Evelyn Mariano

Arts Integration Portfolio

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Experience

Art Teacher, The Clear View School, Briar Cliff Manor, NY - 1999-Present
Providing art instruction to special needs students in pre-k through 12th grade in a day treatment setting. Implementing Arts Integration cooperatively with classroom teachers and STEM teacher. Coordinating Artists in Residencies and purchasing supplies.

Special Education Teacher, Greenburgh 11 UFSD, Dobbs Ferry, NY 1997-1999
Planned organized and implemented lessons for adolescent students with emotional and learning disabilities in a departmentalized setting.

Art Teacher - Summer School, Birchwood School, West Nyack, NY 1994-1997
Planned, organized and implemented art activities and art therapy sessions for students with emotional disabilities in grades k-12.

Teaching Assistant, Birchwood School, West Nyack, NY - 1992-1997
Implemented individualized education programs for special education classes at both the elementary level and for adolescent students with emotional and learning disabilities. Member of the Site Based Management Committee engaging in cooperative and shared decision-making with the purpose of improving student performance. Substituted for various teaching positions on an as needed basis.

Program Director, Pearl River School Aged Child Care - 1992-1995
Planned, organized and implemented activities in an after school setting. Responsible for employee supervision and purchasing supplies.

Education
EducationCloset.com Arts Integration Specialist Certification Program 2018
St. Thomas Aquinas College, Sparkill, New York - M.S. in Special Education 1997
St. Thomas Aquinas College, Sparkill, New York - B.A. in Art Education k-12 and Art Therapy 1991

Certifications
Arts Integration Specialist - EducationCloset.com
New York State Permanent Certification in Special Education
New York State Permanent Certification in Art k-12
New Jersey State Certificate in Art k-12

References available upon request

My Philosophy

I believe in helping all students to be the best that they can be. To help them succeed no matter their background or what their special needs may be. The Arts and creativity provide a means to facilitate this success. Providing instruction to students through a collaboration of the arts and content areas, where standards are meaningfully aligned and taught simultaneously has shown to be an effective way to allow for easy and natural differentiation of instruction to meet the needs of all students at all levels. I believe in using Arts Integration to make learning fun, provide a positive educational environment and to help students to make connections to real world situations. Arts Integration helps students to strengthen their 21st century skills such as creative thinking, critical thinking, collaboration, and communication among others.

My experiences as a teacher over the years have led me to work with a wide variety of students with a wide variety of abilities and a wide variety of coursework. I have not only taught visual art classes but have taught math, reading, writing, and even some science and social studies. It is these experiences that always lead me to look for connections between the academics and the arts. I am always willing to work with content area teachers to make our program the best that it can be. I look forward to bringing Arts Integration to the forefront of educational programs.

Look-Fors, Behaviors and Expectations in An Arts Integrated Classroom

We look for an Arts Integrated Classroom to

- Be visually appealing and showcase student work and success.
- Be arranged so that conversations and collaboration are encouraged.
- Teach lessons in and through the arts.
- Have standards in the arts and content areas meaningfully aligned and equitably assessed.
- Be a place where creative experiences are encouraged and used to develop critical thinkers and problem solvers.

Behaviors we want to see in an Arts Integrated Classroom

- Students are actively engaged in learning.
- There is collaboration between students and between teachers.
- 21st Century Skills are being developed.
- Students are encouraged to lead activities.
- Students are making connections to real world situations.

In an Arts Integrated Program we expect

- Teachers to participate in professional development in Arts Integration throughout the year.
- Arts teachers and content area teachers to work collaboratively in planning and teaching.
- Students will engage in respectful behavior during interactions, collaboration and in using materials.
- Teachers and students will take risks during learning in a safe place.
- Students to engage in a creative process connecting an art form with a content area and meeting the objectives of both equitably.
- Students to have the opportunity to publish work outside of the classroom.

Sample Arts Integration Lesson Plans

Science and Visual Art

Teacher(s) Evelyn Mariano
Unit/Lesson: Cells and Their Parts
Grade(s): 5-8
Duration: 4-5 30 minute sessions

Integration of	21st Century Skills
Science Visual Art	Critical Thinking Creative Thinking Communicating Social Skills
Content Standards	**Art Standards**
Science 1.1c Most cells have cell membranes, genetic material, and cytoplasm. Some cells have a cell wall and/or chloroplasts. Many cells have a nucleus.	VA:CR.2.1.4 Explore & invent art making techniques & approaches. Process: Creating Anchor Standard: Organize & develop artistic ideas and work.

