

# **Biology: Cells the Fundamental Unit of Life**

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Subject Area: Biology/ Human Anatomy and Physiology	Year: 2009-2010

## Overview

This series of lessons is meant to introduce students to the functions of a cell and the basic components of cells. It uses several instructional approaches that are meant to engage students in the process of understanding this complex and exciting material.

In order to understand the basic functions of human life, students need to understand how cells work, how basic cells function, and the role that parts of the cell play in its work. These basic cellular understandings will drive their ability to understand how specific cells in the human body are specialized to perform important specific functions. The basic premise of cellular organization is critical as a foundation step.

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## Overview

**Lesson:** Prokaryotic versus Eukaryotic Cells: Using Graphic Organizers to Understand Cells

**Subject/Grade Level:** Biology/ 9

**Lesson Time:** 60 minutes

### Lesson Synopsis

Students will work in groups around a graphic organizer and pictures/words from their text to understand the difference between prokaryotic and eukaryotic cells.

### Big Idea

### State Standards

Cells as the Fundamental Unit of Life	Standard 2.2 - Differentiate between prokaryotic cells and eukaryotic cells, in terms of their general structures and degrees of complexity
	Standard 2.3 - Distinguish between plant and animal cells.

### Learning Outcomes - Students will be able to:

- Identify and explain the basic components of a prokaryotic cell.
- Identify and explain the basic components of a eukaryotic cell.
- Differentiate between the two types of cells and identify areas of commonality and uniqueness among them.

### Key Cognitive Strategies

- Research
- Interpretation
- Analysis

### Materials Needed

Graphic organizers (see example below), chart paper and cell journals.

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Using Graphic Organizers to Understand Prokaryotic and Eukaryotic Cells

Biology textbook and/or website with pictures and text about the two cell types.
Overhead projector or chalkboard.
Wall space for the “Cell Question Wall” and sticky notes.

### Lesson Activities

<b>Step 1</b>	Students complete an opening assignment to assess what they already know about cells and the different types of cells that exist.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Writing to Learn	<p>Handout the cell journals and write the prompt on the board or on the overhead projector.</p> <p>In order for students to confront new knowledge it is important to activate prior knowledge and use this as a starting point.</p>	Have students respond to the prompt: “What are cells? What makes cells important, and are all cells the same?”	5 Min

<b>Step 2</b>	Students work in groups of three to fill in the graphic organizer (example below).		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	Assign students to groups of three. Give students the graphic organizer (example below) and the assignment. The graphic organizer should consist of two large circles that intersect. Have students use one area to write down all of the characteristics that are specific to only prokaryotic cells. Have students use the other area area to write down all the characteristics that are found	<p>Have students use their textbook or the Internet to compare and contrast these prokaryotic and eukaryotic cells.</p> <p>Have them complete the graphic organizer.</p>	25 Min

	<p>only in eukaryotic cells. In the overlapping section, have students write all of the characteristics that are shared by both prokaryotic and eukaryotic cells.</p> <p>Circulate between the groups to clear up questions of confusions.</p>		
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<b>Step 3</b>	After all groups have finished and each student has his or her graphic organizer, students pair with a partner from another group. Have the pairs compare their graphic organizers and reconcile any differences.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	<p>Group the students into pairs. Monitor pairing process and make sure each student has a graphic organizer. After the pairs have finished comparing their graphic organizers, put the teacher's graphic organizer on the overhead and make sure all students have the right information in the parts of the organizer.</p> <p>Introduce the cell question wall. Here, student can put questions on sticky notes and attach them to the wall. If during their discussions, questions arise, this would be the place for them.</p>	<p>Have students compare graphic organizers and reconcile any differences between them. Students should then compare their final versions to the teacher version and make modifications if necessary.</p>	13 Min

