Great Public Schools for Every Student

Arts Integration in Science

Educator integrates an art form (or forms) into science instruction to increase student learning and engagement.

Key Method

The educator designs a culturally responsive learning experience for students that integrates art forms to make natural connections to science instruction.

Method Components

Arts Integration versus Arts Enhancement

“(Art) enhancement is where the arts are simply supporting the content area but are not being assessed. (Art) integration is where both the art and the content area have objectives and both are being assessed.” —EducationCloset

According to the Kennedy Center for the Performing Arts, arts integration is defined as an “approach to teaching in which students construct and demonstrate understanding through an art form. Students engage in a creative process which connects an art form and another subject area and meets evolving objectives in both.”


Guiding Principles

“While all types of arts-based instruction are encouraged, it is helpful for teachers to know if they are engaged in arts integration. To clarify its distinctive nature, an Arts Integration Checklist is provided. Teachers answering yes to the items can be assured that their approach to teaching is indeed integrated.” —Lynne B. Silverstein and Sean Layne


- Refer to page 9 of the above Kennedy Center linked document for the checklist.

Key Elements of an Arts-Integrated Science Lesson

Following are defining characteristics of an arts-integrated science lesson:

- It includes at least one part of the scientific method: observe, ask a question, form a hypothesis, conduct an experiment, accept hypothesis.
- It includes one of the science process skills: classifying, observing, measuring, inferring, predicting, communicating.
- It contains elements of constructivism.
- Students use their understanding of an art form to make connections to content.
- Students construct and demonstrate understanding through an art form.
- Students create original artwork.
Students revise original artwork.

The artwork created reinforces the content being taught.

The artwork and content connect to one another.

Objectives exist for both the art form and the content.

At least one content standard is addressed.

# Supporting Research


The article discusses the Artful Learning Communities project, which aimed to help elementary and middle school arts teachers to assess learning in the arts, promote student art achievements through assessment, and develop the ability of teachers to systematize their assessment through the use of feedback. The project was supported by the U.S. Department of Education, and 48,000 students in grades 3–8 from schools in South Brooklyn, New York City, took part. The authors suggest that when students had the chance to become their own educators, they were able to show attributes desirable in learners, such as self-teaching and self-assessment.


Arts education in California’s schools has experienced peaks and valleys over the decades, due to budgetary cutbacks and an almost exclusive focus on literacy, mathematics, and science achievement. Gradually, the tide is beginning to turn, and interest in arts education has experienced a resurgence of sorts, resulting from new fine arts requirements at the university level, keen interest in using multiple modalities and intelligences, and research that shows that the arts help better prepare students for college and the workplace. In this article, the author discusses the benefits of arts integration; emphasizes that arts integration requires careful thought, planning, and assessment; and provides an example of a successful collaboration between arts providers, schools, a county office of education, and the University of California in which professional development is provided to educators during an intensive summer institute and a follow-up session during the fall.


[https://books.google.com/books?](https://books.google.com/books?)
Resources

**Articles**

"Defining Arts Integration"

"More Schools Are Working to Integrate the Arts into Classroom Learning"

"How Integrating Arts into Other Subject Areas Makes Learning Come Alive"

"5 Ways to Integrate Expressive Arts Activities into the Middle and High School Classroom"

"Using the Arts to Turn Schools Around"

"Using Expressive Writing to Keep Students Grounded and Engaged in Science Courses"

"Formative Assessment in Arts Education"

"Art Integration: Easy Ideas Combining Science and Art"

"Discovering Science Through Art-Based Activities"

"8 Art Projects that Incorporate Science"
[https://www.theartofed.com/2018/02/06/8-art-projects-incorporate-science/](https://www.theartofed.com/2018/02/06/8-art-projects-incorporate-science/)

"Art Across the Curriculum, Grades 9-12"

"Arts Integration: Resource Roundup"
[https://www.edutopia.org/arts-integration-resources](https://www.edutopia.org/arts-integration-resources)

"15 Ways Art Can Increase Innovation in Your Science Class"

**Videos**

Eric Berridge: Why Tech Needs the Humanities
https://www.ted.com/talks/eric_berridge_why_tech_needs_the_humanities
Liz Coleman: A Call to Reinvent Liberal Arts Education
https://www.ted.com/talks/liz Coleman_s.call_to.reinvent.liberal.arts.education
Mae Jemison: Teaching Arts and Sciences Together
https://www.ted.com/talks/mae_jemison.on.teaching.arts.and.sciences.together
Ken Robinson: Do Schools Kill Creativity?
https://www.ted.com/talks/ken_robinson.says.schools.kill.creativity
Ken Robinson: Changing Education Paradigms
https://www.ted.com/talks/ken_robinson.changing.education.paradigms
Edutopia: Arts Integration for Deeper Learning in Middle School
https://www.youtube.com/watch?v=cPbKUF2zbyw

Teaching Resources
The Kennedy Center—ArtsEdge
http://artsedge.kennedy-center.org/educators/how-to/series/arts-integration/arts-integration
EducationCloset
A Guide for Assessing Classroom Practice of Arts Integration
http://www.njpsa.org/documents/EdLdrsAsSchols/InPractice/ArtsIntegrationSolutionsAssessmentGuide.pdf
Lesson Plans from Crayola
Integrating Arts Learning with the Common Core State Standards
Structuring Summative & Formative Assessment in Visual Art
http://www.jennytiefelarted.com/blog/structuring-summative-formative-assessments-in-visual-art
Digital Narrative Examples
http://www.artsintegrationconsulting.com/resources/documentation-of-student/digital-narrative-examples/
Project Zero (Harvard Graduate School of Education)
http://www.pz.harvard.edu/

Submission Guidelines & Evaluation Criteria

To earn the micro-credential, you must receive a passing score in Parts 1 and 3, and receive a proficient for all components in Part 2.

