



Arts Integration in Mathematics

Competency

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



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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

Components of Culturally Responsive Teaching

- Educators acknowledge and incorporate students' cultural heritages within instruction.
- Educators recognize the benefits of culturally responsive education in improving students' academic achievement.
- Local environment, community, students, and families are recognized as resources when creating art and learning opportunities, cultivating a place-based learning environment. Students are encouraged to take active roles in their learning.

Practices of Culturally Responsive Instruction

- Educator reflects on personal attitudes and belief systems as they relate to different cultures.
- Educator utilizes different levels of culture to integrate and enhance classroom art instruction and integration.
- Different levels of culture include:
 - Surface—observable (i.e., music, food, dress,)
 - Shallow—social interactions
 - Deep—morals, spirituality, health
- Educator supports students in taking greater ownership for their learning.
- Educator provides authentic learning opportunities.

Art Instruction

- Shows students that art is a universal form of expression (i.e., everyone can make art).



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- Offers students opportunities to express their own creativity through art.
- Helps students construct and demonstrate understanding through an art.

Supporting Rationale and Research

Andrade, Heidi, et al. *Formative Assessment in the Visual Arts*. Jan. 2014, https://drive.google.com/file/d/1ZysFTbK_kN7bkWx5vNrDU6kI3PyJel9J/view?usp=sharing 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.

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.

Retrieved from

<https://www.edpolicyinca.org/newsroom/no-child-left-crayons-imperative-arts-based-education-and-research-language-minority-and>

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>

(use alternate access options and a free account to read)

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

https://drive.google.com/file/d/12cCFRb3RO5UBpNxJL_ofoMNF-mXOnG3i/view?usp=sharing



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Resources

Articles

[The Kennedy Center – ArtsEdge](#)

[Art for Art's Sake?](#)

[More schools are working to integrate the arts into classroom learning](#)

[How Integrating Arts into Other Subject Areas Makes Learning Come Alive](#)

Video

[Eric Berridge: Why Tech Needs the Humanities](#)

[Liz Coleman: A Call to Reinvent Liberal Arts Education](#)

[Mae Jemison: Teaching Arts and Sciences Together](#)

[Ken Robinson: Do Schools Kill Creativity?](#)

[Ken Robinson: Changing Education Paradigms](#)

[Edutopia: Arts Integration for Deeper Learning in Middle School](#)

Teaching Resources

[The Kennedy Center—ArtsEdge](#)

[Education Closet](#)

[A guide for assessing classroom practice of arts integration](#)

[Integrating Arts Learning with the Common Core State Standards](#)

[Project Zero – Harvard University](#)



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Digital Narrative Examples

[5 Digital Storytelling Assignments in the Classroom](#)

[7 of the Best Examples of Digital Storytelling](#)

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 (Provides Context)

175 - 250 words

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. Educator includes a learning goal that describes what they hope to gain from earning this micro-credential.

Part 2. Work Examples/Artifacts/Evidence

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.*

Artifact 1: Lesson Plan

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

- Grade level



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- 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 math content. Narrate or display information to explain the learning intended for BOTH the culturally relevant art form and the mathematics standard, as well as the connection to the math content area at the beginning of and throughout the video (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 a culturally relevant 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 words) 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
- In what ways this lesson supports cultural competency of the students



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Part 2. Rubric

	Proficient	Basic	Developing
Artifact 1: Lesson Plan	<p>Plan includes grade level, time, at least one math standard, at least one art standard, a connection to a student's own or others' culture, 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 <u>6 to 8</u> 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 <u>less than 6</u> 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 <u>all</u> points below:</p> <p>Shows how you know students have gained a deep knowledge of mathematics content expressed through an art form</p>	<p>Video includes <u>3 of the 4</u> points below:</p> <p>Shows how you know students have gained a deep knowledge of mathematics content expressed through an art form</p>	<p>Video includes <u>less than 3</u> points below:</p> <p>Shows how you know students have gained a deep knowledge of mathematics content expressed through an art form</p>



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	<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, culture, and the mathematics content area is at the beginning and throughout the video</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 mathematics content area is at the beginning and throughout the video</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 mathematics content area is at the beginning and throughout the video</p>
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<p>Artifact 2: Process: Photo Essay Option</p>	<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 , culture, 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>
<p>Artifact 3: Written Analysis</p>	<p>Analysis contains <u>all</u> 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</p>	<p>Analysis contains <u>7 to 9</u> 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</p>	<p>Analysis contains <u>fewer than 7</u> 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</p>



	<p>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>Ways this lesson supports cultural competence</p>	<p>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 <u>allow</u> for clear communication</p>	<p>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 art form</p> <p>Grammar, spelling, and sentence structure <u>may inhibit</u> clear communication</p>
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	Grammar, spelling, and sentence structure <u>enhance</u> clear communication		
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Part 3 Reflection

(350 - 500 words)

Use the word count as a guide to write a personal reflection about your work on this micro-credential. For tips on writing a good reflection review the following resource:

[How Do I Write a Good Personal Reflection?](#)

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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