Essential Questions
What does it mean to magnify? What do we see when we take a closer look? How can you create a visually appealing representation of a cell and all its parts?

Key Vocabulary	Arts Concepts	Materials
Magnify, organelles, cell, membrane, wall, cytoplasm, nucleus, chloroplast, balance, emphasis, perspective, structure, compose, microscope, proportion, scale	Create Perform/Produce/Present	Cell artwork, STW chart, microscopes, prepared slides of animal & plant cells, cell sketch handout, pencils, erasers, 8x10 drawing paper, colored pencils, written reflection handout

Lesson Sequence (Overview of activities, concepts, etc.)	Assessments
Students will observe a painting of a cell and use the s/t/w strategy. Students will learn to use a microscope and observe sample animal & plant cells and sketch the cells and their parts. Students will choose one of the cells they viewed and create a detailed artistic drawing of that cell with all of its parts.	• • Formative: rough sketch of cells from observation, teacher led questioning • Summative: written reflection, cell illustration with parts in correct scale and proportion • Performance: sharing of finished illustration and verbal description of work • Summative: Rubric

Instructional Delivery (guided, collaborative, and self directed)

Student Learning Outcomes:

- Students will use a microscope to observe cell structure of plant and animal cells.
- Students will be able to name the parts of a cell.
- Students will note differences in plant and animal cells.
- Students will explore colored pencil techniques.
- Students will complete a well organized artwork of a cell that reflects their understanding of an animal or plant cell and its parts.

Pre-Engagement:

Have a fine art piece that was inspired by a cell displayed at the front of the room. A good example is, *Cell No. 14* by Angela Canada Hopkins found at https://angelacanadahopkins.com/a5qs8u0ri2n6arkjgesjl2peu1y9dj . Use the See-Think_Wonder strategy (see attached handout) to introduce the students to this artwork. Have them work silently and independently for 2 to 3 minutes and write down what they see. Have the students share what they see as a class. Then, have them list what they think and what they wonder. Questions that can be used to explore the image are:

- What is the media used in this painting?
- What does the artist emphasize?
- What kind of balance is used? (symmetrical, asymmetrical, radial)
- The teacher will discuss the visual aspects of a cell: cell wall, cell membrane, nucleus, chloroplasts, shapes and relative size.

Focal Lesson:

Part 1

- Teachers will model how to use the microscope with various slides. Review the parts of a microscope and how to use them properly.
- Students will work in pairs to view 2 unlabeled slides (1 animal cell and 1 plant cell) Students will sketch a rough draft of what they see and must include the size, organelles, and hypothesize what cell they see in each slide using the handout available.
- Students will gather and share their observations with teacher guidance. At this point, the teacher will review the parts of a cell and discuss the differences between animal and plant cells.

Part 2

- Teachers will demonstrate some basic colored pencil techniques. Students will explore the use of colored pencils independently.
- Students will be instructed to use one of their cell drawings to create a piece of art based on either an animal cell or a plant cell with all of its parts in correct proportion and scale. Students will use colored pencil techniques to complete these drawings. Students will be sure to create a visually pleasing and well organized artwork that takes into account balance, perspective and good use of the medium.

Assess and Extend

Students will present their work to the class one at a time. Classmates will hypothesize which type of cell is represented in the artwork. Students will also critique the artwork in relation to use of proportion and balance. Students will then describe to the class what their own drawing represents.

Specific reflection questions for use in class discussion:

- When you drew your rough draft, how did the microscope help you?
- Why is perspective important when turning your cell into a piece of art?
- How is the artistic process of creating a piece of art similar to the scientific process of examining a specimen?
- Tell me about your organelles. How did you know this was the cell wall? Membrane? Nucleus? Etc.
- What do you notice about the shapes of these organelles?
- Do you notice any similarities between the job of a scientist and the job of a visual artist?

Students will individually complete the Written Reflection Form. (see attached form)

Extension: Students can explore how individual cells are connected in relation to each other. In a similar fashion, they can explore how a quilt is made, block by block, and create a large scale artwork by piecing their cells together in a similar manner.

Differentiation

Students can view the prepared slides online to accommodate individual needs. Teachers and assistants will be available to help and supervise students as needed.

Students who need extra time will be provided that time as deemed necessary by teachers.

For students who are above level or finished quickly they can create an additional artwork of a cell on a smaller scale.

