

**Animal and Plant Cells • Relationships/Parts of a Whole/Comparison**



**Unit Essential Question**

How can analyzing the relationships of cell organelles help us to understand living things?

**UNIT DESCRIPTION**

Students will use theatre, music, movement and the visual arts to explore plant and animal cells. The unit's projects will lead students to making discoveries about the different cells they examine and the inner relationships of the organelles. Students will also strengthen their informational and opinion writing skills through the unit projects.

**PROJECTS**

(2-4 Weeks)

- Do You See What I See?
- Music and Movement in the Plant Cell
- Using Tableau to Become a Plant Cell
- Cell Rap
- Cell Debate
- 3D Cell Models

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Units provide differentiated ideas and activities aligned to a sampling of standards.

The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program  
Cherokee County (GA) School District and ArtsNow, Inc.

## UNIT OVERVIEW

Unit Description	Table of Contents
Students will use theatre, music, movement and the visual arts to explore plant and animal cells. The unit's projects will lead students to making discoveries about the different cells they examine and the inner relationships of the organelles. Students will also strengthen their informational and opinion writing skills through the projects in this <b>Cells Celebrate!</b> Unit.	Project 1: Do You See What I See? Project 2: Music & Movement in the Plant Cell Project 3: Using Tableau to Become a Plant Cell Project 4: Cell Rap Project 5: Cell Debate Project 6: 3D Cell Models

## UNIT ESSENTIAL QUESTION

How can analyzing the relationships of cell organelles help us to understand living things?

## CROSS-CUTTING INTERDISCIPLINARY CONCEPT

Relationships  
Comparison (Compare and Contrast)  
Parts of a Whole

## REAL WORLD CONTEXT

We study and analyze cells because they are the basis for life. We are all made up of cells and it is important that we understand the function of all of the organelles present in cells so we know how cells work. Scientists and doctors study cells to understand things like cancer and diseases. They work to detect when a cell looks abnormal and what may have caused it to be abnormal. Understanding the foundational knowledge of a cell leads us to understanding the inner workings of biology.

## STANDARDS

Curriculum Standards	Arts Standards
<p><b>S5P1.</b> Students will verify that an object is the sum of its parts b. Investigate how common items have parts that are too small to be seen without magnification</p> <p><b>S5L3.</b> Students will diagram and label parts of various cells a. Use magnifiers such as microscopes or hand lenses to observe cells and their structure b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus) and determine the function of the parts</p> <p><b>ELAGSE5W1.</b> Write opinion pieces on topics or texts, supporting a point of view with reasons</p>	<p><b>VA5PR.1</b> Creates artworks based on personal experience and selected themes</p> <p><b>VA5PR.1.e</b> Creates artworks from direct observation</p> <p><b>VA5PR.2.</b> a. creates artworks with a variety of media b. draws images from careful observation</p> <p><b>VA5PR.3</b> Understands and applies media, techniques, and processes of 3 dimensional works of art using tools and materials in a safe and appropriate manner to develop skills</p> <p><b>VA5PR.4</b> Plans and participates in appropriate exhibitions of artworks.</p>

<p>a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose</p> <p>b. Provide logically ordered reasons that are supported by facts and details</p> <p>c. Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically)</p> <p>d. Provide a concluding statement or section related to the opinion presented</p> <p><b>ELAGSE5W2.</b> Write informative/explanatory texts to examine a topic and convey ideas and information clearly</p> <p>b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic</p> <p>d. Use precise language and domain-specific vocabulary to inform about or explain the topic</p>	<p><b>D5FD.4</b> Understands and applies music concepts to dance</p> <p>b. Exhibits and creates variety in movement qualities in response to a variety of musical selections and instruments</p> <p>c. Demonstrates musicality while performing dance phrases</p> <p><b>D5CO.4:</b> Demonstrates an understanding of dance as it relates to other areas of knowledge</p> <p><b>TAES5.2</b> Developing scripts through improvisation and other theatrical methods</p> <p><b>TAES5.3</b> Acting by developing, communicating, and sustaining roles within a variety of situations and environments</p> <p><b>TAES5.7</b> Integrating various art forms, other content areas, and life experiences, to create theatre</p> <p><b>M5GM.1</b> Singing, alone and with others, a varied repertoire of music</p> <p><b>M5GM.4</b> Improvising melodies, variations, and accompaniments</p> <p><b>M5GM.5</b> Composing and arranging music within specified guidelines</p> <p><b>M5GM.8</b> Understanding relationships between music, the other arts, and disciplines outside the arts</p>
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## ASSESSMENTS

Summative Assessments
<ul style="list-style-type: none"> <li>• <b>Written Reflections</b> (for each project)</li> <li>• <b>Field of View Handout</b> Students are directed to select one of the one of the images they saw with the microscope and create a field of view drawing representing what they observed after viewing various cells.</li> <li>• <b>Cell Function riddle-</b> Students create and display their own riddle to be shared with the class</li> <li>• <b>Informational Writing Piece:</b> Students will write a monologue from the viewpoint of their cell organelle "character". <b>Informational Cell Monologue Rubric</b> is used to assess writing</li> </ul>



- **Cell Rap Rubric-** Completion and performance of musical rap
- **Word Art-** students create word art that takes the science vocabulary and through design, illustrates the word meaning
- **Student Debate Self-Assessment:**  
Students will rate themselves on their recorded video debate after it is watched after the debate
- Create different **monologues** for organelles in both plant and animal cells
- **3D Cell Model Self-Assessment Checklist-** Completion of a model of a cell with organelles correctly labeled

### PARTNERING WITH FINE ARTS TEACHERS

#### Music Specialist:

- Additional support in Project 4: Cell Rap
- Assist in incorporating music note counts with specific movements for various cell organelles

#### Visual Arts Specialist:

- Additional support in Project 1: Do You See What I See
  - Assist with visual arts project magnifying cells in the form of mixed media.
  - Assist with providing ideas for media
- Additional support in Project 6: 3-D Cell Models
  - Assist with providing ideas for materials and differentiation in 3-D cell model presentation

### CHARACTER EDUCATION COMPONENTS

In this unit there are many opportunities for the class to share an arts integrated project for another 5th grade class audience. Particularly the 3D Cell Model and the Cell Debate projects. The 3D Cell Models could be set out with the students serving as tour guides. Another class could visit each exhibit and ask questions to the “cell experts”. The Cell Debate could easily be a performance where another class could video record and analyze the presentation. Character Education is truly integrated when opportunities are created for students to teach other students. Also character education opportunities are created when students step into the role not only as performers but also as audience/ critics who analyze closely what they see to provide peer feedback.

