

Pathways With Friends

Abstract

Directed by instructional cards, students kinesthetically model cell communication by acting as components in a cell signaling pathway.

Logistics

Time Required

▶ **Class Time:**
30 minutes

▶ **Prep Time:**
10 minutes

Materials

Classroom set of Cell Communication Cards (included), Overhead transparency and projector

Prior Knowledge Needed

None

Appropriate For:

Primary Intermediate Secondary College

Learning Objectives

- ▶ Cell communication is a multi-step process.
- ▶ Cells communicate via signaling pathways made of interacting components.
- ▶ Components of cell signaling pathways sometimes change shape as a result of their interaction (conformational change).

Pathways With Friends

Classroom Implementation

Activity instructions:

- Create a space in which students can move freely.
- Form groups of six students each. (You may have multiple groups in one class, or choose one group to demonstrate)
- Explain the rules of the activity:
 - » Each person will be given a card.
 - » Do not let others what know what your card says.
 - » When prompted, follow the instructions on the card to create a cell signaling pathway.
- Distribute one set of Cell Communication Cards to each group of six, and ask the students in each group to chose a card from their set.
- Once every student has a card, prompt the groups to begin by following instruction #1 on their card.
- Next, instruct your students to follow instruction #2 on their card.
- When each group is finished, show the whole class an overhead transparency of page 4, summarizing the cell signaling steps the students just demonstrated. Discuss the activity and how it models signaling pathways in the cell.

Discussion Points:

- What happened?
- How did you recognize where to go?
- How does this model cell communication?
- What effect did joining the pathway have on you? (Looking for something to indicate conformational change.)
- What problems did you encounter?
- What would have happened if someone didn't do their job (follow instructions) or weren't there?

Quantities

Per Group of 6

- ▶ One set of Cell Communication Cards (page 3)
- ▶ An overhead transparency (page 4) summarizing the steps of the cell signaling pathway.

Pathways With Friends

Standards

U.S. National Science Education Standards

Grades 9-12:

Life Science

- Content Standard C: Life Science - The Cell; Cells have particular structures that underlie their functions. Every cell is surrounded by a membrane that separates it from the outside world. Inside the cell is a concentrated mixture of thousands of different molecules which form a variety of specialized structures that carry out such cell functions as energy production, transport of molecules, waste disposal, synthesis of new molecules, and the storage of genetic material.

B. AAAS Benchmarks for Science Literacy:

Grades 9-12

The Living Environment

• Cells

- » Within every cell are specialized parts for the transport of materials, energy transfer, protein building, waste disposal, information feedback, and even movement. In addition, most cells in multicellular organisms perform some special functions that others do not.

Credits

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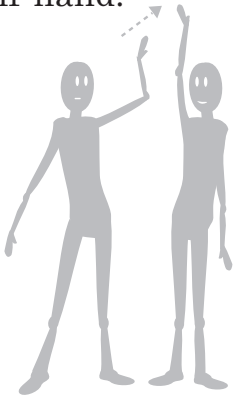
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Pathways With Friends

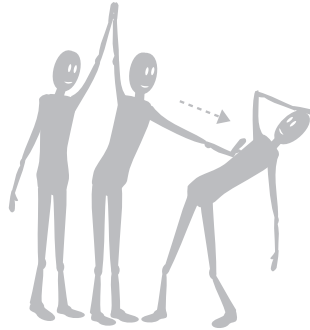
Pathways With Friends

1. Remain standing as you are.
2. Find someone with their hand in the air and grab their hand.



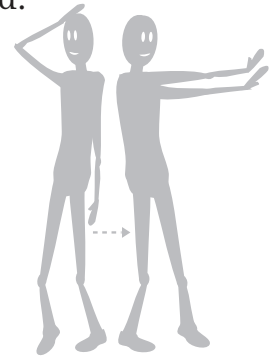
Pathways With Friends

1. Put your hand in the air until someone grabs your hand.
2. Find someone with their hands on their head and lean them back.



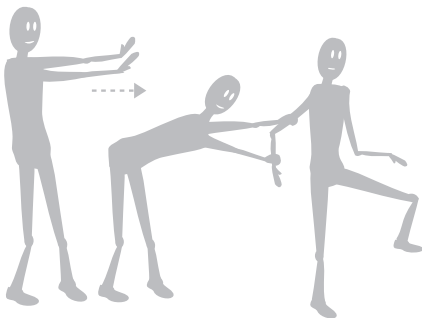
Pathways With Friends

1. Find the person with outstretched arms and stand back to back with them.
2. Put your hands on your head.



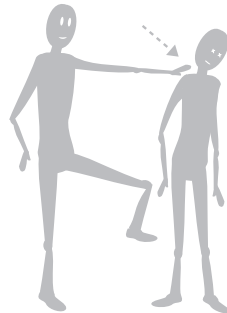
Pathways With Friends

1. Stretch your arms out in front of you.
2. Grab the person with their foot in the air when leaned forward.



Pathways With Friends

1. Put your foot up in the air.
2. When you get grabbed, touch the shoulder of the person with their eyes closed.



Pathways With Friends

1. Close your eyes and put your head down.
2. Run in place when touched on your shoulder.

