

## **Butterflies, Beethoven, Botticelli and Ballet: The Power of Interdisciplinary Learning**

### **Overview:**

Sculptures, petri dishes, calculators and paint boxes....what can we learn from connecting the disciplines? In this lesson students explore the power of interdisciplinary learning. They will engage in role-playing activities, conduct Internet research, and work collaboratively to create class presentations.

**Grade Level:** 6-8

### **Subjects:**

Language Arts, Science, Visual Arts, Mathematics

### **Learning Objectives:**

Students will do the following:

- ∞ Engage in role-playing activities
- ∞ Make inferences
- ∞ Make judgments
- ∞ Engage in small group and whole group discussion
- ∞ Analyze and evaluate information from multiple sources
- ∞ Conduct Internet research
- ∞ Create a class presentation

Teacher Note: The goal of this lesson is to demonstrate the power of interdisciplinary connections. These connections can enrich our understanding of concepts and content, and help us think imaginatively and creatively about new ideas. The following [Elliot Eisner](#) quotation describes the underlying pedagogy of this lesson.

Each symbol system -- mathematics, the sciences, art, music, literature, poetry, and the like -- allows us not

only to conceptualize our ideas about reality but also to convey those ideas to others. Each symbol system sets parameters upon what we can conceive and what we can express. Thus, through painting we are able to know autumn in ways that only the visual arts make possible. Through poetry we can know autumn in ways that only poems can provide. Through botany we are able to know autumn in ways that only botanists can convey. How autumn is conceived and hence, what we know about it, depends upon the symbol system we use or choose to use.

-Elliot Eisner

## **Learning Activities**

### **Building Background**

#### **Activity One: Identity Role Play Game**

*The purpose of this activity is to help students understand how to describe objects and events from varied perspectives.*

1. Divide the class into five small groups, each comprised of five students, if possible. Tell the students that each group will be given an opportunity to describe an object from a specific perspective. Explain that after each group member presents his or her object description, the class must guess the identity of the person speaking. Give each group its assigned task.

#### **Group One: Describe a Plant**

Describe a plant. You are a botanist.

Describe a plant. You are a painter.

Describe a plant. You are a kindergarten teacher.

Describe a plant. You are garden center sales clerk.

Describe a plant. You are a photographer.

### **Group Two: Describe Peace**

Describe peace. You are a soldier.

Describe peace. You are a parent of a six-year-old child.

Describe peace. You are a politician.

Describe peace. You are a peace activist.

Describe peace. You are a musician.

### **Group Three: Describe a Building**

You are an architect.

You are a ten year old.

You are a sculptor.

You are an engineer.

You are a historian.

### **Group Four: Describe a Dance Performance**

You are the parent of a ten-year-old child.

You are a ballet dancer.

You are a dance critic for a newspaper

You are a musician.

You are a stage set designer.

### **Group Five: Describe a Holiday Song**

You are a musician.

You are the grandmother of a five-year-old child.

You are a high school science teacher.

You are a poet.

You are a geographer.

Ask two students to tally the students' responses for accuracy.

2. When the groups are finished, lead a class discussion on the activity. Use the following questions to guide the

discussion:

- ∞What was the hardest identity to guess?
- ∞What kind of clues did you notice as each person described his or her assigned object?
- ∞Did you find this task easy or difficult?
- ∞Why do you think we did this activity?
- ∞What did you learn from this activity?
- ∞What does it mean to “think across disciplines”?

## **Steps for Learning**

### **Butterflies Across the Curriculum**

*The purpose of this activity is for students to conduct interdisciplinary research on a topic.*

1. Divide the class into small groups. (Do not use the same groups as you did in the Building Background Activity.) Tell the groups that they are going to conduct Internet research on butterflies from a variety of perspectives. Have each group create a brief presentation sharing what it has learned with the class.

Give each group its respective handout below.

## Group One: A Scientific Perspective

Your task is to describe butterflies from a scientific perspective. You might research questions such as the following:

- ∞What is the anatomy of a butterfly?
- ∞What is the life cycle of a butterfly?
- ∞What role do butterflies play in the environment?

As you conduct your research and create your presentation, try to think about how scientists might describe butterflies. You may wish to use these resources as you begin researching:

- ∞Enchanted Learning  
<http://www.enchantedlearning.com/subjects/butterfly/>
- ∞Butterfly Anatomy  
<http://www.enchantedlearning.com/subjects/butterfly/>
- ∞Yahoo Kids  
<http://kids.yahoo.com/search?p=butterflies&x=0&y=0>

## Group Two: A Poetry Perspective

Your task is to describe butterflies from a poetic perspective. You might research questions such as the following:

- ∞ What kinds of poems have been written about butterflies?
- ∞ How are butterflies described?
- ∞ What kinds of images are evoked in poems about butterflies?

As you conduct your research and create your presentation, try to think about how a poet might describe butterflies.

You may wish to use these resources as you begin researching:

- ∞ Learner.org  
<http://www.learner.org/jnorth/tm/monarch/PoetryDeming.html>
- ∞ Butterfly Haven.com  
<http://www.butterflyhaven.com/indianlegend.htm>
- ∞ Poets.org  
<http://www.poets.org/viewmedia.php/prmMID/15574>

### **Group Three: A Visual Arts and Dance Perspective**

Your task is to describe butterflies from a visual arts and a dance perspective. You might research questions such as the following:

- ∞What kinds of paintings exist that focus on butterflies?
- ∞What colors are used?
- ∞What kinds of dances focus on butterflies?
- ∞How are butterflies used in architecture?

