



A guide for assessing
classroom practice
of arts integration

Assessment Guide



Assessment Guide

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Professional development, School program development, Sustainable practice

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About Arts Integration

What is Arts Integration?

Arts Integration is the use of the arts to increase students' learning in math, science, literacy and other academic subjects.

Low income kids who participate in arts education are 4 times more likely to have high academic achievement and 3 times more likely to have high attendance than those who didn't.

- report from the President's Committee on the Arts and Humanities 2011

Arts integration techniques, that use multiple senses, cause more information to be stored in long-term memory (rather than short-term) and potentially change the structure of neurons.

- report from the President's Committee on the Arts and Humanities 2011

Arts integration reaches all students in every classroom, including the lowest performing learners, and raises test scores without narrowing the curriculum.

79% of teachers say arts integration "totally changed teaching"

- report from the President's Committee on the Arts and Humanities 2011

94% of teachers gained "additional ways of teaching critical thinking skills" through arts integration

- report from the President's Committee on the Arts and Humanities 2011

Arts Integration is creating understanding... by empowering teachers to use the arts to engage students... in project-based, experiential learning

How does AiS approach arts integration?

- AiS creates learning through the arts that DOES include explicit experiences in math, science, reading, and writing.

- AiS measures learning that has the most impact on the value of a successful education experience by individual students

- AiS is assessing teacher's practice of arts integration in the classroom and linking it to student outcomes.

- AiS provides professional development to help teachers to learn to use the arts (with or without artists).

What if the arts could enable every young person to succeed in school...

How does arts integration practice work in the classroom?

Teachers trained in arts integration embed the arts in their classroom lessons in all academic subjects. The arts are used to introduce, support, reinforce, and assess learning.

What is the role of artists?

Artists are trained as mentors to share their artistic process and art form with teachers, collaborating in the preparation and presentation of lessons in the classroom.

What results can arts integration achieve?

- Test scores increase
- Classroom engagement intensifies
- Teacher effectiveness increases
- 21st century life skills are developed
- Students' innate abilities are unleashed
- Creativity permeates each subject

Who is using arts integration?

Arts integration programs exist in schools across the country, and arts integration is used in many classrooms by individual teachers. Arts Integration Solutions is dedicated to supporting a deep level of academic rigor in arts integration practice and in sharing the best resources with schools, individual teachers and artists.

Arts Integration is a solution...

- school-wide reform
- teacher empowerment
- a strategy for engaging all students

Who is Arts Integration Solutions (AiS)

Arts Integration Solutions is a nonprofit organization whose mission is to reform the education system by bringing the classroom practice of arts integration to every child, in every classroom, every day; helping them succeed in math, science, literacy . . . and life.



Assessment for best practices in arts integration

Introduction

What if the core of school transformation centered around the development of imagination and creative thinking? What if students viewed school as a place to uncover and discover the link between concepts in core subjects like math, science and language arts by fully engaging in artistic processes that build understanding and promote flexible thinking, invite perspective, and encourage them to make insightful connections through constructing understanding of complex ideas? What if assessment is skillfully aligned with standards that promote and reinforce learning as a process that embodies the cognitive, social, emotional, and physical aspects of growth? And what if each of these dimensions is given equal consideration because all students come to the table with different strengths that are built upon to make learning a fully engaging and transferable experience? The arts integration solution to school transformation is in the connections for inquiry between the arts and Core Standards and Concepts. Give educators the tools through arts integration to mindfully discover myriad connections they offer to transform their classrooms into rich learning environments.

...merging
the arts with
content
learning in
the class-
room
through
mindful
instructional
practice...

What is Arts Integration?

Arts Integration is the process of merging the arts with content learning in the classroom through mindful instructional practice that engages students in learning. It is the process of using multi-faceted strategies which, when used effectively, have been scientifically proven to engage a wide range of learners and advance mastery of all concepts.

Arts Integration Solutions operates from the belief that the learning process is cyclical, and in order to deepen one's understanding of how K-12 students engage in the arts as a means for facilitating academic content learning, educators must themselves understand the art forms as well as the transformative process of arts integration. When teachers are empowered to build their own expertise in the arts they bring that perspective to their collaborative work with students; they inspire students to explore their world through an artistic lens where the connections between content and the arts unfold.

A student who shows a solution to a math problem in a drawing, or communicates the same problem in movement or sound has achieved a mastery of concept far beyond the paper and pencil calculation. A classroom teacher who takes advantage of opportunities for students to show what they know, feel and perceive through visual art, music, dance and theater activities has the opportunity of developing students with inquisitive minds, emotional balance, and an ability to engage in higher forms of thought process through inquiry based learning. Furthermore, the arts infused classroom has an advantage of using individual learning styles effectively in creating projects that validate each student's contribution as well as teaching the important values of collaboration and cooperation. Arts integrated classrooms and schools have a climate of happy, engaged and energetic students as well as more satisfied teachers, parents and administrators!

Why is arts integration vital for use in our school curricula?