### CHARACTER ATTRIBUTES (addressed in unit)

#### Respect

- For one another
- For the environment

#### Parts of a Whole

- Cooperate/ Working in groups
- Compromise/ Negotiation skills
- Interdependence

### APPENDIX

- PreTest



**ADDITIONAL RESOURCES**

Books

- Powerful Plants Cells by Rebecca L. Johnson
- Cells Up Close by Maria Nelson
- Photosynthesis by Christine Zuchora-Walske

Website

- [“Arts Edge: “What’s Inside a Cell?”](#)
- [http://www.cellsalive.com/cells/cell\\_model.htm](http://www.cellsalive.com/cells/cell_model.htm)

**CREDITS**

U.S. Department of Education

Arts in Education--Model Development and Dissemination Grants Program

Cherokee County (GA) School District and ArtsNow, Inc.

Ideas contributed and edited by: Taylor Stewart, Danny Arnett, Jessica Espinoza, Richard Benjamin Ph.D., Michele McClelland

## Project 1: Do You See What I See?

Animal and Plant Cells • Relationships/  
Parts of a Whole/Comparison



### Project Essential Questions

- How does the concept “Parts of a Whole” relate to understanding organisms?
- What does it mean to magnify?
- What do we see when we take a closer look?

#### PROJECT DESCRIPTION

The purpose of this project is to introduce students to the tools used to observe cells. Students will investigate the appearance of various cells using a microscope. Students will explore how the parts of a small organism work together and compose the parts of a whole. This lesson suggests also collaborating with the art teacher to take a closer look at students’ microscope sketchings and creating a large work of art that amplifies the organelles that make up a cell.

#### LEARNING TARGETS

“I Can...”

- Use a microscope or hand lens to verify that organisms are made up of cells
- Interpret what I see in the microscope by sketching

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**DURATION: 2 Days**

Project Description	Learning Targets
The purpose of this project is to introduce students to the tools used to observe cells. Students will investigate the appearance of various cells using a microscope. Students will explore how the parts of a small organism work together and compose the parts of a whole. This lesson suggests also collaborating with the art teacher to take a closer look at students' microscope sketchings and creating a large work of art that amplifies the organelles that make up a cell.	<p>“I Can...”</p> <ul style="list-style-type: none"><li>• Use a microscope or hand lens to verify that organisms are made up of cells</li><li>• Interpret what I see in the microscope by sketching</li></ul>

**ESSENTIAL QUESTIONS**

<ul style="list-style-type: none"><li>• How does the concept “Parts of a Whole” relate to understanding organisms?</li><li>• What does it mean to magnify?</li><li>• What do we see when we take a closer look?</li></ul>
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**STANDARDS**

Curriculum Standards	Arts Standards
<p><b>S5P1. Students will verify that an object is the sum of its parts.</b> b. Investigate how common items have parts that are too small to be seen without magnification</p> <p><b>S5L3. Students will diagram and label parts of various cells.</b> a. Use magnifiers such as microscopes or hand lenses to observe cells and their structure. b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus) and determine the function of the parts</p>	<p><b>VA5PR.1.e</b> Creates artworks from direct observation</p> <p><b>VA5PR.2.</b> a. Creates artworks with a variety of media b. Draws images from careful observation</p>



### KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"><li>• Plant</li><li>• Animal</li><li>• Single-celled</li><li>• Multi-celled</li><li>• Membrane</li><li>• Wall</li><li>• Cytoplasm</li><li>• Nucleus</li><li>• Chloroplasts</li><li>• Microscope</li><li>• Magnifier</li></ul>	<ul style="list-style-type: none"><li>• Media</li><li>• Balance</li><li>• Emphasis</li><li>• Perspective</li></ul>

### TECHNOLOGY INTEGRATION

Computer, internet, projector, microscopes, viewers, and prepared slides of various cells: plant and animal parts

### ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"><li>• Student sketches created after rotating through the microscope stations and observing the various slides of different cells</li><li>• Teacher-led questioning throughout the station rotation</li></ul>	<ul style="list-style-type: none"><li>• <b>Field of View Handout</b> (see Downloads) Students are to select one of the images they saw with the microscope and create a field of view drawing representing what they observed after viewing various cells.</li><li>• <b>Written Reflection</b> (see Downloads)</li></ul>

### MATERIALS

Microscopes, slide viewers, prepared slides of various cells, drawing paper with circular “Field of View,” colored pencils, crayons  
\*Various types of cell slides can be purchased at: [www.carolina.com](http://www.carolina.com), keyword “cell slides”

### Activating Strategy (5-10 min)

Project a picture of the painting of a cancer cell on the whiteboard:

**Cancer Cell Image:** <http://mcc.jhu.edu/news/couple-sees-beauty-in-cancer-painting>

#### **Questions used to explore the cell image:**

- What media is used in the painting?
- How is the artist able to create perspective?
- What does the artist emphasize?
- What kind of balance is apparent in the painting (symmetrical, asymmetrical, radial)?
- Class will discuss the visual aspects of cell organelles, such as cell wall, cell membrane, nucleus, chloroplasts, shape, and relative size.

