

## ARTS IMPACT LESSON PLAN

### Theater and Science Infused Lesson

#### Scientific Sequence Slide Show

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#### Enduring Understanding

Cause and effect can be shown through a sequence of actions and reactions.

#### Lesson Description (Use for family communication and displaying student art)

*Students will brainstorm in groups, using evidence to construct meaning and determine the cause, change, and effect of a scientific sequence or process. They will identify and physically express the main components of the process and their actions as characters in a tableau – a frozen stage picture. Each group will present a series of tableaux that represent three stages in a cause and effect sequence. Students will use scientific evidence to question or explain their artistic choices.*

### Learning Targets and Assessment Criteria

**Target:** Identifies the main action (cause) in the beginning of a scientific sequence.

**Criteria:** Names, and physically recreates in a tableau, the cause of the sequence.

**Target:** Identifies the main action (change/reaction) in the middle of a scientific sequence.

**Criteria:** Names, and physically recreates in a tableau, the change in the sequence.

**Target:** Identifies the main action (effect) that is found in the end of a scientific sequence.

**Criteria:** Names, and physically recreates in a tableau, the effect in the sequence.

**Target:** Understands and demonstrates the sequential actions and reactions in a scientific process.

**Criteria:** Presents tableaux in sequential order (cause, change, and effect). Varies physical choices (face, body and spatial relationships) to show change.

**Target:** Thinks critically.

**Criteria:** Uses evidence to question or explain artistic choices and construct meaning.

#### Vocabulary

##### Arts Infused:

Action  
Reaction  
Character  
Cause  
Effect  
Change  
Beginning  
End  
Middle  
Meaning  
Artistic Choice  
Critical Thinking

##### Science:

TBD based on selected scientific process  
Evidence

##### Arts:

Statue  
Tableau

#### Materials

##### Museum Artworks or Performance

##### Seattle, WA

Book-It Repertory Theatre  
Living Voices  
Seattle Children's Theatre

##### Tacoma, WA

Broadway Center for the Performing Arts

##### Materials

Selected scientific processes; Elements of Tableau checklist; Student Worksheets: graphic organizers; Class Assessment Worksheet, Critical Thinking Self-Assessment worksheet

##### Connections:

Teachers College Readers Workshop

##### Tools

Body, voice, imagination

#### Learning Standards

##### WA Arts Learning Standards in Theatre

For the full description of each standard, see:

<http://www.k12.wa.us/Arts/Standards>

##### Creating (Concepts: Character, Plot, Conflict, Movement/Stance, Gesture, Facial Expression)

1. Generate and conceptualize artistic ideas & work.
2. Organize and develop artistic ideas and work.
3. Refine and complete artistic work.

##### Performing/Presenting/Producing

4. Select, analyze, and interpret artistic work for presentation.

*continued*

5. Develop and refine artistic techniques and work for presentation.

6. Convey meaning through the presentation of artistic work.

**Responding**

7. Perceive and analyze artistic work.

8. Interpret intent and meaning in artistic work.

9. Apply criteria to evaluate artistic work.

**Connecting**

11. Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding.

**Early Learning Guidelines (Pre-K – Grade 3)**

*For a full description of Washington State Early Learning and Child Development Guidelines see:*

<https://www.del.wa.gov/sites/default/files/imported/publications/development/docs/guidelines.pdf>

(Age 4-5) 3. Touching, seeing, hearing, and moving around: Using the large muscles (gross motor skills). (Kindergarten) 6. Learning about my world: Science: Understand that the things people do may change the environment. Recognize that a child's own actions have an effect on the environment for better or worse.

(Age 4-5) 6. Learning about my world: Arts: Show creativity and imagination, perform elements of drama, participate in dramatic play. Understand that different art forms (such as drama) can be used to tell a story.

**Next Generation Science Standards**

*For a full description of Next Generation Science Standards see:*

<http://www.nextgenscience.org/next-generation-science-standards>

**Topic:**

Forces and Interactions: Pushes and Pulls

Earth's Systems: Processes that Shape the Earth  
Structure and Properties of Matter

**Disciplinary Core Ideas:**

PS1.A: Structure and Properties of Matter

PS1.B: Chemical Reactions

PS4.B: Electromagnetic Radiation

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

LS4.C: Adaptation

can change the environment to meet their needs.

