Organization of Living Things

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Describes how the organization of living things includes cells, tissues, and organs, and how they correspond with their environment above the individual organism.

What you will learn

- Levels of organization of living things within an organism
- Levels of organization in the biosphere above the individual organism
- Diversity of life on Earth

What does ‘Organization of Living Things’ mean?

We know it all starts with the cell. And for some species, it ends with the cell. But for others, the cells come together to form tissues, tissues form organs, organs form organ systems, and organ systems combine to form an organism.

Levels of Organization

The living world can be organized into different levels. For example, many individual organisms can be organized into the following levels:

- **Cell**: Basic unit of structure and function of all living things.
- **Tissue**: Group of cells of the same kind that perform the same function.
- **Organ**: Structure composed of two or more types of tissues. The tissues of an organ work together to perform a specific function. Human organs include the
brain, stomach, kidney, and liver. Plant organs include roots, stems, and leaves.

- **Organ system**: Group of organs that work together to perform a certain function. Examples of organ systems in a human include the skeletal, nervous, and reproductive systems.
- **Organism**: Individual living thing that may be made up of one or more organ systems.
There are also levels of organization above the individual organism.

- Organisms of the same **species** that live in the same area make up a **population**. For example, all of the goldfish living in the same area make up a goldfish population.
- All of the populations that live in the same area make up a **community**. The community that includes the goldfish population also includes the populations of other **fish**, coral, and other organisms.
- An **ecosystem** consists of all the living things (**biotic factors**) in a given area, together with the nonliving environment (**abiotic factors**). The nonliving environment includes **water**, sunlight, and other physical factors.
- A group of similar **ecosystems** with the same general type of physical environment is called a **biome**.
- The **biosphere** is the part of Earth where all life exists, including all the land, **water**, and air where living things can be found. The biosphere consists of many different biomes.

**DID YOU KNOW?**

An average **human body** has about 38 trillion cells! However, they can be grouped into just four major tissue types which include epithelial tissue, muscular tissue, connective tissue, and nerve tissue.
Diversity of Life

Life on Earth is very diverse. The diversity of living things is called biodiversity. A measure of Earth’s biodiversity is the number of different species of organisms that live on Earth. At least 10 million different species live on Earth today. They are commonly grouped into six different kingdoms. Examples of organisms within each kingdom are shown in the Table below.
### Summary

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><img src="archaea.png" alt="Figure2" /></td>
<td>Archaea</td>
<td><img src="bacteria.png" alt="Figure3" /></td>
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<tr>
<td><img src="protist.png" alt="Figure4" /></td>
<td>Protist</td>
<td><img src="fungus.png" alt="Figure5" /></td>
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<td><img src="plant.png" alt="Figure6" /></td>
<td>Plant</td>
<td><img src="animal.png" alt="Figure7" /></td>
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</tbody>
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Summary

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• Many individual organisms can be organized into the following levels: cells, tissues, organs, and organ systems.
• An ecosystem consists of all the populations in a given area, together with the nonliving environment.
• The biosphere is the part of Earth where all life exists.
• The diversity of living things is called biodiversity.

Review
1. Describe the levels of organization of a complex, multicellular organism such as a mouse, starting with the cell.
2. Explain how a population differs from a community.
3. What is an ecosystem?
4. Give three examples of the nonliving environment.
5. What is biodiversity?

Vocabulary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>biodiversity</td>
<td>the variety of life within a particular habitat, often measured by the number of different species.</td>
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<tr>
<td>biosphere</td>
<td>highest level of organization in ecology that includes all the parts of Earth where life exists, including Earth's surface, atmosphere, and hydrosphere.</td>
</tr>
<tr>
<td>cell</td>
<td>basic unit of structure and function of living things.</td>
</tr>
<tr>
<td>organ</td>
<td>structure composed of two or more types of tissues that work together to perform a particular function.</td>
</tr>
<tr>
<td>organ system</td>
<td>group of organs that work together to perform a particular function.</td>
</tr>
<tr>
<td>organism</td>
<td>an individual living thing.</td>
</tr>
<tr>
<td>tissue</td>
<td>group of specialized cells of the same kind that perform the same function.</td>
</tr>
<tr>
<td>population</td>
<td>all the organisms of the same species that live in the same area.</td>
</tr>
</tbody>
</table>