### Main Activity

#### **Part 1:**

- Teacher will model how to use the microscope with various slides. The teacher will review the parts of a microscope and proper ways to use it, by showing how to adjust focus, place slides on the stage, and adjust slides.
- Students rotate through 5 centers viewing slides of various cells or organism parts. Students will make a rough draft of the image seen including size, organelles, and hypothesize what type of cell they see in each.
- Students will then choose one of the cells they viewed and create a detailed drawing of what they saw in their microscope field of view.

#### **Part 2:**

- Teacher will collaborate with the visual arts teacher to direct students to use their cell drawings in groups to collaboratively create a large painting representation of the cell and all of its parts.

*Materials: Circular pieces of canvas or thick paper, mixed media (suggestions on media include acrylic or tempera paint), paint brushes, cups, water and pallet for mixing colors*

## REFLECTION

### Reflective Strategies

Students will partner up with one another to reflect on what they saw. Students will swap drawings with their partner and hypothesize what the image represents. They will then take turns explaining to their partner what their drawing represents.

Teacher will allow students reflection time using the following prompts that students can either discuss or provide feedback using the **Written Reflection Form** (see Downloads).

#### Specific reflection questions for class discussion:

- When you drew your sketch, how did the microscope help you?
- Why is perspective important when turning your cell into a piece of art?
- How is the artistic process of creating a piece of art similar to the scientific process of examining a specimen?
- Tell me about your cell organelles. How did you know this was the cell wall? Cell membrane? Nucleus? Chloroplasts?
- What do you notice about the shapes of these organelles?
- Do you notice any similarities between the job of a scientist and the job of a visual artist?

## DIFFERENTIATION

### **Below Grade Level:**

- Students will view prepared slides online to accommodate individual differences as needed. Students will be in heterogeneous groups so peer tutoring will be available for students who need further assistance. Also, teacher will be available to assist students as needed.

### **Above Grade Level:**

- Students create detailed drawings of two different specimens and compare and contrast the two specimens. Students will write about their observations.

### **EL Students:**

- Throughout this lesson, pair EL students with high achieving students. They will work together instead of individually. The pair will continually converse with one another. This allows for reinforcement of the science vocabulary terms, as well as extended discussions to take place. Furthermore this partnership will assist in a deeper understanding of the concepts being taught.

### Small Group Instruction

Students will rotate through 5 stations set up with microscopes or slide viewers to observe prepared slides of various cells. Students will choose one of the cells they viewed to illustrate on their “microscope field of view” sheets.

## APPENDIX

- Field of View handout
- Written Reflection Sheet Project 1



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## Project 2: Movement and Music in the Plant Cell

Animal and Plant Cells • Relationships/  
Parts of a Whole/Comparison



### Project Essential Questions

- What are the functions of the various plant cell organelles?
- How can I use movement and music to help me learn the different functions of each plant organelle?

#### PROJECT DESCRIPTION

This lesson introduces the various organelles in a plant cell (chloroplast, cytoplasm, cell wall, cell membrane, nucleus). Students create riddles for the various organelles. Students then explore applying rhythms and movements to the organelles that support the function.

#### LEARNING TARGETS

“I Can...”

- Identify and label the various parts of a plant cell
- Interpret the function of the different organelles
- Use movement and rhythm to help me learn the different functions of each organelle in a plant cell

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**DURATION: 2 days**

Lesson Description	Learning Targets
This lesson introduces the various organelles in a plant cell (chloroplast, cytoplasm, cell wall, cell membrane, nucleus). Students create riddles for the various organelles. Students then explore applying rhythms and movements to the organelles that support the function.	<p>“I Can...”:</p> <ul style="list-style-type: none"><li>• Identify and label the various parts of a plant cell</li><li>• Interpret the function of the different organelles</li><li>• Use movement and rhythm to help me learn the different functions of each organelle in a plant cell</li></ul>

### ESSENTIAL QUESTIONS

- What are the functions of the various plant cell organelles?
- How can I use movement and music to help me learn the different functions of each plant organelle?

### STANDARDS

Curriculum Standards	Arts Standards
<p><b>S5L3.</b> Students will diagram and label parts of various cells</p> <p>a. Use magnifiers such as microscopes or hand lenses to observe cells and their structure</p> <p>b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus) and determine the function of the parts</p> <p><b>S5P1.</b> Students will verify that an object is the sum of its parts</p> <p>b. Investigate how common items have parts that are too small to be seen without magnification</p>	<p><b>M5GM.8.</b> Understanding relationships between music, the other arts, and disciplines outside the arts</p> <p><b>D5FD.4.</b> Understands and applies music concepts to dance</p> <p>b. Exhibits and creates variety in movement qualities in response to a variety of musical selections and instruments</p> <p>c. Demonstrates musicality while performing dance phrases</p> <p><b>D5CO.4.</b> Demonstrates an understanding of dance as it relates to other areas of knowledge</p>

### KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"><li>• Chloroplast</li><li>• Cell wall</li><li>• Cytoplasm</li><li>• Nucleus</li><li>• Cell membrane</li></ul>	<ul style="list-style-type: none"><li>• Tempo</li><li>• Non-locomotor movement</li><li>• Note values (music class)</li></ul>



### TECHNOLOGY INTEGRATION

- Song: *Cells* by They Might Be Giants (<https://www.youtube.com/watch?v=ZK6YP1Smbxk>)

### ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"><li>Teacher's anecdotal notes during the Choral Movement/Rhythm Responses</li></ul>	<ul style="list-style-type: none"><li><b>Cell Function Riddle:</b> Students create and display their own riddle to be shared with the class.</li><li><b>Written Reflection</b> (see Downloads)</li></ul>

### MATERIALS

"Cell Function Riddles," Rubric (see Downloads)

#### Activating Strategy (5-10 min)

- Cell Diagram will be on board (labeled) and the song *Cells* by They Might Be Giants can be found at <https://www.youtube.com/watch?v=ZK6YP1Smbxk>.
- Teacher will ask students to talk in small groups about what they think each part's function is based on the labeled cell diagram.
- Teacher will keep student-led list for each cell organelle.

