

## Unit Essential Question

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

## Introduction

Any team or group sport or activity—like kickball, playing in a band, or building a house—requires some *communication* and *collaboration* between the people involved so that they can accomplish their function or what they want to do (win the game, play a song well, build a house). To experience communication and collaboration, students will play a game of soccer or kickball.

## Objectives

Students will be able to

### Content

- Identify how an individual part is important to the whole system.

### Science and Engineering Practices

- Design and create a model.

### Equity and Groupwork

- Communicate and collaborate to encourage the success of a team.

### Language

- Orally explain their poster to the class.

## Assessment

1. Have students independently complete the Lift-Off Task 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:
  - “Developing and Using Models” 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. ELLs may need additional time.

## Academic Vocabulary

- collaboration
- communication
- function

## Language of Instruction

- caption
- highlight



### LANGUAGE SUPPORT STRATEGIES

Post the academic vocabulary in the classroom and display an image that depicts each term:

- communication (e.g. two people talking on cell phones in different countries)
- collaboration (e.g. picture of a rowing team in boat)
- function (e.g. feathers on a bird to show they help bird survive)

## Timing

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

- Part I • Play Soccer or Kickball (1 class period)
- Part II • The Poster
  - Discuss and make a poster (1.5 class period)
  - Share posters (0.5 class period)
- Part III • Connect to the Culminating Project and Assessment (1 class period)

## Student Materials

per group

- Soccer or kickball ball
- Soccer or kickball game materials (cones for goals, bases, team identifiers)
- Poster paper (1 sheet per group)
- Colored markers or pencils (1 set per group)

## Background Knowledge

The Lift-Off Task introduces three overarching themes found in the Cells and Body Systems unit: collaboration, communication, and function. The body is a group of interconnected subsystems that communicate and work together toward the greater goal of life. These interconnections are true at all scales of functioning: from one single cell all the way up to the whole body itself.

1. **Collaboration:** Collaboration is the idea of working together to create a final product. In this Cells and Body Systems unit, students find that cell parts (mitochondria and chloroplasts) work together to make a cell work. They find that animal and plant cells indirectly work together for our survival. They find that similar cells work together (muscles) to result in one function for our survival. They find that groups of different cells form organs (lungs) that work together for one function (respiratory system), again for our survival. And finally, all the body systems work together to form a living thing (human).
2. **Communication:** Communication is the exchanging of information between people or places. In this Cells and Body Systems unit, students are introduced to the idea that there is communication between cell parts, between cells, between body parts, and between the environment and the human body. Communication enables living things to survive.
3. **Function:** Function is how things work. In this Cells and Body Systems unit, students are asked about the function of cell parts, cells tissues, organs, body systems, and the body. Many students confuse the concept of function with the physical description of the part. For example, if you ask students what the function of skin is, a student might respond with “something that covers the body” rather than “something that protects the body.” “Covers” is not a function, only a description. “Protects” is a function that helps us survive. Often it is necessary to probe students further and ask questions such as “Is that really why that cell part/body part/body system is there?” to get students to the level of function rather than description.

## Part I • Play Soccer or Kickball

### Before the Game

1. Connect the soccer or kickball game to science class.
  - Tell students that in order to better understand the body's parts and how they work together, students are going to put their bodies in action.
  - During the game, students should think about how they are working together to help the team.
2. Review the rules of soccer/kickball.

### Playing the Game

1. Have students play soccer or kickball.
2. You or the team captains can provide some direction to players during play (theme of communication).
3. Give time to let students cool down before returning to class.
4. Students should reflect on the game and reflect on the three bullet points found in their Student Edition in their science notebook. Students can do this in class or as homework.



#### LANGUAGE SUPPORT STRATEGIES

Optional: Provide sentence frames for English Language Learners, such as:

- I worked with others to help my team by \_\_\_\_ and \_\_\_\_.
- I communicated with my team by \_\_\_\_ and \_\_\_\_.
- \_\_\_\_ and \_\_\_\_ were jobs that helped my team by \_\_\_\_.

## Part II • The Poster

1. Introduce the definitions of communication, collaboration, and function, and elicit one example from the class relating to the soccer/kickball game for each word. Do not let this conversation go into depth or extend to a full class period discussion.
2. Ask students to assume their groupwork roles.
3. Give groups time to discuss how the the ways that individual players helped the team (Part II Number 1 found in the Student Edition) before you hand out the poster paper.



### LANGUAGE SUPPORT STRATEGIES

Offer the following sentence frames:

	Emerging →	Expanding →	Bridging →
<b>Communication</b>	One player communicated by ____.	The players communicated when they ____.	The players communicated in several ways including ____.
<b>Collaboration</b>	The players worked together as a team when they ____.	The team collaborated when ____.	The players collaborated as a team by ____.
<b>Why should the whole team play?</b>	The whole team should play the game because ____.	It is necessary for the whole team to play the game because ____.	It is necessary for the whole team to play the game because ____; otherwise ____.
<b>Function</b>	A special function of the ____ helps the whole team because ____.	Special functions like ____ and ____ help the team o work better as a whole.	Special functions included ____ for different players which helped ____.

4. Formatively assess the student groups to analyze the progress of the discussions. When the groups have covered all the discussion questions, pass out the poster paper.
5. Have students develop posters depicting their soccer or kickball game, writing captions that explain examples of working together and specialized functions. Students should use the checklist provided in the Student Edition.
6. Ask the groups to share out their posters. Instruct groups to show and explain their models and to respond to one another's models. Remind students to focus on communication, collaboration, and specialized function when presenting. Everyone in the groups should contribute to the presentation.



### LANGUAGE SUPPORT STRATEGIES

For groups with English Language Learners, have other groups with more proficient English speakers present their posters first, so they can see peer examples as models.

7. Remind students in the audience to think about communication, collaboration, and specialized function, and provide positive comments and constructive feedback when listening to the presentations.
  - Option: To limit discussion for each presentation (and time spent on presentations), elicit only one collaborative-communication-function question, one positive comment, and one constructive feedback comment for each presentation.

## Part III • Connect to the Culminating Project and Assessment

1. Introduce the Culminating Project. The goal of the Culminating Project is to provide an authentic outlet for students to explore the themes of communication, collaboration, and function. Students will apply these themes to a specific activity of their choice and design an Activity Brochure.
2. Have students independently complete the Lift-Off Task portion of the Individual Project Organizer as homework or in class, depending on students' needs and/or class scheduling.
3. Collect the Individual Project Organizers and assess them using these criteria:
  - The "Developing and Using Models" row of the Science and Engineering Practices Rubric
  - A criterion of your choice
4. Return the Individual Project Organizer and give students time to make revisions.



### LANGUAGE SUPPORT STRATEGIES

Clarify any terms on the rubric that ELLs are unfamiliar with.