*continued*

ESS2.A: Earth Materials and Systems  
ESS2.C: The Role of Water in Earth's Surface Processes  
ESS3.C: Human Impact on Earth Systems

*Other Core Ideas and Performance Expectations can also be explored depending on the Science Concept or Process that is specifically used.*

**Science Kits Addressed:**

PreK: Exploring Water  
K: Animals  
1: Weather  
2: Liquids; Soils  
3: Rocks and Minerals; Plant Growth and Development  
4: Ecosystems; Food Chemistry  
5: Land and Water

**Performance Expectations:**

K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans)

1-PS4-3. Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.

2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weather or the rate of erosion by water, ice, wind, or vegetation.

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

**Crosscutting Concepts:**


Cause and Effect: Mechanism and Explanation

**Science and Engineering Practices:**

2. Developing and Using Models  
7. Constructing explanations (for science) and designing solutions (for engineering)  
8. Obtaining, Evaluating, and Communicating Information

### ICON KEY:

 = Notes specific *Readers Workshop* Curriculum strategies addressed

 = Indicates note or reminder for teacher

 = Embedded assessment points in the lesson


### Pre-Teach

Optimally, the Arts Foundation Lessons of Expressive Body and Tableau should be taught before this infusion lesson.


If needed, review the selected scientific process(es) before starting the lesson.

### Lesson Steps Outline


**1.** Select the scientific process to be used (it can be more than one process, if desired). Divide the class into groups and lead them in brainstorming the main components and their actions at the beginning of the sequence (cause). Introduce the characteristics of critical thinking.

 Criteria-based process assessment: Identifies the state of being/action (cause) at the beginning of the sequence. Uses evidence to question or explain artistic choices and construct meaning.


**2.** Guide the groups in developing a tableau, or frozen stage picture, that physically expresses the main components and their actions at the beginning of the sequence (cause).

 Criteria-based teacher checklist: Names, and physically recreates in a tableau, the cause of the sequence.  
Criteria-based process assessment: Uses evidence to construct meaning.

**3.** Repeats steps 1 & 2 in creating a tableau for the middle of the sequence, focusing on the changing action/reaction of the process.

 Criteria-based teacher checklist: Names, and physically recreates in a tableau, the change in the sequence.  
Criteria-based process assessment: Uses evidence to construct meaning.

**4.** Repeats steps 1 & 2 in creating a tableau for the end of the sequence, focusing on the effect of the change.

 Criteria-based teacher checklist: Names, and physically recreates in a tableau, the effect in the sequence.  
Criteria-based process assessment: Uses evidence to construct meaning.

**5.** Guide the students in combining all three tableaux into a slide show that demonstrates change that occurs during the cause and effect sequence.

Criteria-based teacher checklist, reflection: Presents tableaux in sequential order (cause, change, and effect). Varies physical choices (face, body and spatial relationships) to show change.

**6.** Guide self and peer reflection, including Critical Thinking Self-Assessment Worksheet.

Criteria-based teacher checklist, self and peer reflection: Uses evidence to question or explain artistic choices and construct meaning.

## LESSON STEPS

▮ Pre-determine how the room will be set-up to create space for small groups to work in the room—move desks as needed.

▮ Note on grade level adaptability for this lesson: This lesson can be adapted for use at any grade level. If the students aren't capable of working independently in groups, the teacher can lead small groups or the whole class through the lesson. If the students can't write, the teacher can work orally with students.

▮ A graphic organizer for listing components and actions is provided with the lesson. Teachers can use this to facilitate the group brainstorming sessions.

### **1. Select the scientific process to be used (it can be more than one process if desired). Divide the class into groups and lead them in brainstorming the main components and their actions at the beginning of the sequence (cause). Introduce the characteristics of critical thinking.**

📖 Mini-lesson: sequence, re-tell

- *The cause of a sequence is the beginning state of the components in the scientific process. It is where you will set up the scenario for what will react with what in this scientific process.*
- *What are the main components of the process?*
- *What is each component doing?*
- *What does each component want or need in order to change—what is the cause of the change?*
- *You will need to use your critical thinking skills to determine each step of the scientific sequence and how you can show it physically. Use evidence and your scientific knowledge to question and construct meaning of the process so that you can demonstrate it through tableau.*

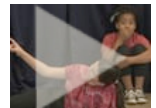
☑ **Criteria-based process assessment:** Identifies the state of being/action (cause) at the beginning of the sequence. Uses evidence to question or explain artistic choices and construct meaning.

