Unit Essential Question

How do body systems interact with each other to communicate and collaborate?

Introduction

In order for students to understand how all the parts of the body work together, they need to start small. First students will identify that all living things are made of cells. Then students will determine that living things are made of many different types of cells with different functions. The cells all work together to help a body stand up, move, feel, breathe, and protect itself from invaders.

Objectives

Students will be able to

Content

• Provide evidence that living things are made of many different types of cells.

Science and Engineering Practices

• Analyze data gathered from an investigation.

Equity and Groupwork

• Discuss and share observations.

Language

• Draw and label pictures of cells.

Assessment

- 1. Have students independently complete the Task 1 section of the Individual Project Organizer as homework or in class, depending on students' needs and/or class scheduling.
- 2. Collect Individual Project Organizers and assess them using these criteria:
 - "Carrying Out Investigations" row of the Science and Engineering Practices Rubric
 - "Analyzing and Interpreting Data" row of the Science and Engineering Practices Rubric
 - "Constructing Explanations and Designing Solutions" row of the Science and Engineering Practices Rubric
- 3. Return the Individual Project Organizers, and give students time to make revisions. ELLs may need additional time.

Academic

Vocabulary

- bone
- cell
- muscle
- nerve
- organism

- red blood cell
- red
- skin
- small intestine
- tissue

Language of Instruction

- caption
- refute
- zoom in



LANGUAGE SUPPORT STRATEGIES

Add the new vocabulary terms to the poster currently displayed in the classroom.

Timing

This task can be completed in 4 class periods (based on 45-minute periods).

- Part I What Are All Living Things Made Of? (1 class period)
- Part II Cell Type and Tissue Type Resource Cards
 - Stations (1 class period)
 - Debrief (1 class period)
- Part III Connect to the Culminating Project and Assessment (1 class period)

Student Materials

- Cell Type and Tissue Type Resource Cards: Fat Cells card found at the end of Task 1 (1 per table)
- Cell Type and Tissue Type Resource Cards found at the end of Task 1 (1 card per station)

Preparation of Cell Type and Tissue Type Resource Cards

- 1. Print one Fat Cells Resource Card for each table found at the end of this task (for students to use as a model). Ideally, print in color and laminate or put in plastic covers.
- 2. Print several sets of the Cell Type and Tissue Type Resource Cards found at the end of this task. Place one card at each station. (If you have more than six groups, you may need to create more than one station for each card to accommodate all the groups.) You will use the additional sets to help groups who need more time to complete their Cell Function Data Table. Again, print in color and laminate if possible.

Teacher Materials

- "What Are All Living Things Made Of" digital slide presentation
- Optional: microscope

Background Knowledge

All living things are made of cells.

Part I • What Are All Living Things Made Of?

The goal of this activity is to introduce students to the concept that all living things are made of cells, and to introduce the microscope as a tool that can be used to gather cell data.

1. Show the "What Are All Living Things Made Of?" digital slide presentation to guide students through Part I of the task.



LANGUAGE SUPPORT STRATEGIES

For ELLs to maintain the pace of the content delivery, go through the cell presentation during their completion of the Claim, Evidence, Reasoning chart. Pause during each step and invite them to verbalize what they are thinking before they write (Think-Pair-Share or just aloud). Listen for academic vocabulary and mirror students' statements back to them in complete sentences (recast as necessary).

- 2. Ask students to make a claim about what cells are made of. You can ask students to think-pair-share before they individually record their claim in their Student Edition.
- 3. Describe a microscope and how scientists use the microscope to see cells, watch cells, and sometimes collect data about cells. Show students a microscope if you have one available.
- 4. Have students fill out the evidence box in their Student Edition. Students will draw four pictures of cells—animal, plant, bacteria, and non-living, one picture in each box.
- 5. Have students make observations about the cells they drew and then share those observations with the class. Then readdress the question, "What are all living things made of?"
- 6. Work with the class to define *cell*.
- 7. Ask students to write a reasoning statement in their data table to address their claim. Remind students to use evidence when writing the reasoning statement.
- 8. Have students share their claim, evidence, and reasoning statements with the class.

Part II • Cell Type and Tissue Type Resource Cards

The goal of this activity is for students to recognize that there are different types of cells in living things, and that these cells have different jobs (functions) in our body.

- 1. Set up six stations, one for each of the Cell Type and Tissue Type Resource Cards. If you have more than six groups in a class, you may need to create more than one station for each card to accommodate all the groups.
- 2. Use the Fat Cell Resource Card as a model for the activity. The Fat Cell Resource Card is reproduced in the "What Are All Living Things Made Of" digital slide presentation to refer to during the modeling session.
- 3. Hand out the Cell Type and Tissue Type Resource Cards to each group (or to each student depending on your pedagogical approach).
- 4. Assign student roles and review the Behavior Norms from the *Orientation to Groupwork* unit. Remember it is important to rotate student roles daily or when beginning a new section so everyone has the chance to play different roles.

- 5. Read the research question with students.
- 6. Have the groups discuss a possible claim and then fill in the claim row in their group data table.
- 7. Once you are sure that students understand the activity, tell groups to move through each station. Give students a set amount of time at each station. If you don't have a large visible timer, use the stopwatch link shown on the digital slide presentation. To use the timer Full Screen, click on "Use Countdown Timer in Full Screen" under the second blue bar. After you set the time, press "set" again to find the "Start" and "Clear" buttons.



LANGUAGE SUPPORT STRATEGIES

Offer sufficient wait time and consider pacing of the modeling for ELLs at varying proficiency levels in class.

- 8. Have students move back to their seats. If any groups need more time for a station, hand out the needed Cell Type and Tissue Type Resource Cards to groups after they finish rotating through the stations.
- 9. Have each group return to the research question. Have the groups discuss and record their evidence and reasoning to determine their answer to the question.
- 10. Gather the groups back as a class. Ask groups to share their claim, evidence, and reasoning. Conduct a discussion on how they think cells and tissues are related, giving examples from their Cell Function Data Tables.

Part III • Connect to the Culminating Project and Assessment

- 1. Have students independently complete the Task 1 section of the Individual Project Organizer as homework or in class, depending on students' needs and/or class scheduling.
- 2. Collect the Individual Project Organizers and assess them using these criteria:
 - The "Carrying Out Investigations" row of the Science and Engineering Practices Rubric
 - The "Analyzing and Interpreting Data" row of the Science and Engineering Practices Rubric
 - The "Constructing Explanations and Designing Solutions" row of the Science and Engineering Practices Rubric
 - A criterion of your choice
- 3. Return the Individual Project Organizers and give students time to make revisions.