Students all arrive in the classroom with a unique set of characteristics and faculties including natural abilities in visual and performing arts. True education allows individuals to explore their human potential in multiple areas. All art forms have historical and cultural roots and connections. An added bonus for educators is that the arts foster and encourage critical thinking, reasoning, and inquiry. Visual and performing arts can be connected to almost every curricular area. For example, artists and musicians can use patterning, proportion, and perspective when connecting to higher mathematical function. Imaginative exploration of art works leads to critical and creative thinking and writing; dance often is intrinsically connected to geometry; music fosters literacy development by building understanding of symbolic representation of ideas; theatre invites perspective and builds empathy. Working with the arts encourages abstract thought and expression, freeing the mind to explore multiple angles and solutions to any problem.

...education
allows
individuals
to
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multiple
areas...

What is the Arts Integration Assessment Guide?

The Arts Integration Solutions' Arts Integration Assessment Guide is designed to help the teacher understand and navigate the arts integration assessment process by articulating clear goals for student learning that effectively integrate the arts with academic content in the process of facilitating transformational learning in the classroom.

This guide is organized to help you understand the foundational model of arts integration and how it applies to your arts integration assessment practice. It highlights possible considerations you may encounter in assessment, questions around which to frame your reflective practice, and ways to develop student meta-cognitive development through arts integration practice. These guidelines help assess the needs of your student and mandated standards, while strongly maintaining the integrity of the arts and arts integration as it relates to academic content. The appendix to this guide provides vignettes and sample rubrics with the intent of providing a model from which you can build your own arts integration assessment tools that are aligned with both your curricular and student learning outcomes.

Outline

The Arts Integration Cycle

The Tenets of Arts Integration

Student Standards and Outcomes for Arts Integration Practice

Arts Integration Rubric

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Middle grades integrated science-visual art lesson example

Student Self-Assessment Rubric

Conclusion

Resources

The Arts Integration Cycle

The Arts Integration Cycle was developed to illustrate a set of considerations in the arts integration process. The five phases identified each inform the other in a cyclical process that together serve as a reference for the planning and practice of arts integrated lessons in the classroom. This process guides the user through perspectives on arts integration which we believe are vital to the integrity and power of the arts in academic achievement.

Understanding Self and the Creative Process The process of learning about arts integration begins with understanding oneself, and the learning process. How do I arrive as an educator? What prior knowledge, skills and experience do I bring to my arts integration practice? How does one go about learning? What types of learning styles and needs exist in a classroom? How does what we know about learning and the brain facilitate arts integration? How does understanding one's own learning needs facilitate the arts integration process in the classroom?

Environment: The Learning Zone This stage of the arts integration cycle promotes understanding of how a learning environment facilitates the arts integration process by consciously building a strong community; one in which students are willing to take healthy risks in learning in order to explore their creative process. What structure and community do I engage in with my students? What leadership skills do I desire to build within my students? How can I foster an environment where students supportively challenge one another and celebrate their unique strengths as learners?

Foundational knowledge In order for arts integration practitioners to feel comfortable facilitating learning experiences in all of the arts, time must be spent building foundational knowledge in all of the arts and in arts integration practice. When teachers, and teaching artists have foundational background, the learning connections for students are much stronger, as elements of the arts are woven into understanding complex ideas in the academic content areas. What possible approaches might I take in employing arts integration in my classroom? Are there areas of art with which I am more comfortable? Are there areas in the arts where I would like to grow? What support do I need to grow my foundational knowledge?

Strategies and Tools for Engaging in the Learning Process Once a foundation has been established, the arts integration practitioner can begin using multiple strategies to facilitate learning in all areas of the arts integration cycle. Strategies engage students in active learning that explores content in a way that directly involves students in building their own understanding of content. How do I build a toolbox of arts integration strategies to increase inquiry, engagement and rigor? How do I implement arts integration strategies to develop and strengthen arts integration practice?

Integrated Experience and Reflection Allowing arts integration practitioners to reflectively engage in integrated arts experiences is a springboard to examining one's own curriculum, and exploring the layers of learning that can be embedded into academic and art content by simultaneously using both in the learning process. What can I build from this experience, from that of my students, from our reflections on what worked and why? What impact does reflecting on my teaching through assessment have on the arts integration process?

The Arts Integration Cycle



The Tenets of Arts Integration

Arts integration, at its most robust, academic-based, effective practice, is formed by a set of beliefs or principles that define its integrity. We have made (and continue to make) great effort to identify the driving principles that guide the kind of arts integration that truly transforms learning experiences for students and teaching experiences for teachers. These beliefs are the tenets of arts integration. The tenets occur in multiple iterations of the cycle. They are not intended to be hierarchical. They serve as guidelines to inform arts integration practice and foster the growth of educational communities that serve children as future leaders in our culture.

Engagement: Arts integration facilitates personal motivation to learn through problem solving, and strengthens best practices in teaching as a result of increased student investment.

Collaboration: Participation in arts integration practice promotes learning partnerships that evolve through respectful relationships that value the strengths of each individual.