### **2. Guide the groups in developing a **tableau**, or frozen stage picture, that physically expresses the main components and their actions at the beginning of the sequence (cause).**

📖 Sequence, re-tell

▮ Review the Elements of Tableau checklist as needed.

- *We are going to make tableaux (taa-blow) of the cause and effect sequence. A tableau is a frozen stage picture. (Tableaux is the plural of tableau, singular).*
- *Tableaux are used to show a setting (where and when something is happening), characters, and the relationships between them. In a tableau, anything portrayed by an actor is a character. Characters can be animate or inanimate—human, animal, plant, object, environmental element, etc. In this lesson, any component of the scientific process is a character.*
- *Use your statues, levels/depth, proximity, and contact to create a tableau of the main characters/components and their actions at the beginning of the sequence (cause).*




Scientific Sequence Slide Show  
Step 2

- *How can you use your face and body to express your character/component in a statue?*
- *How can you show relationships and actions while remaining frozen?*
- *What evidence or scientific knowledge supports the choices you make to demonstrate this part of the scientific process through tableau?*

Criteria-based teacher checklist: Names, and physically recreates in a tableau, the cause of the sequence.

Criteria-based process assessment: Uses evidence to construct meaning.

### **3. Repeats steps 1 & 2 in creating a tableau for the middle of the sequence, focusing on the changing action of the process.**


 Sequence, re-tell

- *The middle of the sequence shows a change of state for the components.*
- *Let's create a tableau that shows the change in the process.*
- *How can you use your face, body, and spatial relationships to show the change that occurs?*
- *How is your component in the process changing? If it is not changing itself, what is it doing to create or react to the change?*
- *What evidence or scientific knowledge support the choices you make to demonstrate this part of the scientific process through tableau?*

Criteria-based teacher checklist: Names, and physically recreates in a tableau, the change in the sequence.

Criteria-based process assessment: Uses evidence to construct meaning.

### **4. Repeats steps 1 & 2 in creating a tableau for the end of the sequence, focusing on the effect of the change.**

 Sequence, re-tell

- *After the changing action, the components demonstrate the effect.*
- *Let's create a tableau that shows the effect of the change.*
- *How can you use your face, body, and spatial relationships to show how the characters/components have changed?*
- *What has changed about your component in the process? If it is hasn't changed itself, how has it been affected by the change?*
- *What evidence or scientific knowledge support the choices you make to demonstrate this part of the scientific process through tableau?*

Criteria-based teacher checklist: Names, and physically recreates in a tableau, the effect in the sequence.

Criteria-based process assessment: Uses evidence to construct meaning.

**5. Guide the students in combining all three tableaux into a slide show that demonstrates the cause and effect sequence.**

📖 Re-enact, synthesizing

- *Now, we are going to put all our tableaux together to show the whole sequence of the process, from beginning to middle to end.*
- *How did your physical choices (statures and spatial relationships) show how the characters/components change through the sequence of actions?*

Criteria-based teacher checklist, reflection: Presents tableaux in sequential order (cause, change, and effect). Varies physical choices (face, body and spatial relationships) to show change.

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**6. Guide self and peer reflection, including Critical Thinking Self-Assessment Worksheet.**

📖 Ask students to fill out self-assessment worksheets, or facilitate verbal discussion (in primary grades) of the critical thinking that students used to demonstrate the scientific process through tableau.

- *Describe an artistic choice you made to show a part of your scientific process.*
- *What evidence supports that artistic choice to demonstrate that aspect of the scientific process?*

Criteria-based teacher checklist, self and peer reflection: Uses evidence to question or explain artistic choices and construct meaning.

