and Content, but it may be modified as desired.
3. Place students in small groups, and encourage each group to fill in their own

Cells
Tissues
Organs
Organ Systems

important facts based on text information, Internet research (if available), or library resources. Have groups share facts with the class to make a collaborative detailed chart of information. Display this list in the classroom until formal assessment.

### **Assessment**

- **Questions**
  - Why do organisms require different levels of cellular organization?
  - What are the four levels of organization?
  - Do unicellular organisms have levels of organization? Explain your answer.
- **Journal/Writing Prompts**
  - Explain how cellular organization compares to the organization of topics in a textbook.
  - List examples of organisms that contain cells, tissues, organs and organ systems.
- **Other**
  - Describe the structures required for one human body organ system.

### **Extensions and Connections (for all students)**

- Have students create a board game to play in class. Students will develop a game board, question cards with answers, game pieces and playing instructions. Teachers can bring in common board games to use as examples and provide poster board for each group to begin. These games could be saved and reused later in the year as review.
- To complete SOL LS.3 content, students could add question cards relating to osmosis, diffusion, and other life processes as a culminating project.

### **Strategies for Differentiation**

- Have a created set of defined information to be included inside the foldable.
- If student knowledge is affirmed, allow students to sort and list information in the appropriate sequence.

# Sample Foldable Template and Content

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<p>Cell: basic unit of structure and function in a living thing Complex organisms are composed of MANY cells.</p> <p>_____</p>	<p>The cell is the smallest unit of cellular organization. The human body consists of approximately 100 trillion cells.</p> <p>_____</p>
<p>Tissue: a group of similar cells that perform the same function</p> <p>_____</p>	<p>Tissue is the next largest level of organization.</p> <p>_____</p>
<p>Organ: a structure composed of different types of tissues</p> <p>_____</p>	<p>Examples of organs in the human body include the heart, the brain, the lungs, and the stomach.</p> <p>_____</p>
<p>Organ System: Each organ within the human body is part of an organ system.</p> <p>_____</p>	<p>Organ systems are the largest level of cellular organization. The human body contains 11 organ systems, including skin, skeletal, nervous, respiratory, and digestive.</p> <p>_____</p>