



Great Public Schools for Every Student

Arts Integration in Mathematics

Educator integrates an art form(s) into mathematics instruction to increase student learning and engagement.

Key Method

The educator designs a culturally responsive learning experience that integrates art forms to make natural connections to mathematics concepts.

Method Components

Arts Integration vs. Arts Enhancement

“Enhancement is where the arts are simply supporting the content area but are not being assessed and 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 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/Adefinitionhandout.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 from the above Kennedy Center linked document.

Key Elements of an Arts Integrated Mathematics Lesson

A successful arts integrated mathematics lesson will include:

- 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 mathematics content standard is addressed

Supporting Research

Andrade, Heidi, et al. *Formative Assessment in the Visual Arts*. Jan. 2014,

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 for learners such as self-teaching and self-assessment.

Appel, Morgan P. "Arts Integration across the Curriculum." *Leadership* 36.2 (2006): 14-17.

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 or 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://eric.ed.gov/?id=EJ771707>

Chappell, Sharon Verner, and Melisa Cahnmann-Taylor. "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 (2013): 243-268.

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

Christine Ballengee-Morris & Patricia L. Stuhr (2015) Multicultural Art and Visual Cultural Education in a Changing World, *Art Education*, 54:4, 6-13, DOI: [10.1080/00043125.2001.11653451](https://doi.org/10.1080/00043125.2001.11653451)

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

Latham, Kate, "Integrating Art Into the Classroom: A Necessary Component of a Well-Rounded Education" (2017). Honors College Capstone Experience/Thesis Projects. Paper 717.

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

Winner, Ellen, et al. *Art for Art's Sake?: The Impact of Arts Education*. Organisation for Economic Co-Operation and Development (OECD), 2013.

[https://books.google.com/books?](https://books.google.com/books?hl=en&lr=&id=YPN_ffgNjrOC&oi=fnd&pg=PA3&dq=Arts+Education+Research&ots=jlUtVl1doW&sig=Ua7E2urz-SKSreYHnjTOWLxjmY0#v=onepage&q=Arts%20Education%20Research&f=false)

[hl=en&lr=&id=YPN_ffgNjrOC&oi=fnd&pg=PA3&dq=Arts+Education+Research&ots=jlUtVl1doW&sig=Ua7E2urz-SKSreYHnjTOWLxjmY0#v=onepage&q=Arts%20Education%20Research&f=false](https://books.google.com/books?hl=en&lr=&id=YPN_ffgNjrOC&oi=fnd&pg=PA3&dq=Arts+Education+Research&ots=jlUtVl1doW&sig=Ua7E2urz-SKSreYHnjTOWLxjmY0#v=onepage&q=Arts%20Education%20Research&f=false)

Resources

Articles

The Kennedy Center – ArtsEdge

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?hpid=hp-local-education%3Aarts%3Ahomepage%2Fstory&hpid=hp-local-education%3Aarts%3Ahomepage%2Fstory

[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](#)

Videos

Math is the Hidden Secret to Understanding the World

[https://www.ted.com/talks/roger_antonsen_math_is_the_hidden_secret_to_understanding_the_world](#)

Liz Coleman's Call to Reinvent Liberal Arts Education

[https://www.ted.com/talks/liz_coleman_s_call_to_reinvent_liberal_arts_education](#)

Mae Jemison on Teaching Arts and Sciences Together

[https://www.ted.com/talks/mae_jemison_on_teaching_arts_and_sciences_together](#)

Ken Robinson Says 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](#)

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](#)

Education Closet

[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](#)

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://artsintegrationconsulting.com/arts-integration-resources/](#)

Project Zero – Harvard University

[http://www.pz.harvard.edu/](#)

Submission Guidelines & Evaluation Criteria

To earn this micro-credential, please submit the following **three** artifacts as evidence of your learning. *Please do not include any information that will make you or your students identifiable to your reviewers. Please check with school district policies before videotaping students.*

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 make you identifiable to your reviewers.

1. Describe the integrated art form and the mathematics 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 mathematics 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. The educator includes a learning goal that describes what they hope to gain from earning this micro-credential.

Part 2. Work Examples / Artifacts

Artifact 1: Lesson Plan

Arts integration mathematics **lesson plan** that includes:

- Grade level
- Time needed
- At least one mathematics standard
- At least one art standard
- Learning objectives/outcomes
- Includes the key elements as listed in the method components of this micro-credential.
- Lessons allow student opportunities to make connections between the art and mathematics standards
- Art forms are integrated in a natural way

Artifact 2: 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 literacy content. Video tips: Video students from the back of the head; with instruments blocking students' faces; video from neck down. Narrate or display information to explain the learning intended for BOTH the art form and the mathematics standard, as well as the connection to the literacy content area at the beginning of and throughout the video. Video tip: Add a timestamp to indicate specific criteria. (follow your district-mandated permissions for video with students).
- Share in a photo essay, with 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-mandated permissions for photography with students).