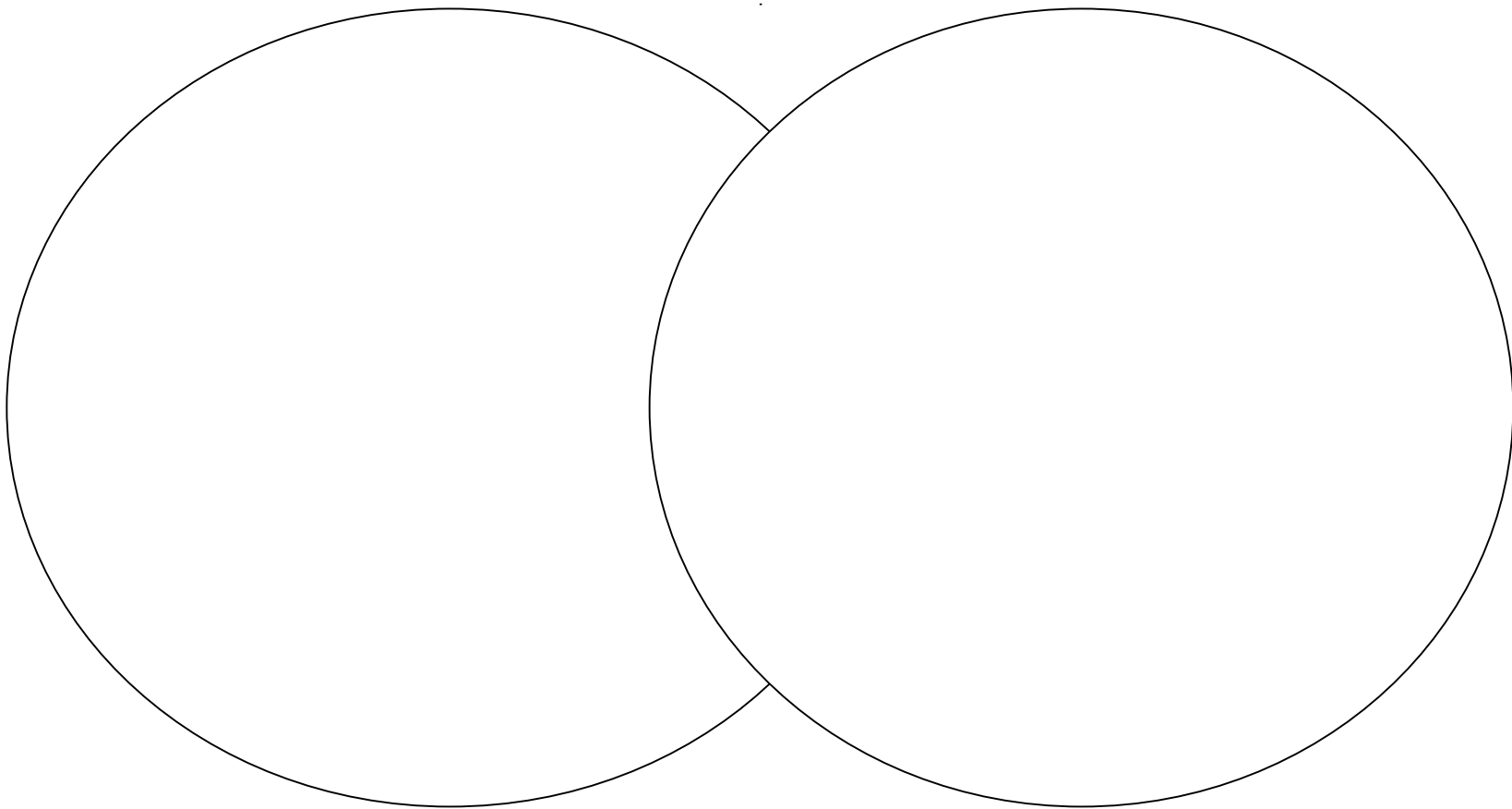
<b>Step 4</b>	Introduce the Cell Question Wall and answer questions.		
<b>Instructional</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time</b>

<b>Strategy</b>			<b>(min)</b>
Collaborative Group Work Questioning Strategies	Set aside wall space where students can put questions on sticky notes and attach them to the wall.  Answer questions that are on the question wall.	If students have questions during their discussions, have them post the questions on the Cell Question Wall with sticky notes.  Students who posted questions can pose them to the class and the teacher.	2 Min