Agility: Learners are engaged in rigorous arts integration practice that teaches flexibility, embraces change, and invites multiple perspectives.

Knowledge Construction: Arts integration is relevant to the learner as it promotes and supports the use of critical thinking skills and inquiry.

Congruence: Effective arts integration practice upholds deliberate alignment between academic content and the arts.

Integrity: Mindful synthesis of arts and content learning promotes best practices in arts integration, which hold true to the art form(s).

Insight: Best practices in arts integration embrace the symbiotic relationships between ideas, content and the arts.

Skillful assessment: Mindfully designed authentic evaluation of content, process and product in arts integration ensures that all levels of learning are synthesized, transferred and applied through art to relevant and related academic concepts.

Resiliency: Arts integration learning experiences foster healthy risk-taking through personal growth, transformation, and empowerment.

Visionary Leadership: Confident leadership, demonstrated through collaboration, communication, and consistency, facilitates arts integration practice that is transformational to a learning community.

Student Standards and Outcomes for Arts Integration

What are student standards and outcomes for arts integration practice?

The Standards and Outcomes for Arts Integration are guidelines for educators and students that are based on the Arts Integration cycle. The standards are broad ideas about the types of experiences participants should be engaged in at each phase of the cycle to produce a specific outcome that leads to best practice in arts integration. As educators design instruction, these standards and outcomes are intended as a guide and should be in conjunction with content standards, which best fit the overall goals of instruction, and are carefully aligned to reflect congruence between the arts and content. Overall, these standards and outcomes are intended to provide a framework for the transformation we hope teachers and students experience as a result of their engagement in the arts integration process. The Tenets of Arts Integration, noted in italics, are applied to specific outcomes under each standard.

- Standards lead to outcomes
 - Outcomes are built on standards

- **Understanding Self and the Creative Process:** Students participate in experiences that elucidate the benefits and purposes of arts integration to begin the path toward becoming lifelong learners.
 - Students engage in experiences that promote understanding of their personal strengths and potential through the creative process (*resiliency*)
 - Understanding of the self is the foundation for building life skills within the arts integration environment (*resiliency, visionary leadership*)
 - Students possess multiple ways of learning and develop flexibility in their use in learning environments (*engagement*)
 - Arts integration fosters (suggestion – encourages) learning through addressing multiple learning styles and needs (*engagement, agility, insight*)
 - Students explore the benefits of arts integration through the Tenets of Arts Integration (*integrity*)

- **Environment/ The Learning Zone:** Students develop the capacity for engaging in healthy risk-taking experiences that promote building community prior to focusing on content in arts integration practice.
 - Students engage in healthy-risk taking experiences that foster the creative process (*resiliency*)
 - Students understand the nature of interdependence within a community.
 - Students recognize the inherent value of building community through engagement in arts integration practice (*collaboration, visionary leadership*)
 - Students develop a knowledge base that supports their ability to lead within a community (*visionary leadership, collaboration*)

- **Foundational Knowledge:** Students experience the transformative power of building literacy in the arts to deepen understanding of content.
 - o Students gain confidence in foundational arts knowledge (*resiliency, knowledge construction*)
 - o Students participate in arts integration experiences while developing integrity to art forms (*integrity, agility, insight*)
 - o Students challenge themselves to strengthen knowledge, skill and comfort level within the art form(s) (*resiliency, knowledge construction, integrity, agility*)
 - o Students recognize and explain the point of integration expressed in their work of art (*congruence*)
- **Strategies and Tools for Engaging in the Learning Process:** Students use strategies and tools that promote and foster learning through arts integration.
 - o Students engage in learning experiences that utilize strategies for integrating the arts and content learning (*agility, knowledge construction, inquiry*)
 - o Student utilize strategies for inquiry and problem-solving in the arts integration process (*knowledge construction, insight, agility*)
 - o Students build understanding of content through problem-solving and inquiry in arts integration practice (*knowledge construction*)
 - o Students reflect on the use of tools and strategies for arts integration as a means for content learning (*agility, knowledge construction, skillful assessment*)
- **Integrated Experience and Reflection:** Students synthesize their practice of arts integration through reflection and assessment which promotes clear congruence between content and the arts.
 - o Students engage in reflective practice that identifies the impact of Arts Integration on their achievement in the content areas (*rigor, leadership, skillful assessment*)
 - o Students use authentic assessment as a means for measuring their learning (*skillful assessment, congruence*)
 - o Students use authentic assessment to understand transference of knowledge (*rigor, skillful assessment, congruence*)
 - o Students reflectively engage in arts integration that promotes strong communication, consistency and unity in the classroom and school community (*leadership*)

Assessment in Arts Integration

What is assessment in arts integration?

Assessment in arts integration reflects the rigorous expectations and criteria demanded of both learner and facilitator. It defines clear criteria for assessing student learning that deliberately aligns with parallel concepts that connect arts and content learning across disciplines.

Why is assessment in arts integration important for accountability?