Artifact 3: Written Analysis

Connect your choice in the second option (video or photo essay) to a **written analysis** (450-600 word limit) that includes the following information:

- The rationale used to inform your instructional practice based on the integration of an art form to mathematics content
- In what ways this lesson supports elements of Constructivism
- How this lesson shows how students made connections between the art form and the mathematics 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 mathematics content being taught

- How the artwork and content connect to one another
- How the objectives for both the art form and the mathematics content were met
- How the mathematics content standard was met through the artform

null	Proficient	Basic	Developing
Artifact 1: Lesson Plan	<p>Plan includes grade level, time, at least one math standard, at least one art standard, and learning objectives/outcomes</p> <p>Lessons are grade- level appropriate</p> <p>Plan also includes all of the key elements (listed in the Method Components section) of an arts integrated lesson</p>	<p>Plan includes most but not all of the following: grade level, time, at least one math standard, at least one art standard, and learning objectives/outcomes</p> <p>Lessons may or may not be grade-level appropriate</p> <p>Plan includes 6 to 8 of the key elements (listed in the Method Components section)</p> <p>Lessons allow student opportunities to make connections between the art and mathematics standards</p> <p>Art forms are integrated in a natural way</p>	<p>Plan is missing most or all of the following: grade level, time, at least one math standard, at least one art standard, and learning objectives/outcomes</p> <p>Plan includes less than 6 of the key elements (listed in the Method Components section)</p> <p>Lesson may not allow student opportunities to make connections between the art and mathematics standards</p> <p>Art component(s) may be forced and not naturally tied to lesson plan</p>
Artifact 2: Process: Video Option	<p>Video includes all points below:</p> <p>Shows how you know students have gained a deep knowledge of mathematics content expressed through an art form</p> <p>Information in video provides examples of the relationship between the mathematics content and the art form</p> <p>Narration or display of information to explain the learning intended for BOTH the art form and the mathematics standard is at the beginning and throughout the video</p> <p>Narration or display of information to explain the connection between the art form and the</p>	<p>Video includes 3 of the 4 points below:</p> <p>Shows how you know students have gained a deep knowledge of mathematics content expressed through an art form</p> <p>Information in video provides examples of the relationship between the mathematics content and the art form</p> <p>Narration or display of information to explain the learning intended for BOTH the art form and the mathematics standard is at the beginning and throughout the video</p> <p>Narration or display of information to explain the connection between the art form and the</p>	<p>Video includes less than 3 points below:</p> <p>Shows how you know students have gained a deep knowledge of mathematics content expressed through an art form</p> <p>Information in video provides examples of the relationship between the mathematics content and the art form</p> <p>Narration or display of information to explain the learning intended for BOTH the art form and the mathematics standard is at the beginning and throughout the video</p> <p>Narration or display of information to explain the connection between the art form and the</p>

	<p>mathematics content area is at the beginning and throughout the video</p>	<p>mathematics content area is at the beginning and throughout the video</p>	<p>mathematics content area is at the beginning and throughout the video</p>
Artifact 2: Process: Photo Essay Option	<p>Photos show documentation of your process creating and implementing your arts integrated mathematics lesson</p> <p>Art forms documented show deep understanding of the connection between the mathematics content and the art form for both the teacher and the learner</p> <p>At least 10 and no more than 20 photos</p> <p>All photos are captioned with complete sentences</p>	<p>Process is documented but incomplete and missing some components</p> <p>Photo essay does not contain correct number of photographs</p> <p>Captions do not sufficiently demonstrate process</p> <p>Some or all captions are missing</p>	<p>Process is not evident</p> <p>Photo essay does not contain correct number of photographs or photos and/or captions are omitted</p> <p>Photos are not related to the lesson</p>
Artifact 3: Written Analysis	<p>Analysis contains all of the following points:</p> <p>The rationale used to inform your instructional practice based on the integration of an art form into mathematics content</p> <p>Ways this lesson supports elements of constructivism</p> <p>How this lesson shows how students made connections between the art form and the mathematics content</p> <p>How students constructed and demonstrated understanding through an art form</p> <p>How students created original artwork</p> <p>How students revised original artwork</p> <p>How the artwork created reinforces the mathematics content being taught</p>	<p>Analysis contains 7 to 9 of the following points:</p> <p>The rationale used to inform your instructional practice based on the integration of an art form into mathematics content</p> <p>Ways this lesson supports elements of constructivism</p> <p>How this lesson shows how students made connections between the art form and the mathematics content</p> <p>How students constructed and demonstrated understanding through an art form</p> <p>How students created original artwork</p> <p>How students revised original artwork</p> <p>How the artwork created reinforces the mathematics content being taught</p>	<p>Analysis contains fewer than 7 of the following points:</p> <p>The rationale used to inform your instructional practice based on the integration of an art form into mathematics content</p> <p>Ways this lesson supports elements of constructivism</p> <p>How this lesson shows how students made connections between the art form and the mathematics content</p> <p>How students constructed and demonstrated understanding through an art form</p> <p>How students created original artwork</p> <p>How students revised original artwork</p> <p>How the artwork created reinforces the mathematics content being taught</p>

<p>How the artwork and content connect to one another</p> <p>How the objectives for both the art form and the mathematics content were met</p> <p>How the mathematics content standard was met through the artform</p> <p>Grammar, spelling, and sentence structure enhance clear communication</p>	<p>How the artwork and content connect to one another</p> <p>How the objectives for both the art form and the mathematics content were met</p> <p>How the mathematics content standard was met through the artform</p> <p>Grammar, spelling, and sentence structure allow for clear communication</p>	<p>How the artwork and content connect to one another</p> <p>How the objectives for both the art form and the mathematics content were met</p> <p>How the mathematics content standard was met through the art form</p> <p>Grammar, spelling, and sentence structure may inhibit clear communication</p>
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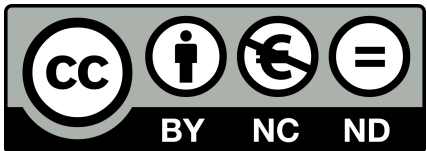
Reflection

400-500 word limit

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

- 1. How will arts integration influence your mathematics teaching practices within your school demographics?
- 2. How is your arts integrated mathematics lesson student-centered and celebratory of culturally responsive learning?
- 3. Explain how earning this micro-credential in arts integration will influence your future mathematics 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.



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