Reflection Opportunities

Student Reflections: Key questions to ask students

- What part of the lesson was challenging for you?
- What was the most interesting part of the lesson?

Teacher reflection: Key questions to ask yourself

- Was there a seamless connection between the art and science in the lesson?
- What pieces of this lesson were a challenge?
- Which pieces were the most engaging for student/teacher?
- What would you do differently?

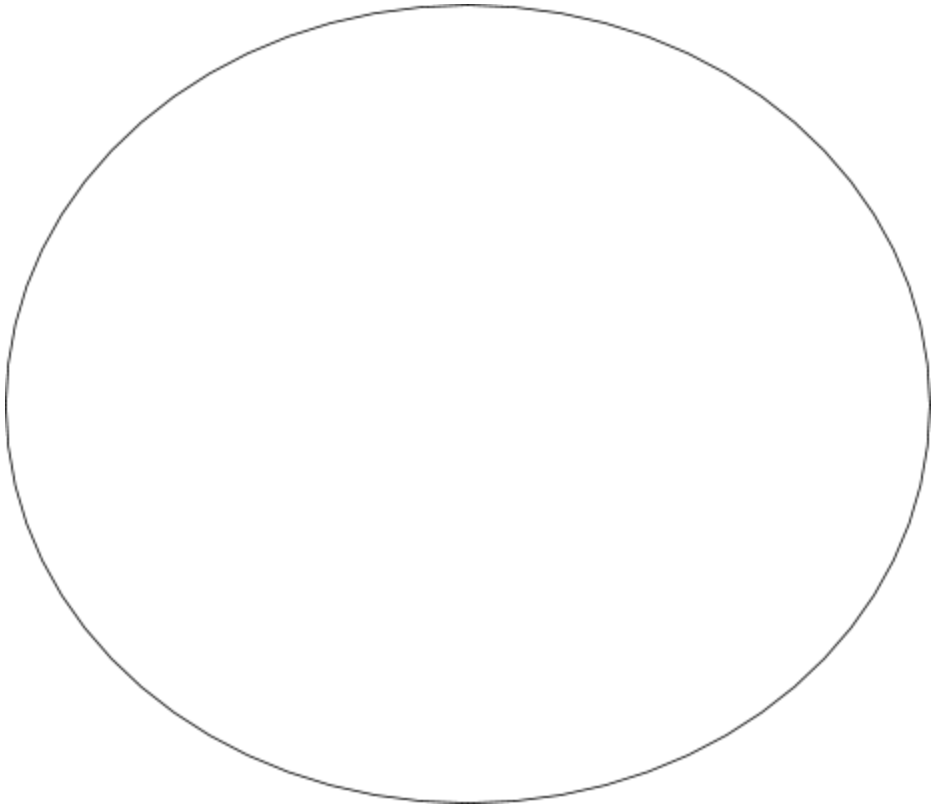
See Think Wonder

 I see...	 I think...	 I still wonder...

Name _____Class_____Date_____

Cell Sketch Worksheet

Perspective drawing must completely fill the view as seen in the microscope.



Name_____Class_____Date_____

Written Reflection - Cell Drawing

1.When you drew your sketches, how did the microscope help you?

2. How is the artistic process similar to the scientific process of examining a specimen?

3. Do you notice any similarities between the job of a scientist and the job of a visual artist?

Cell Drawing - Rubric

	3	2	1	0
Organization	Cell parts are accurately rendered, well placed and organized throughout the page.	Cell parts are accurately rendered and are well placed and organized with only some crowding and less that 2 mistakes.	Cell parts are rendered but are disorganized and with 2 to 4 mistakes.	Cell parts are disorganized with many mistakes or there was no drawing produced.
Labeling Cell Parts	All cell parts are labeled accurately with no mistakes.	Cell parts are labeled with only 1 mistake.	Cell parts are labeled with several mistakes.	Cell parts are not labeled.
Colored Pencil Technique	Drawing shows high attention to detail in using colored pencil. There is a variety of colors that are very well blended with no bare spots or smudges. It is meticulous.	Drawing shows attention to detail in using colored pencil. There is a variety of colors that are well blended with few bare spots or smudges.	Drawing shows some attempt at using colored pencils. There are few colors and very little blending with several bare spots and smudges.	The drawing is not colored in or is just scribbled over.

