



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.”

<http://www.kennedy-center.org/education/partners/A1definitionhandout.pdf>

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

http://www.kennedy-center.org/education/partners/defining_arts_integration.pdf

- 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

Andrade, H., et al. (2014). Formative assessment in the visual arts. *Art Education*, 67(1). Retrieved from

<http://connection.ebscohost.com/c/articles/93290484/formative-assessment-visual-arts>

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.

Appel, M. P. (2006). Arts integration across the curriculum. *Leadership*, 36(2), 14-17. Retrieved from

<https://eric.ed.gov/?id=EJ771707>

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.

Ballengee-Morris, C., & Stuhr, P. L. (2015). Multicultural art and visual cultural education in a changing world. *Art Education*, 54(4), 6-13. Retrieved from

<https://www.tandfonline.com/doi/pdf/10.1080/00043125.2001.11653451?needAccess=true>

Chappell, S. V., & Cahnmann-Taylor, M. (2013). No child left with crayons: The imperative of arts-based education and research with language "minority" and other minoritized communities. *Review of Research in Education*, 37(1), 243-268. Retrieved from

<http://journals.sagepub.com/doi/abs/10.3102/0091732x12461615>

Graham, N., & Brouillette, L. (2016). Using arts integration to make science learning memorable in the upper elementary grades: A quasi-experimental study. *Journal for Learning Through the Arts*, 12(1). Retrieved from <https://files.eric.ed.gov/fulltext/EJ1125147.pdf>

Latham, K. (2017). Integrating art into the classroom: a necessary component of a well-rounded education. Honors College Capstone Experience/Thesis Projects, paper 717. Retrieved from

http://digitalcommons.wku.edu/stu_hon_theses/717

Pitts, S. E. (2016). Music, language and learning: Investigating the impact of a music workshop project in four English early years settings. *International Journal of Education & the Arts*, 17(20). Retrieved from

<http://www.artsedsearch.org/study/music-language-and-learning-investigating-the-impact-of-a-music-workshop-project-in-four-english-early-years-settings/>

Winner, E., et al. (2013). *Art for Art's Sake? The Impact of Arts Education*. Organization for Economic Co-operation and Development (OECD).

<https://books.google.com/books?>

Resources

Articles

"Defining Arts Integration"

http://www.kennedy-center.org/education/partners/defining_arts_integration.pdf

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

https://www.washingtonpost.com/local/education/more-schools-are-working-to-integrate-the-arts-into-classroom-learning/2015/10/14/d36c2e64-7201-11e5-8d93-0af317ed58c9_story.html?noredirect=on&utm_term=.138fbabaa639

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

<https://www.kqed.org/mindshift/38576/how-integrating-arts-into-other-subjects-makes-learning-come-alive>

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

<http://www.institute4learning.com/2017/02/08/5-ways-to-integrate-expressive-arts-activities-into-the-middle-and-high-school-classroom/>

"Using the Arts to Turn Schools Around"

http://hepg.org/hel-home/issues/30_2/helarticle/using-the-arts-to-turn-schools-around

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

<https://www.kqed.org/mindshift/50644/using-expressive-writing-to-keep-students-grounded-and-engaged-in-science-courses>

"Formative Assessment in Arts Education"

<https://www.nwea.org/blog/2015/formative-assessment-in-arts-education/>

"Art Integration: Easy Ideas Combining Science and Art"

<https://www.scholastic.com/teachers/blog-posts/meghan-everette/art-integration-easy-ideas-combining-science-and-art/>

"Discovering Science Through Art-Based Activities"

<http://beyondpenguins.ehe.osu.edu/issue/earths-changing-surface/discovering-science-through-art-based-activities>

"8 Art Projects that Incorporate Science"

<https://www.theartofed.com/2018/02/06/8-art-projects-incorporate-science/>

"Art Across the Curriculum, Grades 9-12"

<http://www.nea.org/tools/lessons/Arts-Across-the-Curriculum-Grades-9-12.html>

"Arts Integration: Resource Roundup"

<https://www.edutopia.org/arts-integration-resources>

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

<https://www.weareteachers.com/15-ways-art-can-increase-innovation-in-your-science-class-2/>

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

<https://educationcloset.com/2017/09/27/21st-century-skills-scales-susan-thomas/>

A Guide for Assessing Classroom Practice of Arts Integration

<http://www.njpsa.org/documents/EdLdrsAsSchols/InPractice/ArtsIntegrationSolutionsAssessmentGuide.pdf>

Lesson Plans from Crayola

<https://www.crayola.com/lesson-plans/k-12/science-ecology-and-technology-lesson-plans/>

Integrating Arts Learning with the Common Core State Standards

<http://ccsesa.org/wp-content/uploads/2014/12/FINAL-Common-Core-Publication.compressed.pdf>