In this fast-paced technology driven world we can no longer assess student learning from a black and white dichotomy. Assessment, like educational practice has to reflect the world in which we live, a complex multifaceted, challenging one and therefore it **MUST** authentically account for what we are teaching. Accountability ensures we are reflective practitioners.

Arts integration for the sake of engaging in the arts is meritorious. However it is critical to demonstrate accountability by articulating clear criteria for assessment that demonstrates student achievement in all content areas through the practice of arts integration.

How does assessment inform the arts integration practice?

Assessment in arts integration practice strives to authentically measure the learning achievement of the student as it is demonstrated through understanding of arts concepts that are applied to content learning. Arts integration practice assessment, like other forms of assessment, needs to be specific and measurable but must ultimately be evidence based. Arts integration practice assessment is often peer, teacher and self-generated using broad, open-ended, performance based measures that fosters reflective practice in connection to the arts through examination of content, process and product.

When does assessment occur in the Arts Integration Cycle?

Assessment of student learning in the arts integration classroom is an ongoing cyclical process that begins with the identification of clear instructional goals, observing and responding to student needs during instruction, and engaging in student and teacher generated reflection throughout the duration of the learning experience. While assessment measures will occur at various points within the learning and teaching process, they are dependent on multiple variables including needs of the learner or teacher for feedback, the assessment is summative or formative, and if the assessor is the student, teacher or peer. Best practice in arts integration assessment assures that articulation of criteria for success is appropriate for the learning experience and that the teacher is a reflective practitioner who is responsive to student needs throughout the learning cycle.

How do I begin to assess student learning and my own arts integration practice?

Assessment in arts integration practice begins with asking: “How can I use arts integration to deepen my students’ understanding of core concepts that I teach in my curriculum?” A suggestion would be to start with a lesson or unit of study that the teacher is most familiar with and in which he or she sees the opportunity to use the arts to deepen student risk-taking, engagement, and knowledge construction. The classroom teacher resource guide provides multiple support strategies and ideas for creating rich arts integration lessons or units of study. Once those lesson or unit goals have been defined and established, the natural progression into assessment occurs through the examining arts and content learning criteria.

The following rubric combines the Arts Integration Cycle and the Tenets of Arts Integration through a lens that explores content, process and product. It is intended to be a framework that is modifiable by the arts integration practitioner based on the following factors:

- The goals and objectives of the unit of study based on careful selection of the content, process or product standards that are most applicable to the learning
- The student and teacher’s level of experience on the arts integration practice continuum
- The content and arts integration outcomes that have the greatest potential for demonstrating student achievement as a result of the arts integration process

Following the rubric are two vignettes designed to illustrate ways arts integration assessment potentially could occur at the elementary and middle school levels. Note: the teachers of both lessons have taken the arts integration rubric and modified it to specify learning criteria based on specific National Academic Content and Arts Standards that would be applicable to their unit goals.

How will the assessment cycle inform my arts integration practice and facilitate significant learning and transfer of content knowledge for my students?

The traditional paradigm of an incentive based learning system no longer serves our students in a world that demands creative solutions to the problems of a global society (Pink, 2011). If we teach our students that there is one right and one wrong solution that is in front of them, we are hindering their ability to apply 21st century learning skills to solve problems.

Three characteristics of classroom assessment that support creativity are: engaging in complex tasks, designing evaluation activities to move students more toward self evaluation and providing criteria for feedback as source for meta-cognitive growth (Starko, 2010). Assessment isn’t just about being a reflective practitioner, it is about finding ways to build students’ cognitive conceptual abilities where multiple solutions and outcomes can occur for a particular problem. And if we are reflective in the assessment both of ourselves as teachers and our students as learners, we will find ways to make learning tasks more rigorous, more engaging, to involve greater risk taking and foster more abstract thinking. We must allow our students to construct meaning through the natural experiential processes that are facilitated through engagement in the arts during learning.