<b>Lesson Closing</b>	Give students a writing assignment to prompt their thinking for the next day.		
<b>Instructional Strategy</b>	<b>Closing Teacher Activity</b>	<b>Closing Student Activity</b>	<b>Time (min)</b>
Writing to Learn	Provide the closing writing prompt and have students enter it in their cell journals.  They are required to start it in this lesson, but will need to turn it in during the next lesson.	Have the students respond to the following prompt: “Write a letter to a student in next year’s 9 <sup>th</sup> grade. Describe the similarities and differences between prokaryotic and eukaryotic cells and why it is important to know the difference.”	15 Min

### **Assessments of Learning Outcomes**

<ul style="list-style-type: none"> <li>• Graphic Organizer</li> <li>• Writing Prompts</li> </ul>
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Using Graphic Organizers to Understand Prokaryotic and Eukaryotic Cells

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## Overview

**Lesson:** The Cell Membrane: Using Collaborative Group Work to Understand the Form and Function of the Cell Membrane

**Subject/Grade Level:** Biology/ 9 **Lesson Time:** 60 minutes

### Lesson Synopsis

Students will work in groups to identify the form and function of the cell membrane.

### Big Idea

### State Standards

Cells as the Fundamental Unit of Life	Standard 2.1 - Relate cell parts/organelles to their functions.
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### Learning Outcomes - Students will be able to:

- Identify the components of the cell membrane.
- Explain the role of the cell membrane.
- Explain the role that each part of the membrane plays in performing its function.

### Key Cognitive Strategies

- Research
- Interpretation
- Analysis
- Evaluation

### Materials Needed

Chart paper.  
Biology textbook and/or website with a picture of a typical cell membrane.  
Sticky notes.

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The Cell Membrane: Using Collaborative Group Work to Understand the Form and Function of the Cell Membrane

Students cell journals (notebooks).

### Lesson Activities

<b>Step 1</b>	Collecting homework from the previous lesson, place students in groups of three and tell them that we are going to begin looking at a typical eukaryotic cell.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work Classroom Talk	Answer questions and lead discussion.	Have students refer to their graphic organizers to identify the characteristics of a eukaryotic cell.	5 Min

<b>Step 2</b>	Give each group two large pieces of chart paper and begin discussion of cell membranes.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	<p>Provide the students with the page numbers in their textbook and or website pages that deal with the cell membrane.</p> <p>Make sure students don't spend lots of time making their pictures look pretty. Remind them that the point of the exercise is to know each of the parts of the cell membrane and why they are important.</p> <p>The connection between the two pieces of chart paper is critical.</p>	<p>On one piece of chart paper, have each group of students identify the key concepts and key vocabulary terms that deal with the cell membrane. Have students explain why a certain form or structure of the cell membrane is important to its function.</p> <p>On the other piece of chart paper, have students draw their own picture of a cell membrane and clearly identify and label each of the key concepts and vocabulary terms from the first piece of chart paper.</p>	20 Min

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The Cell Membrane: Using Collaborative Group Work to Understand the Form and Function of the Cell Membrane



<b>Step 3</b>	Once students have completed and connected their two large chart papers, have students post them in the classroom and carrousel around the class to see each group's work.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Classroom Talk	Allow students the time to post the chart paper, and walk around to see the others. Give each group gets a handful of sticky notes. Keep the time brief, you just want them to see the other groups' work, just in case they forgot something on their cell or want to add a piece to another group's cell.	Have each group go around and see the other groups' work. Have students leave comments, questions, or wonder statements at the various stations with sticky notes.	10 Min

<b>Step 4</b>	After the allotted time has expired, tell groups to look at the comments that were left on their charts, and allow them to make modifications or adaptations to their cell membranes.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Questioning Strategies	Give groups time to modify their cell membrane pictures and vocabulary.	Have students read and respond to the sticky notes left by their classmates and make necessary modifications.	5 min

<b>Lesson Closing</b>	Have students work together to make a metaphor to understand the role, function, and form of the cell membrane.		
<b>Instructional Strategy</b>	<b>Closing Teacher Activity</b>	<b>Closing Student Activity</b>	<b>Time (min)</b>
Writing to Learn Collaborative Group Work	Give students an example of a metaphor for the function of the cell membrane. For example, explain that the walls of the classroom could be considered a cell membrane, and the doors and windows	Give students time to work together to create a metaphor to explain the form and function of the cell membrane. Have each group write this metaphor down in their cell journals and clearly connect each of the	20 min