Structuring Summative & Formative Assessment in Visual Art

<http://www.artsintegrationpd.org/assessment/>

Digital Narrative Examples

<https://thatsnovel.co.uk/2019/03/19/best-examples-digital-storytelling/>

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

175-250 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.) **Video Tips:** Time stamp specific evidences in your video; video children from the neck down, with instruments blocking faces and/or from the back of head.
- 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
-

null	Proficient	Basic	Developing
<p>Artifact 1: Arts Integration Science Lesson Plan</p>	<p>Plan includes grade level.</p> <p>Plan includes time needed.</p> <p>Plan includes at least one science standard.</p> <p>Plan includes at least one art standard.</p> <p>Plan includes learning objectives/outcomes.</p> <p>Plan includes key elements of an arts-integrated lesson:</p> <ul style="list-style-type: none"> -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 <p>Lessons allow students opportunities to make connections between the art and science standards.</p> <p>Art forms are integrated in a natural way.</p>	<p>Plan includes grade level.</p> <p>Plan includes time needed.</p> <p>Plan includes at least one science standard.</p> <p>Plan includes at least one art standard.</p> <p>Plan includes learning objectives/outcomes.</p> <p>Content of lessons has vague connections or is not grade-level appropriate.</p> <p>Plan includes 6 to 8 of the key elements of an arts-integrated lesson:</p> <ul style="list-style-type: none"> -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 <p>Lessons allow students opportunities to make connections between the art and science standards.</p> <p>Art forms are integrated in a natural way.</p>	<p>Plan is missing 1 or more of the following:</p> <p>Grade level</p> <p>Time needed</p> <p>At least one science standard</p> <p>At least one art standard</p> <p>Learning objectives/outcomes</p> <p>and/or</p> <p>Plan includes fewer than 6 of the key elements of an arts-integrated lesson:</p> <ul style="list-style-type: none"> -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 <p>and/or</p> <p>Lesson may or may not allow students opportunities to make connections between the art and science standards.</p> <p>and/or</p>

Artifact 2:
Documentation of
Process, Video
Option

Video includes all points
below:

Shows how you know
students have gained a
deep knowledge of
science content
expressed through an art
form.

Information in video
provides examples of the
relationship between the
science content and the
art form.

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.
At the beginning and
throughout the video,
narration or display of
information explains the
connection between the
art form and the science
content area.

Artifact 2:
Documentation of
Process, Photo
Essay option

Photos document your
process creating and
implementing your arts-
integrated science
lesson.

Art forms documented
show deep understanding
of the connection
between the science
content and the art form
for both the teacher and
the learner.

At least 10 and no more
than 20 photos are
included.

All photos are captioned
with complete
sentences.

Video includes 3 of the 4
points below:

Shows how you know
students have gained a
deep knowledge of
science content
expressed through an art
form.

Information in video
provides examples of the
relationship between the
science content and the
art form.

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.
At the beginning and
throughout the video,
narration or display of
information explains the
connection between the
art form and the science
content area.

Process is documented
but incomplete and
missing some
components.

Photo essay does not
contain correct number
of photographs.

Captions do not
sufficiently demonstrate
process.

Some or all captions are
missing.

Art component(s) may or
may not be forced and
not naturally tied to
lesson plan.

Video includes fewer
than 3 of the points
below:

Shows how you know
students have gained a
deep knowledge of
science content
expressed through an art
form.

Information in video
provides examples of the
relationship between the
science content and the
art form.

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.
At the beginning and
throughout the video,
narration or display of
information explains the
connection between the
art form and the science
content area.

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.

Artifact 3:
Written Analysis

Analysis contains all the following points:

What was the rationale used to inform your instructional practice based on the integration of an art form with science content

In what ways does this lesson support elements of constructivism

How this lesson shows 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

Grammar, spelling, and sentence structure enhance clear communication.

Analysis contains 7 to 9 of the following points:

What was the rationale used to inform your instructional practice based on the integration of an art form with science content

In what ways does this lesson support elements of constructivism

How this lesson shows 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

Grammar, spelling, and sentence structure allow for clear communication.

Analysis contains fewer than 7 of the following points:

What was the rationale used to inform your instructional practice based on the integration of an art form with science content

In what ways does this lesson support elements of constructivism

How this lesson shows 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

Grammar, spelling, and sentence structure may inhibit clear communication.

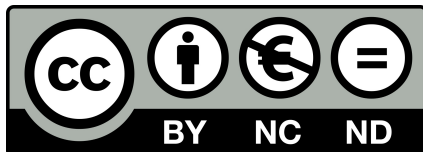
Reflection

400-500 word limit

Please answer the following reflective questions. Please do not include any information that will identify you to your reviewers.

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/>