Arts Integration Rubric

	Content	Process	Product
4	<ul style="list-style-type: none"> • Student work demonstrates clear understanding of the academic standard(s) through accurate representation • Student work demonstrates clear understanding of the arts standard(s) through accurate representation 	<ul style="list-style-type: none"> • Student work/performance clearly demonstrates significant growth in use of inquiry and higher order thinking skills • Student work/performance demonstrates significant risk-taking • Student is highly reflective of his/her growth through the arts integration process • Student clearly strives to build community through collaborative work 	<ul style="list-style-type: none"> • The outcome of student work clearly reflects congruence between the arts and content goals for the project • The student self assessment clearly demonstrates increased awareness of relevance and purpose of the arts integration process
3	<ul style="list-style-type: none"> • Student work mostly demonstrates understanding of the academic standard(s) through mostly accurate representation • Student work mostly demonstrates understanding of the arts standard(s) through mostly accurate representation 	<ul style="list-style-type: none"> • Student work/performance mostly demonstrates growth in use of inquiry and higher order thinking skills • Student work/performance demonstrates some risk-taking • Student is mostly reflective of his/her growth through the arts integration process • Student participates in community building through participating in collaborative work 	<ul style="list-style-type: none"> • The outcome of student work mostly reflects congruence between the arts and content goals for the project • The student self assessment mostly demonstrates increased awareness of relevance and purpose of the arts integration process
2	<ul style="list-style-type: none"> • Student work demonstrates minimal understanding of the academic standard(s) through somewhat accurate representation • Student work demonstrates minimal understanding of the arts standard(s) through somewhat accurate representation 	<ul style="list-style-type: none"> • Student work/performance demonstrates a minimal amount of growth in use of inquiry and higher order thinking skills • Student work/performance demonstrates a minimal amount of risk-taking • Student is somewhat reflective of his/her growth through the arts integration process • Student participates somewhat in community building through minimal participation in collaborative work 	<ul style="list-style-type: none"> • The outcome of student work reflects minimal congruence between the arts and content goals for the project • The student self assessment demonstrates minimal awareness of relevance and purpose of the arts integration process
1	<ul style="list-style-type: none"> • Student work does not demonstrate an understanding of the academic standards and/or is not able to accurately represent understanding • Student work does not demonstrate an understanding of the arts standards and/or is not able to accurately represent understanding 	<ul style="list-style-type: none"> • Student work/performance does not demonstrate use of inquiry and/or higher order thinking skills • Student work/performance does not demonstrate risk-taking • Student is not reflective of his/her growth through the arts integration process • Student does not participate in community building and/or collaborative 	<ul style="list-style-type: none"> • The outcome of student work does not reflect art and content goals • The student does not self-assess and or does not demonstrate any awareness of relevance of the arts integration process

Elementary science lesson example

The following vignette is an example of a lesson that uses content, process and product to introduce third graders to the concept of a machine as a tool for making work easier. The teacher uses movement, sound and the visual arts as a means for allowing students to problem solve in groups and individually to conceptualize machines prior to learning about inclined planes, levers, wheels & axles, and pulleys. At the culmination of the unit, students will build a “machine” with three of the elements listed above. The vignette is designed to illustrate a possible learning experience that immerses students in building understanding of a new concept. It is an idea that is most certainly modifiable based on the population of students one is working with and the desired learning outcomes.

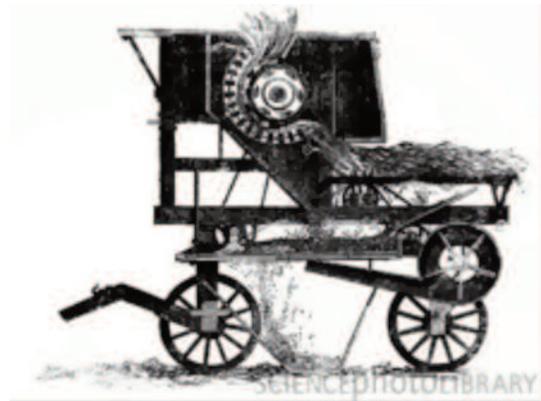
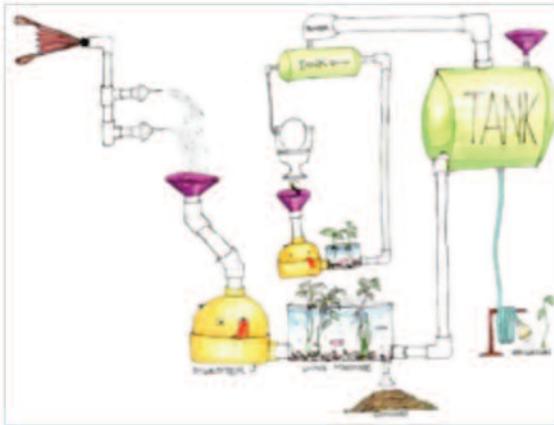
Lawrence is introducing a unit about simple machines for his third graders. His goal is for his students to utilize movement, sound and the visual arts to solve a problem that illustrates the concept of a machine as a tool for making work easier.

Lawrence begins in the first lesson by asking them to work in groups to design a machine with their bodies that has the purpose of making some kind of work easier. Criteria for the machine is that it must have sound and body movement, resulting in a visual, auditory kinesthetic demonstration of an idea that solves a problem by making work easier and includes every member of the group as a functioning part of the machine. Machines are presented in a way that allows other students to try to discern what their machine is doing and discuss what problem is being solved, as well as how this is represented with sound and movement. The machine is demonstrated a second time by each group after discussion and explanation of the machine’s purpose. Culminating discussion is guided by questions that are aligned with the standards, prompting students to discuss how they solved problems through the use of movement, sound and space and connected it to an idea in science that solves a problem.

Students are then asked to imagine that they are inventors who have all of the materials at hand they need and they will be thinking of a problem they would like to solve and design a machine of their own, guided by the scientific principal that machines make work easier. Examples of machines are brainstormed, such as Henry Ford inventing the car for more efficient transportation, a food processor being developed to make chopping, grinding or mixing food faster and easier, a computer being invented to make written and visual communication faster and easier. (Links to visual diagrams are listed in resources)

Students are given graph paper, rulers, colored pencils and asked to draw a diagram of a machine they could invent that would make some kind of work easier. Instrumental background music is played while students work on their ideas. Students are encouraged to use the whole space to design their machine with visualizing moving parts, name the machine, and label the parts with captions if desired.