ELA and Visual Art

An Arts Integrated PBL Lesson

Project Overview	
Project Title: Colors and Feelings.	**Duration:** 6-8 sessions
Teacher: Evelyn Mariano	**Grade Level:** 3
Content Area: ELA	**Integrated Content:** Visual Art
Project Description: Students will learn about books and illustrators and how they contribute to and create subject matter, characteristics and mood. They will read and analyze *My Many Colored Days* by Dr. Seuss paying particular attention to how color is used to portray mood. Working as a class (or in small groups) students will create a book addressing how behaviors can affect others feelings and using color to portray the feelings. Each student will create a page with an illustration that will be assembled into a published book. A plan will be formulated on how to use the finished book within our school community. When the book is completed it will be presented at a reception for invited guests from the school community.	
Driving Question(s): How can we use books and illustrations to help our school community build empathy and compassion for each other?	

Content Standard	Integrated Content Standard
ELA- CCSS.ELA-Literacy,RL3.7 Explain how specific aspects of a text's illustrations contribute to what is conveyed by the works in a story. (eg: create mood, emphasize aspects of a character or setting)	**Visual Art** VA:Re8.1.3a Interpret art by analyzing use of media to create subject matter, characteristics of form, and mood.

Instruction
Performance Objectives: *What must all students know and be able to do as a result of this PBL experience.* Students will be able to explain how illustrations convey mood, emphasize characters and settings, or create subject matter.
Evidence of Success: *How will you know students have successfully achieved objectives and standards?* Students will have successfully achieved objectives and standards when they have completed and published their book and presented it at a

reception to an audience of invited guests and are able to speak about how they completed their work as well as to discuss how using the book will help our school community to build empathy and compassion for each other.
Entry Event: *Describe how you will engage students and introduce the projects driving question.* Using close looking, a section of a painting that displays strong emotion will be displayed and a See-Think-Wonder strategy used. After all have completed the strategy the full painting will be displayed and analyzed. This should also be done with a second painting representing a different emotion/mood and created with another type of media. Sample paintings used will be Edvard Munch, *The Scream*, Pablo Picasso, *The Weeping Woman*, Jim Dine, *The Circus*, Mark Rothko, *Orange, Red, Yellow*.
Content Lessons: *Identify any content on which you will provide instruction or embed learning activities.* ● Provide lessons & opportunities to explore books and illustrations. ● Provide direct instruction on color theory and opportunities to explore how colors can represent emotions. ● Provide direct instruction on empathy and compassion. ● Provide opportunities to explore how we can build empathy and compassion for others.

Resources: *Identify any resources, personnel, or materials you will need.*

School-Based resources *(people & facilities)*	***Technology*** *(websites, apps, presentation tools)*	***Materials*** *(publications, manipulative, supplies)*	***Community*** *(partners, speakers, experts, helpers)*
art teacher - myself classroom teacher(for writing the story) Therapist (discussing empathy and compassion)	computer and/or monitor to display images or PowerPoint presentation	*My Many Colored Days* by Dr. Seuss Artwork -(posters or powerpoint presentation) Edvard Munch, *The Scream*, Pablo Picasso, *The Weeping Woman*, Jim Dine, *The Circus*, Mark Rothko, *Orange, Red, Yellow*. Art supplies - paper,pencils, erasers, paints, crayons, colored pencils	

Assessment and Reflection

21st Century Skills: *Will these be explicitly taught and assessed, or simply encouraged?*	**Formative Assessment Tools**	**Summative Assessment Tools**
Assessment (If applicable)	Quizzes/Tests	Written Product (rubric)
Collaboration	Journaling/Learning Logs	Oral presentation (rubric)
Communication(Presentation)	Plans/Outlines/Prototypes	Other product (rubric)
Critical Thinking	Rough Drafts	Test
Creativity	Checklists	Peer Evaluation
	Anecdotal notes	Self evaluation

Reflection Tools

Journal/Log	Class Discussion	Survey	Focus Group

Product

Culminating Product: *Does the culminating project have a group component, an individual component, or both, and how will they be assessed?*

	Description	***Assessment Tool***
Group	The class (or small group) will complete a book exploring empathy and compassion for others and present it at a reception for invited guests.	Rubric and/or checklist
Individual	Individuals will complete an illustration for the book focusing on 1 emotion and the colors used to represent that emotion. They will present their illustration at a reception for invited guests.	Rubric and/or checklist

Presentation Audience
Class
School - selected members will receive invitation to reception/presentation
Community
Experts
Web

Timeline: *List any key dates or milestones for this project.*

Session 1: Intro and Entry Event
Instruction on parts of a book, author and illustrator
Read *My Many Colored Days* and analyze illustrations
Session 2: Instruction on colors and emotions they can represent
Instruction/discussion on empathy and compassion.
Session 3: Intro culminating project - Investigate and Plan
As a group plan for book and illustrations. Brainstorm how to use the book within the school community to build empathy/compassion. Create rough draft/sketches
Session 4&5: Create & Design
Students work on individual pages of book.
Assemble book.
Session 6: Practice presentation.
Session 7: Presentation/reading of book to invited guests at reception.
Session 8: This is extra session in case more time is needed to complete the pages for book but could also be a review or evaluation session. It can also be eliminated if it is not needed.

