

Cells & Heredity: 6.C.2

Design a Cell Travel Brochure

Grade Level	6
Sessions	15-50 minutes
Seasonality	N/A
Instructional Mode(s)	Individual
Team Size	N/A
WPS Benchmarks	06.SC.LS.05 06.SC.LS.07
MA Frameworks	6-8.LS.3 6-8.LS.4 6-8.LS.16
Key Words	plant cell, animal cell, organelle

Summary

During this activity the students learn about cell organelles and their functions. The students will be asked to come up with a travel brochure for a plant or an animal cell highlighting the unique properties and functions of each organelle.

Learning Objectives

2002 Worcester Public Schools (WPS) Benchmarks for Grade 6

06.SC.LS.05 Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).

06.SC.LS.07 Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function is similar in all living organisms.

Additional Learning Objectives

1. **6-8.LS.16** Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.
2. Understand the function of each plant cell organelle.
3. Understand the function of each animal cell organelle.

4. Understand the difference between plant and animal cells.

Required Background Knowledge

1. Students should be exposed to the functions of the different organelles at least once (either in a reading assignment or in an introductory lecture).

Essential Questions

1. What is an organelle?
2. What is the function of each plant organelle?
3. What is the function of each animal cell organelle?

Introduction / Motivation

Pass out travel brochures for students to look out. Point out that they are brightly colored and describe the activities in a very fun and exciting way. Instead of using travel brochure examples, students can describe brochures that they have seen.

*** Prior to the beginning of this lesson, the instructor may wish to collect travel brochures to display in class.**

Procedure

The instructor will:

1. Ask the students to think about what they would write in a travel brochure if they were trying to advertise a vacation location.
2. Ask the student to give an example of how they would describe the cytoplasm within a cell.

Cytoplasm – the liquid that fills a cell.

Then, ask the students how they would describe it if they were trying to sell it or trying to get microbes to visit it.

Cytoplasm - – a rich, nutrient filled fluid that fills every part of the cell except for the nucleus.

3. Give the student more specific instructions for the homework assignment:

Design a travel brochure for either an animal cell or a plant cell with a certain number of organelles. They can use both sides of one piece of

paper. They must title the brochure and include all organelles listed in their science book. You may also want to encourage the students to record their brainstorming and research in their science notebook for an additional grade.

4. Assign the brochure as a homework assignment. It is up to the teacher's discretion whether or not to allow the students to work on the assignment in class.

Materials List

Materials per class	Amount	Location
Examples of travel brochures	Teacher discretion	AAA Office or Local Visitor's Bureau

Materials per student	Amount	Location
Paper	1	Office Supply Store, Department Store like Wal-mart
Drawing Utensils	Varies	Office Supply Store, Department Store like Wal-mart

Vocabulary with Definitions

1. *Organelle* – Structure within a cell that performs a specific function.
2. *Chloroplast* – Organelle in plant cells where photosynthesis occurs.
3. *Photosynthesis* – A process in green plants where sunlight, water, and nutrients are turned in to sugars that can be stored and then used as energy.
4. *Cell wall* – Organelle in plant cells that are the outermost layer. This organelle is thick and rigid. It gives plant cells an inflexible structure. It also keeps materials in the cell inside and keeps out unwanted things.
5. *Cell membrane* – Organelle in animal cells that is the barrier between the cell and the environment. It is a semipermeable membrane; it allows nutrients to enter and waste products to leave the cell.
6. *Semipermeable* - Partially permeable. Allowing passage of certain, especially small, molecules or ions but acting as a barrier to other things.

7. *Mitochondria* – Organelle in plant and animal cells that process sugar and oxygen to produce energy. The mitochondria is also referred to as the “power plant” of the cell.
8. *Vacuole* – Organelle in both plant and animal cells. Vacuoles are small compartments in cells that store food, water, and waste. Animal cells typically have many small vacuoles while plant cells generally have one large vacuole.
9. *Nucleus* – Organelle in both plant and animals cells that controls all activities in the cells. It stores chromosomes, which hold DNA. It also creates ribosomes, structures that grow off the nucleus and help generate proteins to be used in the rest of the cell.
10. *Ribosomes* – Small structures within both plant cells and animal cells that contains proteins and RNA. These structures act like a platform or template on which the cell's proteins are made.
11. *Endoplasmic Reticulum (ER)* – Organelle found in both plant and animal cells. It modifies proteins, creates macromolecules, and transports proteins. Proteins modified here are sent to the cell membrane in plant cells or sent to the central vacuole in the plant cells to be excreted.
12. *Golgi Bodies* – A complex organelle in both plant cells and animal cells that is considered to be the “post office” of the cell and also helps in the production of protein. It handles all incoming fat, protein, and other molecules and controls which molecules leave the cell. It works with the ribosomes and endoplasmic reticulum to make proteins for the cell.
13. *Centriole* – Organelle found in animal cells that is important to cell division.
14. *Cytoplasm* – A fluid within plant and animal cells, which surrounds all organelles.

Assessment / Evaluation of Students

The instructor may assess the students in any/all of the following manners:

1. Check the final project.
2. Check each student's science notebook for notes and brainstorming.

Lesson Extensions

The instructor may follow this lesson with a cell model activity or any other lesson in the Cells & Heredity Unit.

Attachments

None

Troubleshooting Tips

None

Safety Issues

None

Additional Resources

This lesson was adapted from a lesson developed by Mark Porter at Access Excellence at the National Health Museum in 1995

(http://www.accessexcellence.org/AE/AEC/AEF/1995/porter_cell.html).

Key Words

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