Machine diagrams are shared and discussed using the standards and attached rubric as a guide for addressing both science and arts standards. Students are assessed by examining their understanding of science content, the inquiry and problem-solving processes both in science, movement and visual arts. Lawrence uses the tenets of engagement, collaboration and knowledge construction to guide the arts integration process with his students, and to pose questions before, during and after the lesson.



Lawrence is interested in assessing student understanding of the purpose of a machine to solve a problem. In addition, he is using formative assessment to evaluate student use of the arts as a means for problem solving and visualizing the new concept they are working with. He modified the Arts Integration Rubric to include standards that identify specific criteria for content, process and product that are linked to using the arts as a means for understanding and expressing an idea. At the end of the presentations and student sharing of machine diagrams, Lawrence uses the Rubric to develop the following questions to guide his students in reflecting on the two experiences and make formative decisions about how he will progress with the unit. The Tenets of Arts Integration that guide these questions are listed in parentheses:

- What is a machine and how does it help solve a problem?
(*knowledge construction*)
- How did working together in a group help you to make a decision about choosing a problem to solve and creating a machine? (*collaboration*)
- How did the group activity help you to understand how the parts of a machine work together to make work easier? (*collaboration, knowledge construction*)
- How did the group machine help you to understand and ask questions that helped you to design your own machine on paper? (*knowledge construction*)
- How did the group machine and the diagram drawing help you to understand what machines do? (*knowledge construction*)
- What do you know about machines after this activity that you didn't know before? (*knowledge construction*)
- How did the arts help you to solve a problem? (*knowledge construction, engagement, collaboration*)
- How would you describe your level of focus and interest in this project?
(*engagement*)

Lawrence's own personal reflective questions after this might be:

- What did I learn about students from listening to their ideas, observing their group and individual work and viewing their machine diagrams? (*insight, engagement, collaboration*)
- How did their work meet the criteria articulated on the rubric? (*congruence, integrity, skillful assessment*)
- How can I use this information about student understanding of the rubric criteria to make decisions about what will happen next in the unit? (*skillful assessment*)
- How will I connect the concepts students learned today to student learning as we progress through this unit? (*congruence, integrity*)
- How might I increase the rigor with my students as we progress into the unit? (*agility*)
- What means of formative and summative assessment will best inform me about how well students meet the criteria articulated in the standards and my rubric? (*skillful assessment*)
- What did I learn about student collaboration for solving a problem and fostering risk taking with this lesson? (*resiliency*)
- How did the use of the arts cultivate a learning environment that encourages risk-taking, community-building, and student engagement? (*resiliency*)
- How might I modify my rubric to make a stronger connection between the standards and the unit outcomes, as well as the process of arts integration? (*skillful assessment*)

Arts Integration Rubric: Elementary science example: Problem solving and simple machines

	Content	Process	Product
4	<ul style="list-style-type: none"> • Student work demonstrates clear understanding of a machine as a tool for solving a problem (NS K-4.5) • Student work demonstrates clear understanding of how properties of objects and materials can work together in sequence to solve a problem (NS K-4.2) • Student work clearly demonstrates a connection between visual arts and science (NA-VA.K-4.6) 	<ul style="list-style-type: none"> • Student work/performance clearly demonstrates significant growth in use of inquiry and higher order thinking skills by solving a problem and analyzing the process (NA-D.K-4.4, NA-M.K-4.3) • Student group work demonstrates clear understanding of realizing multiple solutions to a given problem through movement (NA-D.K-4.4) • Student work/performance demonstrates significant risk-taking (NS.K-4.7, NA-M.K-4.3) • Student is highly reflective of his/her growth through the arts integration process (NA-VA.K-4.2) • Student clearly strives to build community through collaborative work (NA-D.K-4.4) 	<ul style="list-style-type: none"> • The outcome of student work clearly reflects congruence between the arts and science as a human endeavor. (NS.K-4.7) • The student self assessment clearly demonstrates increased awareness of relevance and purpose of the arts integration process (NS.K-4-4.2, NA-VA.K-4.2, NA-VA.K-4.6, NA-VA.K-4.7)

National Science Standards: As a result of the activities in grades K-4, all students should develop an understanding of:

NS.K-4.2 Physical Science:

- Properties of objects and materials
- Position and motion of object

NS.K-4.5 Science and Technology:

- Abilities of technological design
- Understanding about science and technology

NS.K-4.7 History and Nature of Science:

- Science as a human endeavor

National Dance Standards

NA-D.K-4.4 Applying and demonstrating critical and creative thinking skills in dance

- Students explore, discover and realize multiple solutions to a given movement problem; choose their favorite solution and discuss the reasons for their choice

NA-D.K-4.7 Making Connections between dance and other disciplines:

- Students create a dance project that reveals understanding of a concept or idea from another discipline (such as pattern in dance and science)

National Visual Arts Standards

NA-VA.K-4.2 Using knowledge of structures and function:

- Students use visual structures to communicate ideas

NA-VA.K-4.6 Making connections between visual arts and other disciplines:

- Students identify connections between the visual arts and other disciplines in the curriculum

National Music Standards

NA-M.K-4.3 Improvising melodies, arrangements and accompaniments

- Students improvise short songs and instrumental pieces, using a variety of sound sources, including traditional sounds (e.g., voices, instruments), nontraditional sounds available in the classroom (e.g., paper tearing, pencil tapping), body sounds (e.g., hands clapping, fingers snapping)

Middle grades integrated science-visual art lesson example

The following vignette is designed to serve as an example of a lesson that uses content, process and product to teach physics concepts to students through the integration of visual art. This is meant to indicate some of the kinds of assessment questions and thoughts that guide a teacher in the creation of one possible form of arts integration assessment. Naturally, this may be modified in any way that suits the needs of the teacher, the objectives and goals, and the student community.



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Sonora is faced with the challenge of teaching physics to 8th graders. In the past, Sonora has noticed students struggling with certain concepts. Recognizing that her students learn better when they are kinesthetically engaged in the creation process, she's determined to use visual art as the entry point for students to demonstrate their content, process, and product knowledge of physics. Sonora shares a framework for the unit and where they'll be going with it, including the rubric she'll be using for assessing student learning. Students then study artist Alexander Calder, the creator of the very first mobile, who dreamed of showing the motion on the universe through his sculpture. Using physics concepts of kinetic energy, force, fulcrum, mass and momentum, students are exposed to Alexander Calder's artistic influences and the ways in which he demonstrated these concepts in visual art.

Students, working in pairs or small groups, must design a mobile that has three levels of pivoting or turning parts in which the parts turn completely in a 360 degree rotation, is balanced both physically and visually, and demonstrates their understanding of force, fulcrum, mass, momentum, and kinetic energy. They use wire, wire cutters, needle-nose pliers, paper, paint, and any other material available to them. During an in-progress critique, students share their mobiles with another group and elicit feedback. Using the feedback received during the critique process, students return to the studio to continue refining their mobiles.

This process takes Sonora and her students about four days. At the conclusion of their studio creation, students share their mobiles with the large group, noting their challenges, the problem-solving in which they engaged, the discoveries they made, etc. Students are assessed in terms of content (both science and art content knowledge), process (including their collaboration), leadership, risk-taking, engagement and higher-order thinking skills, and finally in the product (the mobile and students self-assessment).

The assessment of this lesson must include both formative and summative kinds of questions and criteria. In essence, Sonora is interested in determining not only the connections made between physics and art through Alexander Calder's work, but additionally, the ways in which the students built community as they collaborate, problem-solving skills used and shared among the community, their use of higher order thinking skills specifically in the kinds of questions they ask themselves as they synthesize the physics and art content in their mobile creation, the evidence of leadership within the small group and the larger group critique, how the students engaged in inquiry and the rigorous connection to physical science concepts demonstrated through the product of their mobiles. The Tenets of Arts Integration that guide these questions are listed in italics:

Some guiding questions Sonora might use in the formative and summative assessment of her students include:

- In what ways did Alexander Calder use the concepts of physics in his sculptures? (*knowledge construction*)
- What might Calder have learned as he made the transition from stationary to mobile sculpture? (*insight*)
- How did your group work together to solve the physics problems? (*agility, collaboration*)
- What challenges did you encounter and overcome? (*resiliency, engagement*)
- What evidence does your work show that demonstrates your new understanding of the links between motion, force and art? (*knowledge, skillful assessment*)
- How did the arts and the process of creating your sculpture help you solve physics problems? (*insight, congruence, knowledge construction*)
- Describe the discoveries you made in terms of the connections between the fields of art and science? (*congruence, insight, knowledge construction*)

Sonora's own personal reflection questions following the unit might include:

- What did I learn from this experience about creating an environment that fosters student collaboration and risk taking? (*skillful assessment, insight*)
- How did the student work demonstrate congruence between the arts and science? (*congruence, integrity, skillful assessment*)
- How might I increase the rigor in future lessons? (*insight*)
- In what ways did I see an increase in student engagement? (*skillful assessment, resiliency*)
- How did the experience of implementing physics concepts through an art form change the students understanding and support their awareness of integration? (*integrity, insight*)
- Where do I go next with arts integration? (*visionary leadership*)
- What support do I need as I move forward in my arts integration practice? (*collaboration, insight, resiliency*)

On the next page, you'll find a rubric that Sonora might create by adapting the more generic Arts Integration Rubric to fit the specifics needs of her objectives and outcomes.