As you conduct your research and create your presentation, try to think about how a visual artist or a dancer might describe butterflies.

You may wish to use these resources as you begin researching:

- ∞North American Butterfly Association  
<http://www.naba.org/chapters/nabast/art.html>
- ∞The Hopi Butterfly Dance  
<http://www.statemuseum.arizona.edu/exhibits/hopisummer/hopisummer2.shtml>
- ∞The Shanghai Oriental Arts Center  
[http://www.chinadaily.com.cn/english/doc/2004-12/30/content\\_404596.htm](http://www.chinadaily.com.cn/english/doc/2004-12/30/content_404596.htm)

## Group Four: A Musical Perspective

Your task is to describe butterflies from a musical perspective. You might research questions such as the following:

- ∞ What kinds of music have been written about butterflies?
- ∞ What kinds of sounds do butterflies evoke?
- ∞ What kinds of lyrics are written about butterflies?

As you conduct your research and create your presentation, try to think about how a musician might describe butterflies. You may wish to use these resources as you begin researching:

- ∞ Smithsonian Institution Global Sound  
<http://www.smithsonianglobalsound.org/trackdetail.aspx?itemid=33662>
- ∞ Shanghai Philharmonic Orchestra  
Butterfly Symphony  
[http://www.naxos.com/catalogue/item.asp?item\\_code=82089#](http://www.naxos.com/catalogue/item.asp?item_code=82089#)  
Click on "About this Recording".
- ∞ The Butterfly Lovers -- Violin Concerto  
[http://www.chinaculture.org/gb/en\\_artqa/2003-09/24/content\\_39969.htm](http://www.chinaculture.org/gb/en_artqa/2003-09/24/content_39969.htm)

## Group Five: A Mathematical Perspective

Your task is to describe butterflies from a mathematical perspective. You might research questions such as the following:

- ∞ How many species of butterflies are there?
- ∞ How many kinds of butterflies are found in the United States?
- ∞ How are butterfly species distributed around the world?
- ∞ How are butterflies counted?

Any information that uses mathematical concepts to describe butterflies may be included in your presentation. You may wish to use the resources listed below to begin your research:

- ∞ Butterflies & Moths of North America  
<http://www.butterfliesandmoths.org/>
- ∞ Enchanted Learning: All About Butterflies  
<http://www.enchantedlearning.com/subjects/butterfly/>
- ∞ Yahoo Kids  
<http://kids.yahoo.com/search?p=butterflies&x=0&y=0>

2. Provide time for the students to share their presentations with their classmates.

3. Lead a class discussion on what one can learn by making connections across disciplines.

Ask the students to brainstorm a list of topics that could be used in interdisciplinary learning projects.

4. Ask the students to choose a topic of interest and create an interdisciplinary presentation based on their research.

Encourage the students to work in pairs or small groups for this project. Invite others in the school or community to view the class presentations.

### **Extension Activities**

#### **Activity One**

1. Have your students conduct independent research on butterfly parks across the world. Invite students to create a class website based on what they have learned.

#### **Activity Two**

1. Invite your students to research the work of interdisciplinary artists such as Meredith Monk. This information may be viewed at

[http://www.nctimes.com/articles/2006/12/11/entertainment/art/14\\_11\\_4112\\_6\\_06.txt](http://www.nctimes.com/articles/2006/12/11/entertainment/art/14_11_4112_6_06.txt).

### **National Education Standards**

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

## **READING**

### **Standard 7.**

Uses reading skills and strategies to understand and interpret a variety of informational texts

<http://www.mcrel.org/compendium/standardDetails.asp?subjectID=7&standardID=7>

### **Level III (Grades 6-8)**

1. Uses reading skills and strategies to understand a variety of informational texts (e.g., electronic texts; textbooks; biographical sketches; directions; essays; primary source historical documents, including letters and diaries; print media, including editorials, news stories, periodicals, and magazines; consumer, workplace, and public documents, including catalogs, technical directions, procedures, and bus routes)

3. Summarizes and paraphrases information in texts (e.g., arranges information in chronological, logical, or sequential order; conveys main ideas, critical details, and underlying meaning; uses own words or quoted materials; preserves author's perspective and voice)

4. Uses new information to adjust and extend personal knowledge base

## **WRITING**

### **Standard 4.**

Gathers and uses information for research purposes

<http://www.mcrel.org/compendium/standardDetails.asp?subjectID=7&standardID=4>

### **Level III (Grade 6-8)**

5. Organizes information and ideas from multiple sources in systematic ways (e.g., time lines, outlines, notes, graphic representations)

## **VISUAL ARTS**

### **Standard 2.**

Knows how to use structures (e.g., sensory qualities, organizational principles, expressive features) and functions of art

### **Level III (Grades 5-8)**

3. Knows how the qualities of structures and functions of art are used to improve communication of one's ideas

## **MATHEMATICS**

### **Standard 9.**

Understands the general nature and uses of mathematics

<http://www.mcrel.org/compendium/standardDetails.asp?subjectID=1&standardID=9>

## **SCIENCE**

### **Standard 12.**

Understands the nature of scientific inquiry

<http://www.mcrel.org/compendium/standardDetails.asp?subjectID=2&standardID=12>

## **WORKING WITH OTHERS**

### **Standard 1.**

Contributes to the overall effort of a group

<http://www.mcrel.org/compendium/Benchmark.asp?SubjectID=22&StandardID=1>

### **Level IV (Grade K-12)**