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## ***Scientific Sequence Slide Show*** **Elements of Tableau Checklist**

### **Statue: individual facial expression and body shape/gesture**

- Use whole face and body
  - Show character
  - Show action

### **Levels and depth**

- Low/medium/high
- Three dimensional use of stage: Left/right/center, downstage (close to audience)/upstage (far from audience)

### **Character and spatial relationships**

- Eye contact
- Physical contact using positive or negative space (touching or not touching)
- Proximity or distance

### **Open to the audience (cheat out)**

- Make sure all actors can be seen
- Use levels: downstage actors in low space; upstage actors in high space

**Scientific Sequence Slide Show Graphic Organizer**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<b>Component</b>	<b>Beginning Action: Cause</b>	<b>Middle Action: Change</b>	<b>End Action: Effect</b>	<b>Evidence</b>

**ARTS IMPACT LESSON PLAN Arts Infusion**

*Scientific Sequence Slide Show*

Teachers may use or adapt this tool.

**STUDENT SELF-ASSESSMENT WORKSHEET**

Disciplines	THEATER AND SCIENCE						THEATER	THEATER AND SCIENCE	Total
Concept	Beginning/Cause		Middle/Change		End/Effect		Performance Process	Critical Thinking (21 <sup>st</sup> Century Skill)	8
Criteria	Scientific Sequence	Tableau	Scientific Sequence	Tableau	Scientific Sequence	Tableau	Presents, in order, the sequence of the three tableaux (beginning, middle, end). Varies physical choices (face, body and spatial relationships) to show change	Uses evidence to question or explain artistic choices and construct meaning.	
Student Name	Names the cause of the sequence.	Physically recreates in a tableau the cause of the sequence.	Names the change in the sequence.	Physically recreates in a tableau the change in the sequence.	Names the effect in the sequence.	Physically recreates in a tableau the effect in the sequence.			

**Critical Thinking Self-Assessment Worksheet**

1. Describe an artistic choice you made to show a part of your scientific process: For example: Describe your statue (facial expression and body shape). Identify what level/depth you used. Describe how you used physical and/or eye contact with another actor.

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2. What part of the scientific process did this show? (Cause, change, effect)

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3. Explain why you made that artistic choice to demonstrate that aspect of the scientific process.

I made that artistic choice because \_\_\_\_\_

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**ARTS IMPACT LESSON PLAN Arts Infusion**

*Scientific Sequence Slide Show*

**CLASS ASSESSMENT WORKSHEET**

Disciplines	THEATER AND SCIENCE						THEATER	THEATER AND SCIENCE	Total 8
	Beginning/Cause		Middle/Change		End/Effect		Performance Process	Critical Thinking (21 <sup>st</sup> Century Skill)	
Criteria	Scientific Sequence	Tableau	Scientific Sequence	Tableau	Scientific Sequence	Tableau	Presents, in order, the sequence of the three tableaux (beginning, middle, end). Varies physical choices (face, body and spatial relationships) to show change	Uses evidence to question or explain artistic choices and construct meaning.	
Student Name	Names the cause of the sequence.	Physically recreates in a tableau the cause of the sequence.	Names the change in the sequence.	Physically recreates in a tableau the change in the sequence.	Names the effect in the sequence.	Physically recreates in a tableau the effect in the sequence.			
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Percentage									

*What was effective in the lesson? Why?*

*What do I want to consider for the next time I teach this lesson?*

*What were the strongest connections between theater and science?*

Teacher: \_\_\_\_\_

Date: \_\_\_\_\_

THEATER AND READING LESSON: *Scientific Sequence Slide Show*

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Dear Family:

Today your child participated in an **Arts and Science** lesson in which he/she used critical thinking skills to create three *tableaux* (*frozen stage pictures*) that showed a cause and effect sequence.

- We brainstormed in groups, and determined the cause, change, and effect of a scientific process.
- We identified and physically expressed the main components and actions of the sequence as characters in a tableau (frozen stage picture).
- We used evidence and scientific knowledge to construct meaning of the scientific process through tableau, and to question, support and explain our artistic choices.
- We presented our three tableaux of the sequence of cause, change and effect in a living slide show.

At home, you could make a series of tableaux that express another sequence of events or cause and effect relationship. Use evidence and your knowledge of the sequence or relationship to explain your artistic choices.

**Enduring Understanding**

Cause and effect can be shown through a sequence of actions and reactions.