Arts Integration Rubric: Middle grades integrated science example: physics and art

	Content	Process	Product
4	<ul style="list-style-type: none"> • Student work demonstrates clear understanding of motions and forces (NS.5-8.2) • Student work demonstrates clear understanding of the process of scientific inquiry (NS.5-8.1) • Student work demonstrates clear understanding of how Alexander Calder influenced visual characteristics of sculpture (NA-VA.5-8.4) • Student work clearly demonstrates a connection between visual arts and science (NA-VA.5-8.6) 	<ul style="list-style-type: none"> • Student work/performance clearly demonstrates significant growth in use of inquiry and higher order thinking skills by identifying and controlling variables, exploring relationships between evidence and explanations, and analyzing the process (NS.5-8.1) • Student group work demonstrates clear understanding of realizing multiple solutions to a given problem through visual art structures and functions (NA-VA.5-8.2) • Student work/performance demonstrates significant integration of visual, spatial, and temporal concepts with content to communicate intended meanings in artwork (NA-VA.5-8.3) • Student work/performance demonstrates significant risk-taking(NS.5-8.7) • Student is highly reflective of his/her growth through the arts integration process (NA-VA.5-8.6) • Student clearly strives to build community through collaborative work (NA-VA.5-8.5) 	<ul style="list-style-type: none"> • The outcome of student work clearly reflects congruence between the arts and science as a human endeavor (NS.5-8.2) • The student self assessment clearly demonstrates increased awareness of multiple purposes for creating works of art (NA-VA.5-8.5) • The student self assessment clearly demonstrates relevance and purpose of the arts integration process (NA-VA.5-8.6)

Arts Integration Cycle Student Self-Assessment Rubric

	Exemplary	Highly Skilled	Competent	Developing
Understanding Self and the Creative Process	I participate in and reflect on learning experiences that increase my ability to understand myself through the creative process and make meaningful connections to my growth as a learner.	I participate in and reflect on learning experiences that increase my ability to understand myself through the creative process.	I participate in learning experiences that increase my ability to understand myself through the creative process.	I sometimes participate in learning experiences that increase my ability to understand myself through the creative process.
Environment/Learning Zone	I lead and support my peers in stretching their ability to take healthy risks while learning through arts integration practice	I lead and support my peers in building community in my classroom during the process of learning through arts integration practice	I am a strong participant in my classroom community during the process of learning through arts integration practice.	I am a participant in my classroom community during the process of learning through arts integration practice.
Foundational Knowledge	I challenge myself to set goals for personal growth while participating in new learning that builds my understanding of art and other subjects. I reflect on this new learning and can discuss how I have grown personally.	I challenge myself to set goals for personal growth while participating in new learning that builds my understanding of art and other subjects.	I participate in new learning that builds my understanding of art and other subjects.	I am not yet comfortable participating in new learning that builds my understanding of art and other subjects.
Strategies and Tools for Engaging in the Learning Process	I engage in learning new strategies and tools in arts integration and apply them by asking questions and seeking multiple solutions to problems that I encounter while learning.	I engage in learning new strategies and tools in arts integration and apply them by asking questions that help me to better understand what I am learning.	I engage in learning new strategies and tools for arts integration.	I participate somewhat in learning new strategies and tools for arts integration.
Integrated Experience and Reflection	In my reflection about my learning through arts integration I see connections between art and other subjects and ways in which that affects my classroom and community.	In my reflection about my learning through arts integration I see connections between art and other subjects.	I reflect on my learning through arts integration.	I participate in arts integration, but don't always think about my own learning.

Conclusion

As we have demonstrated through the vignettes and rubrics, assessment in arts integration should move beyond traditional pencil and paper assessment to become engaging assessment practice that truly measures students' transferrable experiences. This process allows teachers to become more reflective about their own instructional practice as well as where they see students making valuable connections between content and the arts. Students begin to view learning in a different light; education now becomes relevant as a tool for self-evaluation, and for examining their learning through different lenses.

Our intent is for this guide to support you in facilitating your students' growth in arts integration practice through assessment. Recognizing that fundamental to the process of supporting your students' growth, is reflecting on your own teaching. Therefore you will find another tool; the Arts Integration Practitioner Self-Reflection Rubric, which is designed to support you in your arts integration journey.

Resources

A few Alexander Calder links and supporting information that may support Sonora:
www.calder.org

Youtube video of Alexander Calder's Circus at the Whitney Museum
www.youtube.com/watch?v=t6jwnu8lzy0
<http://www.nga.gov/exhibitions/calder/realsp/roomenter-foyer.htm>

Pink, Daniel (2005) *A whole new mind: Why right brainers will rule the future.*
New York: Riverhead/Penguin Books

Starko, Alane (2010) *Creativity in the classroom: Schools of curious delight.* 4th edition.
Routledge: New York.

Music source: Deep Breakfast. Ray Lynch, 2001 Ray Lynch Productions

Machine images:

- <http://www.sciencephoto.com/media/362963/enlarge>
- http://jellobrain.com/files/images/lm_appt.jpg

Reinvesting in Arts Education: Winning America's Future Through Creative Schools,
The President's Committee on the Arts and Humanities,
www.pcah.gov/sites/default/files/PCAH_Reinvesting_4web_0.pdf