Part 1. Overview Questions

250 word limit

Please answer the following contextual questions to help our assessor understand your current situation. Please do not include any information that will identify you to your reviewers.
1. Describe the integrated art form and the science standard being taught.
2. Describe how the integrated art form will be culturally responsive to engage learners.
3. Explain your learning goal for this arts integration science lesson.

- **Passing:** Response provides reasonable and accurate information that justifies the reason for choosing this micro-credential to address specific needs of both the teacher and the students. Educator includes a learning goal that describes what they hope to gain from earning this micro-credential.

**Part 2. Work Examples / Artifacts**

To earn this micro-credential, please submit the following **three** artifacts as evidence of your learning. Please do not include any information that will identify you or your students to your reviewers.

**Artifact 1: Arts Integration Science Lesson Plan**

Include:

- Grade level
- Time needed
- At least one science standard
- At least one art standard
- Learning objectives/outcomes
- The key elements listed in the Method Components of this micro-credential
- Lessons that allow students opportunities to make connections between the art and science standards
- Art forms that are integrated in a natural way

**Artifact 2: Documentation of Process**

Select **one** of the following to document the **process** of creating and implementing lessons using art forms that show deep understanding for both the teacher and the learner. (Take care to protect student identity.)

- Upload a two- to four-minute **video** showing a student(s) engaged in artistic expression connecting art to science content. At the beginning of and throughout the video, narrate or display information to explain the learning intended for BOTH the art form and the science standard, as well as the connection to the science content area. (Follow your district’s policy concerning video with students.)
- Share in a photo essay, of at least 10 and no more than 20 slides, student work samples that indicate a deep knowledge of content expressed through an art form. Include text or captions on each slide to guide the assessor. (Follow your district’s policy concerning video with students.)

**Artifact 3: Written Analysis**

Connect your choice in the second option (video or photo essay) to a **written analysis** (600-word limit) that includes the following information:

- The rationale used to inform your instructional practice based on the integration of an art form with science content
- How this lesson supports elements of constructivism
- How this lesson shows how students made connections between the art form and the science content
- How students constructed and demonstrated understanding through an art form
- How students created original artwork
- How students revised original artwork
- How the artwork created reinforces the science content being taught
- How the artwork and content connect to one another
- How the objectives for both the art form and the science content were met
- How the science content standard was met through the art form
<table>
<thead>
<tr>
<th>Plan includes grade level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan includes time needed.</td>
</tr>
<tr>
<td>Plan includes at least one science standard.</td>
</tr>
<tr>
<td>Plan includes at least one art standard.</td>
</tr>
<tr>
<td>Plan includes learning objectives/outcomes.</td>
</tr>
<tr>
<td>Plan includes key elements of an arts-integrated lesson:</td>
</tr>
<tr>
<td>- Elements of constructivism</td>
</tr>
<tr>
<td>- Students use their understanding of an art form to make connections to content</td>
</tr>
<tr>
<td>- Students construct and demonstrate understanding through an art form</td>
</tr>
<tr>
<td>- Students create original artwork</td>
</tr>
<tr>
<td>- Students revise original artwork</td>
</tr>
<tr>
<td>- The artwork created reinforces the content being taught</td>
</tr>
<tr>
<td>- The artwork and content connect to one another</td>
</tr>
<tr>
<td>- Objectives exist for both the art form and the content</td>
</tr>
<tr>
<td>- At least one science content standard is addressed</td>
</tr>
</tbody>
</table>

Lessons allow students opportunities to make connections between the art and science standards.

Art forms are integrated in a natural way.

<table>
<thead>
<tr>
<th>Plan includes grade level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan includes time needed.</td>
</tr>
<tr>
<td>Plan includes at least one science standard.</td>
</tr>
<tr>
<td>Plan includes at least one art standard.</td>
</tr>
<tr>
<td>Plan includes learning objectives/outcomes.</td>
</tr>
<tr>
<td>Content of lessons has vague connections or is not grade-level appropriate.</td>
</tr>
<tr>
<td>Plan includes 6 to 8 of the key elements of an arts-integrated lesson:</td>
</tr>
<tr>
<td>- Elements of constructivism</td>
</tr>
<tr>
<td>- Students use their understanding of an art form to make connections to content</td>
</tr>
<tr>
<td>- Students construct and demonstrate understanding through an art form</td>
</tr>
<tr>
<td>- Students create original artwork</td>
</tr>
<tr>
<td>- Students revise original artwork</td>
</tr>
<tr>
<td>- The artwork created reinforces the content being taught</td>
</tr>
<tr>
<td>- The artwork and content connect to one another</td>
</tr>
<tr>
<td>- Objectives exist for both the art form and the content</td>
</tr>
<tr>
<td>- At least one science content standard is addressed</td>
</tr>
</tbody>
</table>

Lessons allow students opportunities to make connections between the art and science standards.

