
Unit 4: Human Systems

Unit Overview:

1. Students will begin their study of Human Systems by completing a pre-assessment for the hierarchy of our body, the human systems and how they function together. After a brief introduction of the human systems, they will conduct investigations to understand how the human body is organized. They will investigate the characteristics of cells, tissues, organs, and organ systems.
2. Students will then study the organization and functions of the major human systems. We will study the respiratory, circulatory, excretory, digestive, skeletal, muscular, nervous, and endocrine systems. At the end of this section, the students will review the organ systems and how they function together to carry out our life functions.
3. At the end, there will be a small section on human diseases. Students will compare infectious and genetic diseases. They will then complete research and a PowerPoint presentation on a disease of their choice.

Lesson 4:1: Discovering Levels of Organization: Day 2

Objective(s):

Students will show the levels of cellular organization by constructing a model of cells, tissues, organs, and organ systems.

Skills attained:

Following procedures
Modeling
Analyzing
Explaining
Rewriting procedures
Disadvantages and advantages

Topics:

Levels of Cellular Organization

- Cells
- Tissues
- Organs
- Organ systems

Vocabulary:

- **Cell** – the basic unit of structure and function in a living thing
- **Tissue** – a group of similar cells that perform the same function

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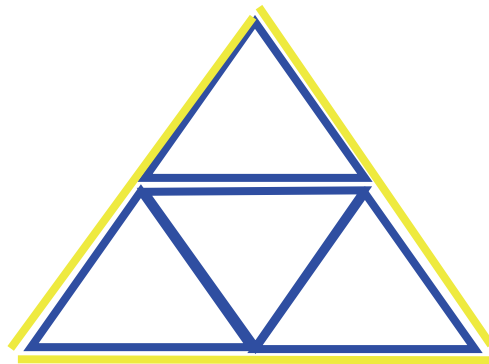
- **Organ** – a structure in the body that is composed of different kinds of tissue

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- **Organ systems** – a group of organs that work together to perform a major function in the body

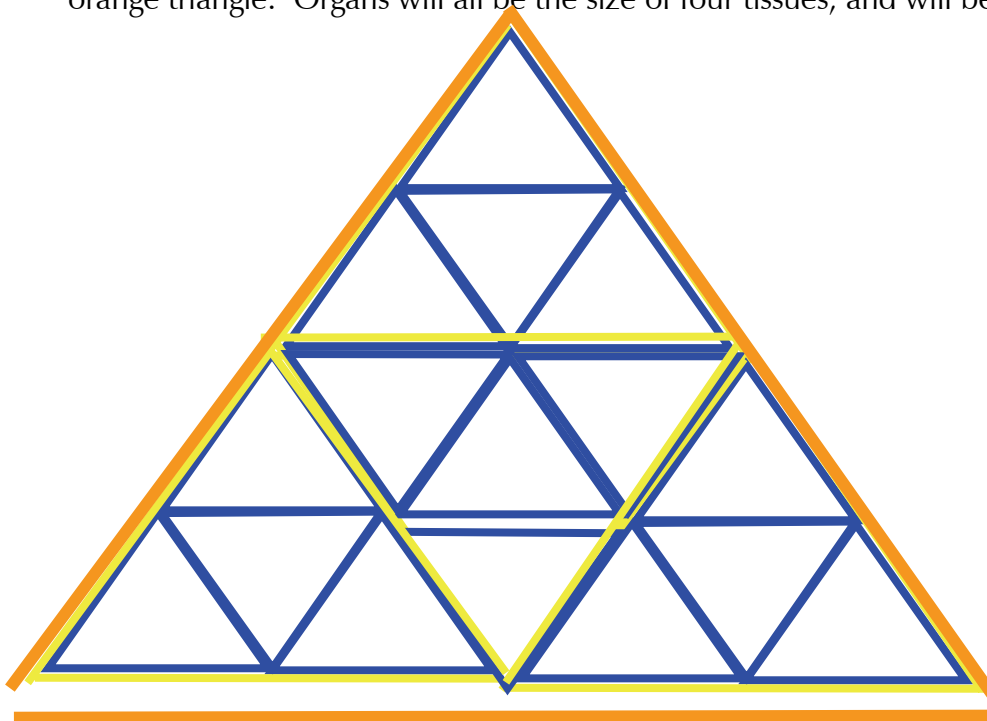
Procedure:

1. Pass out the materials to the students. Students should work individually or with a partner. Larger groups will make the activity more difficult.
2. Students will use the modeling clay and toothpicks to make a 3:D model of a cell. The cell should be in the shape of a triangle. The students need to make enough cells to allow them to place the cells together and form a pyramid (they will need 4 for each pyramid they make). Remind students not to use too much clay or they won't fit and line up. Demonstrate how to make a cell.
3. You might want to have a model of a cell, tissue, organ, and organ system already constructed to show the class.
4. If the students can use the modeling clay and toothpicks, they can draw a small triangle on blue construction paper for the cell. They will need four to make the tissue.
5. Have students combine the cells to make a tissue. They will take four triangles and attach them together to make a pyramid. They will
 - If they are using the construction paper, combined four small blue triangles to make a larger triangle. The larger triangle represents the tissue. Glue the blue triangles on a yellow triangle. Tissues will all be the size of four cells, and will be yellow.



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6. Students will then take four pyramids and place them together to make a cube. The cube will represent the organ. You will need at least two organs to make an organ system.
 - If they are using the construction paper, combined four yellow triangles (one of the triangles should show the 4 blue triangles glued to the tissue) to make a larger triangle. The larger triangle represents the organ. Glue the yellow triangles on an orange triangle. Organs will all be the size of four tissues, and will be orange.



7. Two or more cubes will be combined to make a tower. The tower will represent the organ system.
 - If they are using the construction paper, combined four orange triangles to make a larger triangle. The larger triangle represents the organ system. Glue the orange triangles on a green triangle. Organ systems will all be the size of four organs, and will be green.
8. Have students answer the questions from **Activity 4:1: Discovering Levels of Organization** in complete sentences. Discuss answers with the class. Have some volunteers draw their sequence chains on the board.

Materials list:

Activity 4:1: Discovering Levels of Organization

For each person or set of partners you will need
Toothpicks (at least 1/3 of the box)
Modeling clay

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Motivation:

If possible, show students a model of a cell, tissue, and organ. Show students other examples of hierarchies. You can have students access their prior knowledge of the hierarchy of the universe.

Description:

Students will be constructing a model of the levels of organization in the human body. They will analyze their model in order to construct a graphic organizer of the organization of the body and support the statement, “Organs contain cells.”

Content Background:

The human body is made up of many parts. Each part has a specific function. When these parts are grouped together to complete a specific task, they form a level of organization. Specialized parts work together to keep us alive. In this activity, you will discover how cells, tissues, organs, and organ systems are organized.

The levels of organization in the human body consist of cells, tissues, organs, and organ systems. An example of the levels of organization in the human body is: bone cells join and work together to form bone tissue, bone tissue join and work together to form bones (the organs), and bones join and work together to form the skeletal system (organ system).

Cells carry out the processes that keep organisms alive. There are four types of tissues: muscle, nerve, connective, and epithelial. Organs and tissues both perform specific jobs. The job of an organ is more complex than the job of a tissue. Organs work together as an organ system to perform a major function. Different organ systems function together and depend on one another. For example, the respiratory and circulatory systems work together as the cardiovascular system to provide oxygen to your cells.

Suggested Teaching Strategies:

This lesson is designed to construct a 3-D model to represent the levels of organization in the human body. If the students cannot make the 3-D, teachers can follow the directions for a model using construction paper.

Lecture Support:

Class Notes 4:1a and 4:1b.

Assessment:

Analysis Questions

Homework:

Analysis Questions

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Performance Assessment:

“Knowledge Ticket: Levels of Organization (Human Body)” Our model showed how the human body was organized. Explain what each level of our model represented. Explain how the levels of the human body work together for us to function and survive. What do you think will happen if part of the model or part of our organ system was removed or damaged? Explain.

Criteria:

The essay should include:

Answer the question completely

Use correct vocabulary and terminology

Your answer is logical

Your answer is supported with information from the activity and prior knowledge

Rubric:

Four points:

- Answer the question completely
- Use correct vocabulary and terminology
- Your answer is logical
- Your answer is supported with information from the activity and prior knowledge

Three points:

- 3 of the 4 above are included

Two points:

- 2 of the 4 above are included

One point:

- 1 of the 4 above is included

Zero points:

- No serious attempt is made

Lesson 4:2: Magic Squares: Day 3

Objective(s):

Students will define vocabulary terms related to our human systems in order to complete the magic squares.

Skills attained:

Following procedures

Defining

Calculating sums

Utilizing resources