Hierarchy

Lesson Concept Living things demonstrate a hierarchy of structure from cells to tissues to organs to organ systems to organism.

Link This is the first lesson in the unit.

Time 45 minutes

Materials

Whole class

1 Set of hierarchy necklaces (see advance preparation, R1)

Yarn for necklaces

Single hole-puncher

Per Groups of 4 students

3-4 Pictures of living things (e.g., plant, tree, horse, puppy, human)

Person Lego model (see advance preparation)

Partners

Hierarchy card sets (see advance preparation, R2)

Hierarchy reading (R3)

Individual

1 3 x 5 exit card or sticky note

Advance Preparation

1. Build (don't use a prefabricated lego person) a lego model (2-3 inches high) of a person for each group
2. Make a building block necklace for the class. Duplicate the hierarchy cards (R1). Hole punch each card and thread yarn through it to make one necklace for each card. Consider laminating the set for future use.
3. Print pictures of living things for each group.
4. Duplicate and cut hierarchy card (R2) sets so that half of the partner groups have the circulatory set and half of the partner groups have the digestive set. Consider laminating the set for future use.
5. Duplicate the hierarchy chart (R3) for each set of partners.

Procedure

Engage ***(10 minutes) Living things are made of smaller components.***

1. Distribute pictures of living things to each group. Ask students, "What are these living things made of?"
2. After a few minutes, select a couple of students to share out their observations and chart their responses.

Teacher Note: Accept whatever statements students make; you will return to this chart at the end of the lesson to see how the students have changed their thinking.

Explore #1 ***(10 minutes) Living things are made of smaller parts.***

3. Distribute a Lego person to each group. Ask groups to describe the object.
4. Have groups disassemble and reassemble the person. Ask students, "What do you notice about the figure? Conduct a discussion about the structure of the person: it is made of smaller parts; needs all of the parts to make a person.
5. Refer to the chart from the Engage. Ask students to identify the parts that they noted from the living things pictures. Circle the parts.
6. Explain that organisms are made of parts that are made of even smaller parts.

Explore #2/ Explain ***(15 minutes) Living things are organized in levels from atoms, molecules, cells, tissues, organs, organ systems, to organisms.***

7. Distribute the "hierarchy" reading chart (R3). Have partners discuss what each component is.
8. Select 7 students and ask them to come to the front of the class. Give each a "hierarchy necklace" and ask the class, based on their reading to arrange the students, from the smallest to the largest. Conduct a discussion based on how the class wants to arrange the students.
9. Remove the necklaces and tape them on the board in the appropriate order (smallest to largest).
10. Divide the groups of four students into 2 sets of partners. Distribute a different set of hierarchy cards (R1 or R2) to each partner set.
11. Ask partners to arrange their cards in an order from smallest to largest.
12. Ask the partners to share with their group of four how they arranged their cards. What was their reasoning? What is common in each of the sets of cards? What is different? Why did they organize them they way they did
13. Ask several groups to share their discussion with the whole class.

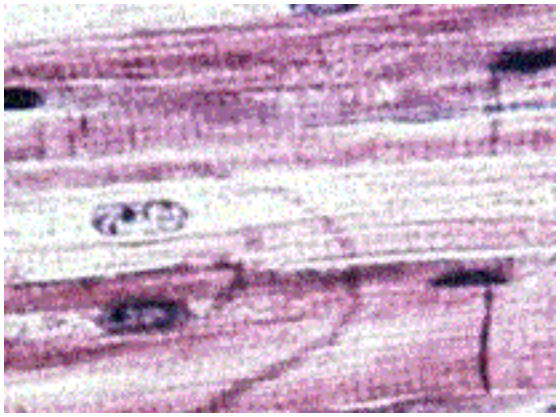
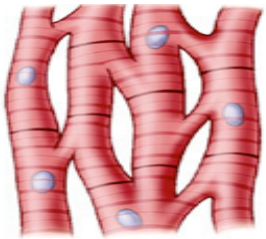
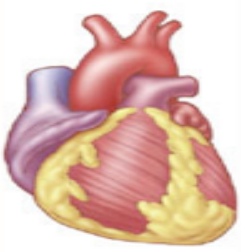
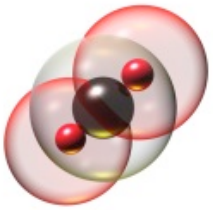
14. Ask the whole class, “How does this relate to the Lego person?” Conduct a discussion making sure that students recognize that complexity increases from smallest to largest to make the organism.

Extend/Evaluate (5 minutes) Living things demonstrate an organizational hierarchy.

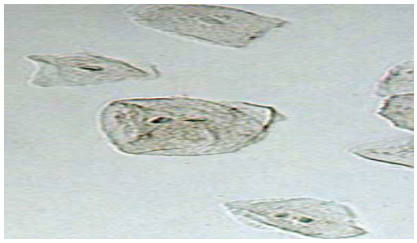
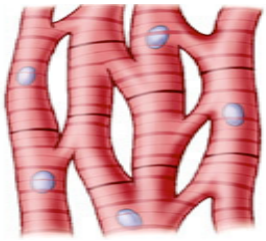
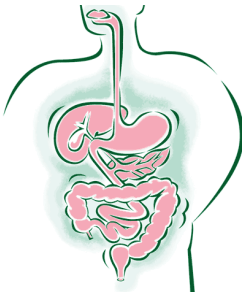
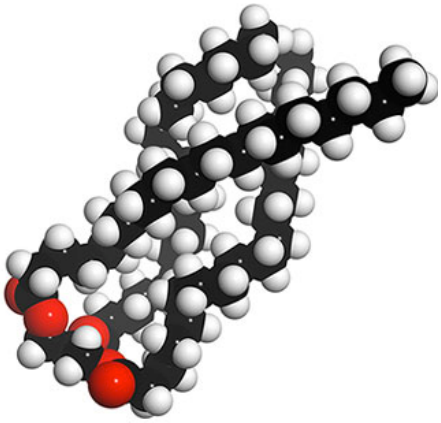
15. Return to the chart created in Engage and refer to the hierarchy cards on the board. Ask students if they would like to change or add anything to the chart and record their ideas.
16. Distribute a 3 x 5 “exit” card and ask students to write what they now know about how living things are structured (put together).

atom	molecule
cell	tissue
organ	organism
organ system	

Circulation

 cell	 tissue
 organ	organism
organ system	 molecule

Digestive System

 cell	 tissue
organ	organism
 organ system	 molecule

Component	Definition	Example
Molecules	Different atoms bonded together	DNA, protein, lipids (fat), carbohydrates, water, salt, carbon dioxide, glucose
Cells	the smallest unit that is capable of carrying out all life processes	blood cells, cheek cells, skin cells
Tissues	A group of cells, not necessarily the same kind, that work together to perform a specific task	connective, nervous, muscle
Organs	a group of different tissues that form a singular unit and perform a similar function (job)	Heart, brain, kidney, skin
Organ systems	a group of organs that interact to perform a similar function, e.g., circulatory system, excretory system	Circulatory system, digestive system, excretory system, nervous system, respiratory system
Organism	an individual living thing	Humans, bird, earthworm, octopus, plant, tree