Art forms are integrated in a natural way.

<table>
<thead>
<tr>
<th>Plan includes grade level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan includes time needed.</td>
</tr>
<tr>
<td>Plan includes at least one science standard.</td>
</tr>
<tr>
<td>Plan includes at least one art standard.</td>
</tr>
<tr>
<td>Plan includes learning objectives/outcomes.</td>
</tr>
<tr>
<td>Plan includes key elements of an arts-integrated lesson:</td>
</tr>
<tr>
<td>- Elements of constructivism</td>
</tr>
<tr>
<td>- Students use their understanding of an art form to make connections to content</td>
</tr>
<tr>
<td>- Students construct and demonstrate understanding through an art form</td>
</tr>
<tr>
<td>- Students create original artwork</td>
</tr>
<tr>
<td>- Students revise original artwork</td>
</tr>
<tr>
<td>- The artwork created reinforces the content being taught</td>
</tr>
<tr>
<td>- The artwork and content connect to one another</td>
</tr>
<tr>
<td>- Objectives exist for both the art form and the content</td>
</tr>
<tr>
<td>- At least one science content standard is addressed</td>
</tr>
</tbody>
</table>

Lessons allow students opportunities to make connections between the art and science standards.

Art forms are integrated in a natural way.

<table>
<thead>
<tr>
<th>Plan is missing 1 or more of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade level</td>
</tr>
<tr>
<td>Time needed</td>
</tr>
<tr>
<td>At least one science standard</td>
</tr>
<tr>
<td>At least one art standard</td>
</tr>
<tr>
<td>Learning objectives/outcomes and/or</td>
</tr>
</tbody>
</table>

Plan includes fewer than 6 of the key elements of an arts-integrated lesson:

- Elements of constructivism |
- Students use their understanding of an art form to make connections to content |
- Students construct and demonstrate understanding through an art form |
- Students create original artwork |
- Students revise original artwork |
- The artwork created reinforces the content being taught |
- The artwork and content connect to one another |
- Objectives exist for both the art form and the content |
- At least one science content standard is addressed and/or |

Lesson may or may not allow students opportunities to make connections between the art and science standards.

and/or |

Art component(s) may or
### Artifact 2: Documentation of Process, Video Option

<table>
<thead>
<tr>
<th>Video includes all points below:</th>
<th>Video includes 3 of the 4 points below:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shows how you know students have gained a deep knowledge of science content expressed through an art form.</td>
<td>Shows how you know students have gained a deep knowledge of science content expressed through an art form.</td>
</tr>
<tr>
<td>Information in video provides examples of the relationship between the science content and the art form.</td>
<td>Information in video provides examples of the relationship between the science content and the art form.</td>
</tr>
<tr>
<td>At the beginning and throughout the video, narration or display of information explains the learning intended for BOTH the art form and the science standard.</td>
<td>At the beginning and throughout the video, narration or display of information explains the learning intended for BOTH the art form and the science standard.</td>
</tr>
<tr>
<td>At the beginning and throughout the video, narration or display of information explains the connection between the art form and the science content area.</td>
<td>At the beginning and throughout the video, narration or display of information explains the connection between the art form and the science content area.</td>
</tr>
</tbody>
</table>

### Artifact 2: Documentation of Process, Photo Essay option

<table>
<thead>
<tr>
<th>Photos document your process creating and implementing your arts-integrated science lesson.</th>
<th>Process is documented but incomplete and missing some components.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art forms documented show deep understanding of the connection between the science content and the art form for both the teacher and the learner.</td>
<td>Photo essay does not contain correct number of photographs.</td>
</tr>
<tr>
<td>At least 10 and no more than 20 photos are included.</td>
<td>Captions do not sufficiently demonstrate process.</td>
</tr>
<tr>
<td>All photos are captioned with complete sentences.</td>
<td>Some or all captions are missing.</td>
</tr>
</tbody>
</table>

Process is not evident.

Photo essay does not contain correct number of photographs, or photos and/or captions are omitted.

Photos are not related to the lesson.
Reflection

500 word limit

Please answer the following reflective questions. Please do not include any information that will identify you to your
1. How will arts integration influence your science teaching practices within your school demographics?
2. How is your arts-integrated science lesson student-centered and celebratory of culturally responsive learning?
3. How will earning this micro-credential in arts integration influence your future science lesson planning?

- **Passing:** Reflection provides evidence that this activity has had a positive impact on both educator practice and student success. Specific examples are cited directly from personal or work-related experiences to support claims. Also included are specific actionable steps that demonstrate how new learning will be integrated into future practices.

Except where otherwise noted, this work is licensed under:
Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)
http://creativecommons.org/licenses/by-nc-nd/4.0/