#### Main Activity

##### Part 1:

- Review the quarter note, eighth note, and half note. Demonstrate how quarter notes can be tapped or clapped to the syllables in each word. Go through all of the organelles and apply rhythms to them.
- After the 5 plant cell organelles are taught, the teacher will lead the students in developing motions for each of the cell organelles. (**Ex.** NUCLEUS = 3 quarter note pats (syllables) on the top of the head.) The dance movements should reflect the function of the cell to help with associating the function with the movement. For instance, the "Nucleus" is the boss of the cell. Encourage students to create a movement that they may see a boss character do.

##### Part 2:

- After the students have developed a class list of motions, students will get into small groups and be given an organelle. Each small group is asked to create a riddle for the organelle assigned.

##### Part 3

- Lead the class in reviewing the choreography and rhythm assigned to each organelle.
- Teacher demonstrates this by modeling 5 different teacher-made riddles as the class responds. (Refer to "**Cell Function Riddles**" in Downloads.)

##### Part 4

- Each small group is asked to go to the front of the class and read their riddle.
- The class will then try to guess the organelle by using the motion assigned for that specific organelle.

### **Part 5**

- Students will use a piece of colored construction paper to write their riddles on.
- They will fold the sheet in half, write the riddle on the front cover, then write the answer under the flap.
- Take the student-created riddles and showcase them somewhere specific in the classroom.
- Create an interactive display where the students can go to read the riddles and then flip display to view the riddle's answer and the organelle.

## **REFLECTION**

### **Reflective Strategies**

Teacher will allow students reflection time using the following prompts that students can either discuss or provide feedback using the **Written Reflection Form** (see Downloads).

#### **Specific reflection questions for class discussion:**

- What were the artistic choices I made? Why did I pick the specific movement and rhythm for my organelle?
- Why is it important to know the function of each plant cell organelle?
- Think back on the choreography created by you and your classmates. Describe the role of the below organelles:
  - nucleus
  - cell membrane
  - cell wall
  - cytoplasm
  - chloroplasts

## **DIFFERENTIATION**

Below Grade Level:

- Students may be provided with a list of the names of individual organelles and randomized list of functions for visual matching ability.

Above Grade Level:

- Individual subgroups of students can create different motions for the various functions of the organelles, instead of sharing in a classroom set of dance motions and musical beats.
- Students write their own riddles for the specific functions of all of the organelles instead of just the one assigned to their group.

EL Students:

- Consider going over the science vocabulary words ahead of time using colorful diagrams and small group discussions. Do this ahead of time so students grow more familiar with the words.

## **APPENDIX**

- Cell Function Riddles
- Written Reflection Sheet Project 2

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## Project 3: Using Tableau to Become a Plant Cell

Animal and Plant Cells • Relationships/  
Parts of a Whole/Comparison



### Project Essential Questions

- What are the functions of the various plant cell organelles?
- How can I use tableaux to analyze the functions of the organelles in a plant cell?

#### PROJECT DESCRIPTION

Students will integrate their knowledge of previously taught organelles in a plant cell with theatre arts. Students will use the different organelles (chloroplast, cell wall, cell membrane, cytoplasm, and nucleus) to construct tableaux of plant cells. They will then dramatize the organelles by understanding their function in the cell and their relationship with the other organelles.

#### LEARNING TARGETS

"I Can..."

- Identify the various parts and functions of a plant and animal cell
- Use theatrical arts (tableaux) to demonstrate my understanding of the organelles, their function, and their relationship with one another

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**DURATION: 2 days**

Lesson Description	Learning Targets
Students will integrate their knowledge of previously taught organelles in a plant cell with theatre arts. Students will use the different organelles (chloroplast, cell wall, cell membrane, cytoplasm, and nucleus) to construct tableaus of plant cells. They will then dramatize the organelles by understanding their function in the cell and their relationship with the other organelles.	<p>“I Can...”:</p> <ul style="list-style-type: none"><li>• Identify the various parts and functions of a plant and animal cell</li><li>• Use theatrical arts (tableaus) to demonstrate my understanding of the organelles, their function, and their relationship with one another</li></ul>

**ESSENTIAL QUESTIONS**

- What are the functions of the various plant cell organelles?
- How can I use tableaus to analyze the functions of the organelles in a plant cell?

**STANDARDS**

Curriculum Standards	Arts Standards
<p><b>S5L3.</b> Students will diagram and label parts of various cells</p> <p>b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus) and determine the function of the parts</p> <p><b>S5P1.</b> Students will verify that an object is the sum of its parts</p>	<p><b>TAES5.3.</b> Acting by developing, communicating, and sustaining roles within a variety of situations and environments</p> <p><b>TAES5.7.</b> Integrating various art forms, other content areas, and life experiences, to create theatre</p>

**KEY VOCABULARY**

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"><li>• Chloroplast</li><li>• Cytoplasm</li><li>• Cell wall</li><li>• Cell membrane</li><li>• Nucleus</li><li>• Function</li><li>• Structure</li></ul>	<ul style="list-style-type: none"><li>• Tableau</li><li>• Principles of tableau:<ol style="list-style-type: none"><li>1. Levels</li><li>2. Facial expression</li><li>3. Relationships between characters</li><li>4. Audience visibility</li></ol></li></ul>

## ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"> <li>Teacher can monitor students through anecdotal notes for understanding of tableau elements, plant cell organelle concept understanding, and teamwork.</li> </ul> <p><b>Questions to ask after tableaus are created:</b></p> <ol style="list-style-type: none"> <li>1) Why did you choose that body level for your organelle?</li> <li>2) Why did you choose that facial expression?</li> <li>3) What is the relationship that your organelle had with the other organelles?</li> </ol>	<ul style="list-style-type: none"> <li><b>Informational Writing Piece:</b> Students will write a monologue from the viewpoint of their cell organelle “character.”</li> <li><b>Informational Cell Monologue Rubric</b> (see Downloads)</li> <li><b>Written Reflection</b> (see Downloads)</li> </ul>