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The Cell Membrane: Using Collaborative Group Work to Understand the Form and Function of the Cell Membrane

	<p>function as parts of the membrane that allow some things in and other things not. Explain how each aspect they identified in their picture would have to have a part in the metaphor.</p> <p>For ninth graders it will be necessary to scaffold this, and explain what a metaphor is and give an example. The importance of this process is to help students internalize the various components of the cell membrane and how they work</p>	<p>concepts and vocabulary to the metaphor.</p>	
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**Assessments of Learning Outcomes**

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| <ul style="list-style-type: none"> <li>• Posters</li> <li>• Metaphor Journal Entry</li> </ul> |
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## Overview

**Lesson:** The Nucleus: Using Writing to Learn and Questioning to Make Connections

**Subject/Grade Level:** Biology/ 9

**Lesson Time:** 60 minutes

### Lesson Synopsis

Students will work as teams to connect the concepts of the cell nucleus using a word web.

### Big Idea

### State Standards

Cells as the Fundamental Unit of Life

Standard 2.1 - Relate cell parts/organelles to their functions.

### Learning Outcomes - Students will be able to:

- Identify the components of the nucleus.
- Explain the parts of the nucleus and why they are important.
- Explain the function of the cell nucleus.

### Key Cognitive Strategies

- Research
- Interpretation
- Analysis
- Evaluation

### Materials Needed

Chart paper for the word web.

Biology textbook and/or website about the cell nucleus.

Chalkboard or overhead projector.

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The Nucleus: Using Writing to Learn and Questioning to Make Connections

Students cell journals (notebooks).
A list of key concept questions

### Lesson Activities

<b>Step 1</b>	Place students in pairs and ask them to copy the important nucleus concepts into their cell journals.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	Write the key words for the cell nucleus on the chalkboard or overhead projector: Nuclear Envelope, Nuclear pores, genes, DNA, RNA, Nucleolus, Nucleoplasm	Have students write down the following words/concepts for the cell nucleus: Nuclear Envelope, Nuclear pores, genes, DNA, RNA, Nucleolus, Nucleoplasm	10 Min

<b>Step 2</b>	Have each pair connect the key words and concepts using an annotated word web.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work Writing to Learn	Make sure students understand that the definitions in the word web are theirs and that they understand them. Also, make sure the students can explain how the words are conceptually linked in the web.	Have students work together to create the word web. Have students explain how the terms are linked together. The students' word webs should connect the vocabulary words and also include a brief definition of each word.  Encourage students to use symbols, art, and words to understand what the nucleus does and how it functions.  When each pair completes their word web, have them document in their cell journals the answers to the key concept questions.	30 Min

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The Nucleus: Using Writing to Learn and Questioning to Make Connections

<b>Lesson Closing</b>	Have each pair present their word web to another group to explain their thinking about how the words are connected.		
<b>Instructional Strategy</b>	<b>Closing Teacher Activity</b>	<b>Closing Student Activity</b>	<b>Time (min)</b>
Classroom Talk	Assign each pair of students to another pair. Have the pairs explain the word web they created. Be sure that students understand that they must explain how they linked the concepts and words,	Have each pair present their word web to another pair. After each pair has presented, have students answer the following key questions in their cell journals: <ol style="list-style-type: none"> <li>1. How does the cell nucleus perform its job?</li> <li>2. How do we connect this with what we have already learned about the cell?</li> <li>3. What questions are still lingering about the cell nucleus?</li> <li>4. What were similarities and differences between your word web and the other group's word web? What do you make of this?</li> </ol>	20 min

**Assessments of Learning Outcomes**

<ul style="list-style-type: none"> <li>• Word Webs</li> <li>• Journal Entries</li> </ul>
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## Overview

**Lesson:** Cell Organelles: Using group work to created Organelle Wanted Posters

**Subject/Grade Level:** Biology/ 9

**Lesson Time:** 60 minutes

### Lesson Synopsis

Students will work in teams to create “Cell Organelle Wanted” Posters

### Big Idea

### State Standards

Cells as the Fundamental  
Unit of Life

Standard 2.1 - Relate cell parts/organelles to their functions.

### Learning Outcomes - Students will be able to:

- Identify the organelles of cells.
- Explain the role that each organelle plays in the cell.
- Explain the how these organelles connect to others and the work of the cell.