## MATERIALS

Index cards with plant cell organelles listed individually (chloroplast, cell wall, cell membrane, cytoplasm, nucleus), **Informational Cell Monologue Rubric** (see Downloads)

Activating Strategy
<ul style="list-style-type: none"> <li>Begin this project by letting students know that “tableau” means “frozen picture.”</li> <li>Explain to students that today we will use our bodies to create frozen pictures.</li> <li><u>Begin by having students stand up and create the following tableaus:</u> <ol style="list-style-type: none"> <li>1) 102 year old grandparent crossing the street</li> <li>2) Baseball player focusing on hitting the ball</li> <li>3) A chef that dropped a pizza</li> </ol> </li> </ul> <p>*Introduce the “<b>principles of tableau</b>” and discuss how creating a strong tableau requires a clear body level (low, mid, high) and big facial expressions.</p> <ul style="list-style-type: none"> <li>Direct students to get into small groups (3-5 students) so we can now explore creating relationships.</li> <li><u>Direct students to create a tableau of:</u> <ol style="list-style-type: none"> <li>1) A family portrait</li> <li>2) A teacher and students in class</li> <li>3) A castle (using just their bodies)</li> </ol> </li> </ul> <p>*Draw attention to how creating a strong tableau requires establishing clear relationships and making sure the audience can see our faces.</p>
<p><b>Classroom Tips:</b> When cueing students to create a tableau as a group, give them a count down. Ex: “Okay class, get into your tableau on a 3, 2, 1, FREEZE!”</p>
<p>Teacher will describe to students that in today’s lesson, they will create a tableau. Teacher will then hand out individual index cards with the plant cell organelle names listed to students. (Teacher might differentiate lower level cards—easier organelles/functions—to lower level students).</p>



### Process

#### Part 1: Idea

- Teacher will list each specific organelle on the board for students to make sure that it is in the tableau that they are going to create.

#### Part 2: Research

- Teacher will review the tableau elements. (Reminder to students about level, audience awareness, facial expression, and relationships.)
- Students will quickly review the functions of each organelle.

#### Part 3: Create

- Students will create a small group tableau that shows how the organelles relate to one another.
- Students will have 1 minute to strike their organelle tableau. (Example: Nucleus could be shown by holding the head for the “brain” and pointing to another organelle in an authoritative manner.)
- Teacher will then walk around the classroom and tap individual students on the shoulder. The student that is tapped must then be able to reply with a 1 sentence statement regarding the function of their organelle. This is called thought-tracking.

#### Part 3: Evaluate/ Rework

- After the tableau, students will then be directed in writing an informational narrative from the point of view of their cell organelle. The student must take what they know as the function of that organelle and produce an informational monologue, which will eventually be presented to the class.
- Students must write from the viewpoint of that character and be sure to include all applicable content area vocabulary relevant to their organelle. Students will be graded using the **Informational Writing Rubric** (see Downloads).

#### Part 4: Present

- Students will then share their cell organelle monologue with the class. Other classroom students may provide constructive feedback on theatrical delivery (diction, facial expression, tone, volume, pitch, etc.) using theatre arts vocabulary.

### REFLECTION

#### Reflective Strategies

##### Writing Reflection (see Downloads)

- 1) How did using tableau help me understand the plant cell and the roles of the organelles?
- 2) My facial expression in the tableau was \_\_\_\_\_. I made this choice because....

### DIFFERENTIATION

#### Option:

- Group students for tableaux in heterogeneous groups, combining below level/EL/above grade level students together for better explanation/mastery of content.

#### Below Grade Level/EL Students:

- Create a whole-class tableau to model the various elements of a tableau before having the students break into small groups and performing their own individual tableau.

**Above Grade Level:**

- Have the students create a sketch of their tableau to show the relationship and connection/location between each cell organelle and explain its specific function. On the sketch, students must label the organelles and describe the function of each organelle in 4 words or less (for each organelle).

**APPENDIX**

- **Informational Cell Monologue Rubric**
- **Tableau Self Assessment**
- **Written Reflection Sheet Project 3**

**CREDITS**

U.S. Department of Education  
Arts in Education--Model Development and Dissemination Grants Program  
Cherokee County (GA) School District and ArtsNow, Inc.  
Ideas contributed and edited by: Taylor Stewart, Danny Arnett, Jessica Espinoza, Richard Benjamin Ph.D., Michele McClelland



## Project 4: Cell Rap

Animal and Plant Cells • Relationships/  
Parts of a Whole/Comparison



### Project Essential Questions

- What are the functions of the various animal and plant cell organelles?
- How can music be used to create connections between the two types of cells?

#### PROJECT DESCRIPTION

This project integrates music and visual arts into students' study of both plant and animal cells. In this project students will compare and contrast the organelles in both an animal cell and plant cell. Students will create a rap that shows their understanding of how the individual organelles function in both types of cell.

#### LEARNING TARGETS

"I Can..."

- Identify the various organelles in an animal cell and plant cell
- Compare and contrast animal and plant cells
- Explain the function of the various organelles
- Label the various organelles in cells
- Create a musical rap that demonstrates my understanding of the science concept

**[www.artsnowlearning.org](http://www.artsnowlearning.org)**

Units provide differentiated ideas and activities aligned to a sampling of standards.  
The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program  
Cherokee County (GA) School District and ArtsNow, Inc.

**DURATION: 3-4 days**

Project Description	Learning Targets
This project integrates music and visual arts into students' study of both plant and animal cells. In this project students will compare and contrast the organelles in both an animal cell and plant cell. Students will create a rap that shows their understanding of how the individual organelles function in both types of cell.	<p>"I Can..."</p> <ul style="list-style-type: none"><li>• Identify the various organelles in an animal cell and plant cell</li><li>• Compare and contrast animal and plant cells</li><li>• Explain the function of the various organelles</li><li>• Label the various organelles in cells</li><li>• Create a musical rap that demonstrates my understanding of the science concept</li></ul>

**ESSENTIAL QUESTIONS**

<ul style="list-style-type: none"><li>• What are the functions of the various animal and plant cell organelles?</li><li>• How can music be used to create connections between the two types of cells?</li></ul>
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**STANDARDS**

Curriculum Standards	Arts Standards
<p><b>S5P1.</b> Students will verify that an object is the sum of its parts</p> <p><b>S5L3.</b> Students will diagram and label parts of various cells (plant, animal, single-celled, multi-celled)</p>	<p><b>M5GM.1.</b> Singing, alone and with others, a varied repertoire of music</p> <p><b>M5GM.4.</b> Improvising melodies, variations, and accompaniments</p> <p><b>M5GM.5.</b> Composing and arranging music within specified guidelines</p> <p><b>M5GM.8.</b> Understanding relationships between music, the other arts, and disciplines outside the arts</p>

**KEY VOCABULARY**

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"><li>• Animal cell</li><li>• Cell membrane</li><li>• Chloroplasts</li><li>• Cytoplasm</li><li>• Nucleus</li><li>• Plant cell</li><li>• Structure</li></ul>	<ul style="list-style-type: none"><li>• Articulation</li><li>• Beat</li><li>• Crescendo</li><li>• Decrescendo</li><li>• Form</li><li>• Legato</li><li>• Melody</li></ul>



**Part 2:**

- The teacher will ask the students to compare and contrast the two cells based on what we learned from our raps. (*Why does the plant cell have organelles that the animal cell does not include?*)
- Together as a class, begin a 5-line rap together that compares and contrasts the 2 types of cells.
- Students get back in groups and independently finish the last 5 lines of the compare/contrast rap.
- Groups share their different endings.

**Part 3:**

- Students work collaboratively in groups to create Word Art for all of the organelles in the cell they were exploring.
- The students must use the properties of each organelle and the function to best illustrate the vocabulary word. (Example: Cytoplasm might be "**oozing**" and use thick shaped letters and have pieces inside—representative of it's function and physical properties).

**REFLECTION**

**Reflective Strategies**

- **Written Reflection Questions** (see Downloads)

**Reflection Questions:**

1. How would I rate myself on the understanding of the differences between plant and animal cells and their organelles?
2. How does music and writing a song help me understand the concept of the differences between plant and animal cells?

**DIFFERENTIATION**

**Below Grade Level:**

- These groups of students can work with the entire class to create the 10-line rap song, and focus more on their performance and mastery of the content. Consider splitting the class into 2 groups and having a Rap Battle.

**Above Grade Level:**

- These groups of students can create the entire rap by themselves, instead of working with the entire class.

**EL Students:**

- Instead of working in homogeneous groups to create the last 5 lines of the rap, the teacher would pair an EL student with a higher fluency/language student to work together in a one-on-one collaborative pair.



**APPENDIX**

- **Written Reflection Sheet Project 4**
- **Cell Rap Rubric**

**CREDITS**

U.S. Department of Education  
Arts in Education--Model Development and Dissemination Grants Program  
Cherokee County (GA) School District and ArtsNow, Inc.  
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## Project 5: Cell Debate

Animal and Plant Cells • Relationships/  
Parts of a Whole/Comparison



### Project Essential Questions

- How can we use drama to compare and contrast animal and plant cell organelles?
- How can we use informational and opinion writing to express our scientific discoveries?
- What are the functions of the various plant and animal cell organelles?

#### PROJECT DESCRIPTION

Students will integrate theatre and explore the roles of the organelles in both plant and animal cells. This project will require students to role-play in the various organelle roles and then write an informational opinion piece about why their organelle is the most crucial cell part. Students will rehearse and perform in a cell organelle debate where they will defend their arguments. Students will work as a team to debate a common goal together.

#### LEARNING TARGETS

“I Can...”

- Use informational writing to share my knowledge of my scientific discoveries
- Use opinion writing to express my viewpoint about a certain topic
- Use theatrical techniques to show my overall learning process

**[www.artsnowlearning.org](http://www.artsnowlearning.org)**

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The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program  
Cherokee County (GA) School District and ArtsNow, Inc.

**DURATION: 1-3 days**

Project Description	Learning Targets
Students will integrate theatre and explore the roles of the organelles in both plant and animal cells. This project will require students to role-play in the various organelle roles and then write an informational opinion piece about why their organelle is the most crucial cell part. Students will rehearse and perform in a cell organelle debate where they will defend their arguments. Students will work as a team to debate a common goal together.	<p>"I Can..."</p> <ul style="list-style-type: none"><li>• Use informational writing to share my knowledge of my scientific discoveries</li><li>• Use opinion writing to express my viewpoint about a certain topic</li><li>• Use theatrical techniques to show my overall learning process</li></ul>

**ESSENTIAL QUESTIONS**

- How can we use drama to compare and contrast animal and plant cell organelles?
- How can we use informational and opinion writing to express our scientific discoveries?
- What are the functions of the various plant and animal cell organelles?