### Key Cognitive Strategies

- Research
- Interpretation
- Analysis
- Evaluation

### Materials Needed

Construction paper, markers for “Cell Organelle Wanted” posters.

Biology textbook and/or website about the cell.

Students’ cell journals (notebooks).

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Cell Organelle Wanted Posters #1

## Lesson Activities

<b>Step 1</b>	Place students in teams of five and have each team complete a “Cell Organelle Wanted” poster for their assigned organelle.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	Assign each team one of the organelles to describe and have them create a “Wanted” poster for that organelle.	Assign each group one of the following organelles: <ul style="list-style-type: none"> <li>- Rough ER</li> <li>- Smooth ER</li> <li>- Golgi Apparatus</li> <li>- Lysosomes</li> </ul> Have them create a “Wanted” poster with a description of what the organelle looks like, what it does, and how it connects to the rest of the cell using information from textbooks or websites about cells.	30 Min
<b>Step 2</b>	When the wanted posters are completed, have the groups hang their wanted posters around the classroom. Have the teams rotate to see all of the organelles presented. As students go to each poster, have them complete a note sheet in their cell journals.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Questioning Strategies	Make sure students know that they are responsible for collecting all of the information on all of the organelles.	Have students use the following format to take notes on the organelles of other groups in their cell journals: <ul style="list-style-type: none"> <li>• What does this organelle look like?</li> <li>• What does it do?</li> <li>• How does it connect to the rest of the cell? The cell membrane, the cell nucleus?</li> <li>• What is confusing? What are your questions?</li> </ul>	20 Min

<b>Lesson Closing</b>	Have students share questions or confusions with the class. Assign students homework of researching their questions or confusions.		
<b>Instructional Strategy</b>	<b>Closing Teacher Activity</b>	<b>Closing Student Activity</b>	<b>Time (min)</b>
Classroom Talk Questioning Strategies	Have students share confusions or questions.	Each student will share a question or confusion. Have students research the question or confusion they have shared for homework and record their answers in their cell journals.  The next class will begin with confronting these questions.	10 Min

**Assessments of Learning Outcomes**

<ul style="list-style-type: none"> <li>• Wanted Posters</li> <li>• Journal Notes</li> </ul>
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## Overview

**Lesson:** The Cell Organelles Lesson #2: Using Collaborative Group Work and Student Talk to Understand the Role of Certain Organelles

**Subject/Grade Level:** Biology/ 9      **Lesson Time:** 60 minutes

### Lesson Synopsis

Students will work in teams to create “Cell Organelle Wanted” Posters.

### Big Idea

### State Standards

Cells as the Fundamental Unit of Life	Standard 2.1 - Relate cell parts/organelles to their functions.
	Standard 2.5 - Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport).

### Learning Outcomes - Students will be able to:

- Identify the organelles of cells.
- Explain the role that each organelle plays in the cell.
- Explain the how these organelles connect to others and the work of the cell.

### Key Cognitive Strategies

- Research
- Interpretation
- Analysis
- Evaluation

### Materials Needed

Construction paper, markers for “Cell Organelle Wanted” posters.

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Cell Organelle Wanted Posters #2

Biology textbook and/or website about the cell.
Students' cell journals (notebooks).

### Lesson Activities

<b>Step 1</b>	Have students share their findings from their research questions generated from the previous lesson.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Classroom Talk	Have students share the answers to the questions that were generated in the previous class. Make sure each student is documenting the answers to these questions in their cell journals.	Have students share questions and answers, and take notes in their cell journals.	10 Min

<b>Step 2</b>	Place students in teams of five and have each team complete a “Cell Organelle Wanted” poster for their assigned organelle.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	Assign each team one of the organelles to describe and have them create a “Wanted” poster for that organelle.  If necessary, more than one group can get the same organelle.	Assign each group one of the following organelles: <ul style="list-style-type: none"> <li>- Vacules</li> <li>- Peroxisomes</li> <li>- Mitochondria</li> </ul> Have them create a “Wanted” poster with a description of what the organelle looks like, what it does, and how it connects to the rest of the cell using information from textbooks or websites about cells.	30 Min