**STANDARDS**

Curriculum Standards	Arts Standards
<p><b>S5L3.</b> Students will diagram and label parts of various cells</p> <p>a. Use magnifiers such as microscopes or hand lenses to observe cells and their structure</p> <p>b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus) and determine the function of the parts</p> <p><b>ELAGSE5W1.</b> Write opinion pieces on topics or texts, supporting a point of view with reasons</p> <p>a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose</p> <p>b. Provide logically ordered reasons that are supported by facts and details</p> <p>c. Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically)</p> <p>d. Provide a concluding statement or section related to the opinion presented</p>	<p><b>TAES5.2.</b> Developing scripts through improvisation and other theatrical methods</p> <p><b>TAES5.3.</b> Acting by developing, communicating, and sustaining roles within a variety of situations and environments</p> <p><b>TAES5.7.</b> Integrating various art forms, other content areas, and life experiences, to create theatre</p>

**ELAGSE5W2.** Write informative/explanatory texts to examine a topic and convey ideas and information clearly  
b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic  
d. Use precise language and domain-specific vocabulary to inform about or explain the topic

## KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"> <li>• Cell membrane</li> <li>• Cell wall</li> <li>• Chloroplast</li> <li>• Cytoplasm</li> <li>• Function</li> <li>• Informational writing</li> <li>• Nucleus</li> <li>• Opinion</li> <li>• Persuasive/persuade</li> <li>• Structure</li> </ul>	<ul style="list-style-type: none"> <li>• Character</li> <li>• Concentration</li> <li>• Diction</li> <li>• Face-out</li> <li>• Facial expression</li> <li>• Gesture</li> <li>• Monologue</li> <li>• Objective</li> <li>• Projection</li> </ul>

## TECHNOLOGY INTEGRATION

- Song: *Cells* by Mr. Parr <https://www.youtube.com/watch?v=wRZthGlzEUc>
- Video Camera/Phone Camera (ability to immediately stream)

## ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"> <li>• <b>Informational Writing and Science content:</b> (conversation/teacher observation)</li> <li>• Students will work collaboratively in groups to determine debate points about why their organelle is best.</li> <li>• Create different <b>monologues</b> for organelles in both plant and animal cells.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Cell Debate Video Self-Assessment</b> (see Downloads): Students will rate themselves on their recorded video debate after it is watched after the debate.</li> <li>• <b>Written Reflection</b> (see Downloads)</li> </ul>

## MATERIALS

Computer (to stream Student video and YouTube video clip), Video Camera/Phone Camera



**Activating Strategy (5-10 min)**

- Have the song *Cells* by Mr. Parr <https://www.youtube.com/watch?v=wRZthGlzEUc> playing when walking into the room.
- Ask students to listen for familiar vocabulary words, and have students write down familiar vocabulary terms.
- As a class, discuss the vocabulary identified and reinforce the meaning of the words.

**Main Activity**

**Part 1:**

- Place students in small groups and give them each an index card in their group.
- Each group should have an individual index card for each of the plant cell's organelles.
- Tell students that today they will be role-playing and stepping into the role of the particular organelle listed on their card.
- Direct students to think about character traits that their organelle might possess if brought to life. (Example: the "nucleus" may be bossy and stern based on its function in a cell.)
- Direct students to write down 3 character traits for their organelle on the backside of the index card.
- Students introduce themselves and their traits to their peers in their small group applying vocal choices to their characters.
- Model for students how to use pitch and tempo to change your regular speaking voice.

**Suggested vocal exercise:**

- Try saying "Good Morning Class" using a gruff, low voice.
- Try saying "Good Morning Class" using a high, timid, squeaky voice.
- Try saying "Good Morning Class" using a smooth, sing-songy voice.
- Direct students to think about their own organelle character voice and make a vocal choice.

**Part 2:**

- Give students the following writing prompt:  
"Today we are going to pretend that the cell we all live and work in is awarding a promotion to only one organelle. The most important organelle will get the promotion! We will be conducting a debate that determines which organelle is most worthy of a promotion. Before we have the debate you will need to prepare your argument."
- The students will then be given a set amount of time to independently work on writing an informational monologue from the viewpoint of that specific organelle as to why they are the most important part of the cell.  
\*An example of a **Persuasive Monologue** can be found in Downloads.

**Part 3:**

- After students have completed their writing, the students will return into their small groups they were placed in during Part 1.
- Students will come up with discussion points about why their cell part is the most important.
- As a class, develop a list of questions that students could ask characters during the debate.
- Direct the questions to stay open-ended enough to really allow students to improvise and express their responses with evidence from their notes.
- Set up the room for a panel of guests to sit in front of the room in a line of chairs. This group should be one of the small groups that includes all of the different organelles in a cell.
- Ask that the remaining students step in-role as reporters to ask questions during the debate.

- The members of the group that was selected to participate in the debate perform their responses to each question in character as their organelles.
- During the debate, the teacher will use the **Assessment** (see Downloads) to assess students during the activity.
- On various days, you can allow for different groups to participate as guests in the debate, sitting in the front of the room.
- The teacher should be in role as the “moderator” to help facilitate the discussion and the time given to each character to respond to the given question.

## REFLECTION

### Reflective Strategies

#### Potential Reflection Questions:

- What acting choices did you make for your organelle? Why?
- What was the most persuasive point you made during the debate?
- What would happen if your organelle was not present in the cell?
- Next time you prepare for a debate, what things do you think are most important for you to think about?
- **Written Reflection Sheet** (see Downloads)

## DIFFERENTIATION

#### **Below Grade Level/EL Students:**

- Cue cards for children who have trouble remembering their talking points
- Sentence Frames for scaffolding the opinion writing

#### **Above Grade Level:**

- Encourage these students to research further in order to add to the debate question: Why is their organelle the most powerful/important in regards to the respiration/photosynthesis cycle that happens in plants? They could also teach and explain their theory to other students.

(<http://www.vtaide.com/png/photosynthesis.htm>)

## OPTIONAL RESOURCES

Song: *Cells* by Mr. Parr (<https://www.youtube.com/watch?v=wRZthGlzEUc>)

Great example of debate using cell organelles: [https://www.youtube.com/watch?v=808kmKBBW\\_o](https://www.youtube.com/watch?v=808kmKBBW_o)

## APPENDIX

- **Written Reflection Sheet Project 5**
- **Persuasive Monologue example**
- **Cell Debate Video Self Assessment**

**CREDITS**

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Arts in Education--Model Development and Dissemination Grants Program  
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## Project 6: 3-D Cell Models

Animal and Plant Cells • Relationships/  
Parts of a Whole/Comparison



### Project Essential Questions

- What is the relationship between each organelle?
- How do the 3-D sculptures of the animal cells compare and contrast to the 3-D sculptures of the plant cells?
- What new discoveries have you made about the composition of a cell when constructing a three-dimensional sculpture?