<b>Step 3</b>	When the wanted posters are completed, have the groups hang their wanted posters around the classroom.
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	Have the teams rotate to see all of the organelles presented. As students go to each poster, have them complete a note sheet in their cell journals.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Questioning Strategies	Make sure students know that they are responsible for collecting all of the information on all of the organelles.	<p>Have students use the following format to take notes on the organelles of other groups in their cell journals:</p> <ul style="list-style-type: none"> <li>• What does this organelle look like?</li> <li>• What does it do?</li> <li>• How does it connect to the rest of the cell? The cell membrane, the cell nucleus?</li> <li>• What is confusing? What are your questions?</li> </ul>	15 Min

<b>Lesson Closing</b>	Have students share questions or confusions with the class. Assign students homework of researching their questions or confusions.		
<b>Instructional Strategy</b>	<b>Closing Teacher Activity</b>	<b>Closing Student Activity</b>	<b>Time (min)</b>
Classroom Talk Questioning Strategies	Have students share confusions or questions.	<p>Each student will share a question or confusion. Have students research the question or confusion they have shared for homework and record their answers in their cell journals.</p> <p>The next class will begin with confronting these questions.</p>	5 Min

**Assessments of Learning Outcomes**

<ul style="list-style-type: none"> <li>• Wanted Posters</li> <li>• Journal Notes</li> </ul>
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## Overview

**Lesson:** The Cytoskeleton: Collaborative Group Work and the Structure of the Cell

**Subject/Grade Level:** Biology/ 9

**Lesson Time:** 60 minutes

### Lesson Synopsis

Students will work in teams to create representations of the cytoskeletal structures.

### Big Idea

### State Standards

Cells as the Fundamental Unit of Life

Standard 2.1 - Relate cell parts/organelles to their functions.

### Learning Outcomes - Students will be able to:

- Identify the components of the cytoskeleton.
- Explain the role that each structure plays.

### Key Cognitive Strategies

- Research
- Interpretation
- Evaluation

### Materials Needed

Construction paper, markers, tape, pipe cleaners, paper towel rolls, rolls of various sizes, straws of various sizes, and scissors.

Biology textbook and/or website about the cell.

Students' cell journals (notebooks).

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The Cytoskeleton: Collaborative Group Work and the Structure of the Cell

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## Lesson Activities

<b>Step 1</b>	Have students share their findings from the research questions generated from the previous lesson.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Classroom Talk	Make sure each student is documenting the answers to these questions in their cell journals.	Have students share questions and answers, and take notes in their cell journals.	10 Min

<b>Step 2</b>	Place students in teams of five and have each team create the various structures that make up the cytoskeleton.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	Explain that each group must construct the various structures that create the cytoskeleton given the materials available.	<p>Have each group use the materials provided to create the cell's cytoskeleton.</p> <p>Have the students create and define each of the structures and clearly mark where each structure can be found.</p> <p>The structures are:</p> <ul style="list-style-type: none"> <li>- Microtubules</li> <li>- Microfilaments</li> <li>- Centrioles</li> <li>- Cilia</li> <li>- Flagella</li> </ul>	35 Min

<b>Lesson Closing</b>	Hang up structures and have each group view the work of the other groups.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>

Questioning Strategies	Have students hang up their structures.	Students should walk around the classroom to see the other groups' work Have each student create at least one question or observation about the structures of the other groups.	15 Min
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**Assessments of Learning Outcomes**

<ul style="list-style-type: none"> <li>• Cell Cytoskeletal Structures</li> <li>• Student Questions</li> </ul>
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## Overview

**Lesson:** The Cell Fashion Show: Using Collaborative Group Work and Student Presentations to Assess Understanding of the Cell

**Subject/Grade Level:** Biology/ 9

**Lesson Time:** 60 minutes

### Lesson Synopsis

Students will create a cell fashion show or skit to demonstrate their knowledge about the cell.

### Big Idea

### State Standards

Cells as the Fundamental Unit of Life	Standard 2.2 - Differentiate between prokaryotic cells and eukaryotic cells, in terms of their general structures and degrees of complexity.
	Standard 2.1 - Relate cell parts/organelles to their functions.
	Standard 2.5 - Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport).

### Learning Outcomes - Students will be able to:

- Identify the key learning points for the cell.
- Apply their knowledge about the cell.