#### PROJECT DESCRIPTION

Students will create a three-dimensional sculpture of an animal or plant cell. They will use various objects and mixed media to work as a group and construct a model. Students will then explore what they notice when they examine a cell from a 3D lens.

#### LEARNING TARGETS

“I Can...”

- Create a model of a plant/animal cell and label the organelles
- Explain the function of each organelle within the cell

[www.artsnowlearning.org](http://www.artsnowlearning.org)

Units provide differentiated ideas and activities aligned to a sampling of standards.  
The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program  
Cherokee County (GA) School District and ArtsNow, Inc.



**DURATION: 2 days**

Project Description	Learning Targets
Students will create a three-dimensional sculpture of an animal or plant cell. They will use various objects and mixed media to work as a group and construct a model. Students will then explore what they notice when they examine a cell from a 3D lens.	<p>"I Can..."</p> <ul style="list-style-type: none"> <li>• Create a model of a plant/animal cell and label the organelles</li> <li>• Explain the function of each organelle within the cell</li> </ul>

**ESSENTIAL QUESTIONS**

<ul style="list-style-type: none"> <li>• What is the relationship between each organelle?</li> <li>• How do the 3-D sculptures of the animal cells compare and contrast to the 3-D sculptures of the plant cells?</li> <li>• What new discoveries have you made about the composition of a cell when constructing a three-dimensional sculpture?</li> </ul>
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**STANDARDS**

Curriculum Standards	Arts Standards
<p><b>S5P1.</b> Students will verify that an object is the sum of its parts</p> <p><b>S5L3.</b> Students will diagram and label parts of various cells (plant, animal, single-celled, multi-celled)</p> <p>b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus)</p>	<p><b>VA5PR.1.</b> Creates artworks based on personal experience and selected themes</p> <p><b>VA5PR.3.</b> Understands and applies media, techniques, and processes of 3 dimensional works of art using tools and materials in a safe and appropriate manner to develop skills</p> <p><b>VA5PR.4.</b> Plans and participates in appropriate exhibitions of artworks</p>

**KEY VOCABULARY**

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"> <li>• Cell</li> <li>• Cell wall</li> <li>• Cell membrane</li> <li>• Chloroplast</li> <li>• Cytoplasm</li> <li>• Nucleus</li> <li>• Organelle</li> </ul>	<ul style="list-style-type: none"> <li>• Media</li> <li>• Model</li> <li>• Sculpture</li> <li>• Techniques</li> <li>• Three-dimensional</li> <li>• Title</li> </ul>

## TECHNOLOGY INTEGRATION

- Students can use the interactive cell activity to review their knowledge available from:  
[http://www.cellsalive.com/cells/cell\\_model.htm](http://www.cellsalive.com/cells/cell_model.htm)

## ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"><li>Teacher observations and questioning while students are working on constructing their cell sculptures</li></ul>	<ul style="list-style-type: none"><li>Completion of a model of a cell with organelles correctly labeled</li><li><b>3D Cell Model Self-Assessment Checklist</b> (see Downloads)</li></ul>

## MATERIALS

### **Suggested Materials (not limited to these):**

Colored modeling clay or play dough, cotton balls, various size beads, dry beans, dry pasta (various types, colors, sizes), aluminum foil, string, yarn, various sized ribbons, paper clips, markers, pipe cleaners, various size colored pom-poms, toothpicks, toothpick flags with cell organelle names (both plant and animal cells)

### Activating Strategy (5-10 min)

- Review student knowledge of plant and animal cells and their organelles using diagrams:

#### **Plant Cell:**

<https://confluence.crbs.ucsd.edu/download/attachments/25821655/Plant+Cell.jpg?version=1&modificationDate=1297160683000>

#### **Animal Cell:**

<https://confluence.crbs.ucsd.edu/download/attachments/25821655/Animal+Cell.jpg?version=1&modificationDate=1297160683000>

### Main Activity

#### **Part 1:**

- Students begin the artistic process of creating their sculpture/3-D model by first sketching and labeling their plant cell on drawing paper.
- Students are placed in groups, and students share their sketches with their group members.
- Students discuss the sketches and together collaborate and create a plan for their group's sculpture/3-D model.

#### **Part 2:**

- The students will work in groups using the materials provided to create their model of a cell and label the organelle's parts.
- Students will use the **Self-Assessment Checklist** (see Downloads) individually.
- Students will take a picture of their cell using a class camera or iPad to upload to the class website and email to teacher.

## REFLECTION

### Reflective Strategies

**“3-D Cell Model” Self-Assessment Checklist** (see Downloads):

Students will be required to reflect on their own process of learning and justifying decisions for both science content/artistic decisions.

## DIFFERENTIATION

### Option:

- Teacher will group students accordingly and will also assist groups as needed to ensure models are correct.

### Below Grade Level/EL Students:

- Before students begin designing their sculpture or 3-D model, students can practice locating and identifying plant cell organelles using an interactive cell activity available from [http://www.cellsalive.com/cells/cell\\_model.htm](http://www.cellsalive.com/cells/cell_model.htm)

### Above Grade Level:

- Students will have to make a 3-D model for both the plant and animal cell and label them.

### Small Group Instruction

Students will work in small groups to create and label a model of a cell.

(Groups can be homogeneous OR heterogeneous according to teacher discretion based on student population.)

## APPENDIX

- “3-D Cell Model” Self-Assessment Checklist**

## CREDITS

U.S. Department of Education

Arts in Education--Model Development and Dissemination Grants Program

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