### Key Cognitive Strategies

- Research
- Interpretation
- Evaluation

### Materials Needed

Previous work on the cells and cell journals.

Biology textbook and/or website about the cell.

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The Cell Fashion Show: Using Collaborative Group Work and Student Presentations to Assess Understanding of the Cell

### Lesson Activities

<b>Step 1</b>	Place students in teams of five to create a fashion show or skit to review material cover so far in this unit.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work	Place students in teams of five. Instruct students that their fashion shows or skits must cover all of the major topics and demonstrate mastery of this material.	Have each group create a skit or performance. Students can use acting, art, music, or other means to explain the material they have learned so far.  Have the students demonstrate their mastery of the following topics: <ul style="list-style-type: none"> <li>- Cell membrane</li> <li>- Cell nucleus</li> <li>- Cell Organelles</li> <li>- Ctyoskeleton</li> </ul>	35 Min
<b>Step 2</b>	Each team presents a show or skit and the other students evaluate them.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Classroom Talk Collaborative Group Work	Give instructions on presenting and rubric to evaluate skits.	Have each team present their skit. Have each student complete a rubric to evaluate the other groups' presentations.  Rubrics categories are: <ul style="list-style-type: none"> <li>- Performance</li> <li>- Content</li> <li>- Connections</li> <li>- Creativity</li> </ul> Have students evaluate each category on a 1-10 point scale.	25 Min

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The Cell Fashion Show: Using Collaborative Group Work and Student Presentations to Assess Understanding of the Cell



### **Assessments of Learning Outcomes**

- Cell Skits
- Student Evaluations

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The Cell Fashion Show: Using Collaborative Group Work and Student Presentations to Assess Understanding of the Cell

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## Overview

Lesson:

Final Assessment: Student-created Exam and Rubric

Subject/Grade Level:

Biology/ 9

Lesson Time:

60 minutes

### Lesson Synopsis

Students will create a final unit assessment and rubric for this cell unit.

### Big Idea

### State Standards

Cells as the Fundamental Unit of Life	Standard 2.2 - Differentiate between prokaryotic cells and eukaryotic cells, in terms of their general structures and degrees of complexity.
	Standard 2.3 - Distinguish between plant and animal cells.
	Standard 2.1 - Relate cell parts/organelles to their functions.
	Standard 2.5 - Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport).

### Learning Outcomes - Students will be able to:

- Identify the key learning points for the cell.
- Create a rubric for the learning points of the unit.

### Key Cognitive Strategies

- Research
- Interpretation
- Evaluation
- Analysis

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Final Assessment: Student-created Exam and Rubric

### Materials Needed

Previous work on the cells and cell journals.
Biology textbook and/or website about the cell.
Index cards

### Lesson Activities

<b>Step 1</b>	Assign students to teams of five to create both an assessment to assess their knowledge now that the unit is over. Have students administer their assessments to others in the class.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Collaborative Group Work Writing to Learn	Place students in teams of five and give instructions for creating an assessment. The assessment can be in short answer or essay form.	Have students create questions that ensure mastery of the most important concepts of the unit. They can use their cell journals and all the materials completed thus far to create their assessment.	30 Min

<b>Step 2</b>	Have students create a rubric for the assessment they created. The rubric should clearly determine what an acceptable answer looks like for each question.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Questioning Strategies	Give instructions for creating a rubric. Remind students that each question in the assessment should have a rubric that indicates clear and measurable components.	Have students create a rubric for each question that has clear indicators for an acceptable answer.	25 Min

<b>Lesson Closing</b>	Have each group draw index cards to see which other group's assessment they will take. No group should be allowed to get its own assessment.		
<b>Instructional Strategy</b>	<b>Teacher Activity</b>	<b>Student Activity</b>	<b>Time (min)</b>
Questioning Strategies	<p>Write each group's name on an index card and distribute to groups.</p> <p>Hand out the assessments and have students complete them for homework.</p> <p>Explain that the assessment is due in the next class.</p>	Assign each group an assessment and have each student in the group complete the assessment for homework.	5 Min

### Assessments of Learning Outcomes

<ul style="list-style-type: none"> <li>• Final Assessments</li> <li>• Rubrics</li> </ul>
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