Illustrated Page Rubric

	3	2	1	0
Relevance of Illustration	Illustration is related to the topic of the book and helps to convey a message of building empathy.	Illustration seems to be related to the topic of the book and the message of building empathy but is not obvious.	There is not much evidence that the illustration relates to the topic of the book and message of building empathy.	The illustration is totally unrelated to the topic of the book and message of building empathy or there is no illustration.
Mechanics: spelling/grammar	No grammatical, spelling or mechanical mistakes on the written part of the page.	Only 2-3 grammatical, spelling mistakes or mechanical mistakes on the written part of the page.	There are 4-6 grammatical, spelling or mechanical mistakes on the written part of the page.	There are many grammatical, spelling or mechanical mistakes on the written part of the page or the written piece is missing.
Presentation	Presentation was clear and included a description of how illustrations help to create mood, emotion, character and setting. They were able to elaborate on how they used their illustration to do this for their page in the book.	Presentation included a brief description of how illustrations help to create mood, emotion, character and setting. They described how they used their illustration to do this for their page in the book.	Presentation lacks a firm description of what illustrations help create and there is little mention of how they used their illustration to demonstrate mood on their page of the book.	They did not present anything.

Plan/defense for Building Empathy and Compassion using the Book.	A well thought out plan was presented and defended for using the book to build empathy and compassion within the school community.	A plan was presented and defended for using the book to build empathy and compassion within the school community.	An attempt at a plan was mentioned for using the book to build empathy and compassion within the school community but it was not defended.	No plan was mentioned or defended.

Math and Dance

Teacher(s) Evelyn Mariano
Unit/Lesson: Symmetry
Grade(s): 4
Duration: 4 sessions

Integration of	21st Century Skills
Math Dance	Critical Thinking Creative Thinking Communicating
Content Standards	**Art Standards**
NGMath 4.G.3 Recognize a line of symmetry for a two dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	Dance: DA:CR2.1.4b Develop a dance study that expresses and communicates a main idea. Discuss the reasons and effectiveness of the movement choices. Process: Creating, Performing Anchor Standard: Organize and develop artistic ideas and work.

Essential Questions
How can we use dance to convey the main idea of symmetry? How can we create symmetry using dance?

Key Vocabulary	Arts Concepts	Materials
Symmetry, line of symmetry	Create, Respond	Images that show symmetry in art such as Leonardo Da Vinci's *Mona Lisa* or Georgia O'Keefe's *Cow Skull - Red, White and Blue* videos of symmetry in dance such Lia Kim Choreography/Sing-Pentatonix https://www.youtube.com/watch?v=eVQKB0BgxFg or Symmetry Twins Dance Crew https://www.youtube.com/watch?v=t79p-1d--vU , lines of symmetry worksheet, pencils, blank paper

Lesson Sequence (Overview of activities, concepts, etc.)	Assessments
Students will observe and discuss symmetry in examples of fine art and the iNotice3 strategy. They will explore the definition of symmetry and what the line of symmetry is. They will look for examples of symmetry in art, math and everyday objects. Students will observe videos of symmetrical dancing and use the S-T-W strategy. They will practice symmetry by using the Mirroring Strategy. Finally, students will create their own dance in small groups to demonstrate their understanding of symmetry and line of symmetry.	• Formative: Lines of Symmetry worksheet • Summative: Rubric

Instructional Delivery (guided, collaborative, and self directed)

Student Learning Outcomes:

- Students will be able to recognize a line of symmetry.
- Students will be able to identify line-symmetric figures.
- Students will be able to draw lines of symmetry.
- Students will develop a dance phrase that expresses the main idea of symmetry.
- Students will discuss the reasons and effectiveness of the movement choices.

Pre-Engagement:

Have fine art pieces such as Leonardo Da Vinci's *Mona Lisa* and Georgia O'Keeffe's, *Cow's Skull - Red White and Blue* displayed for students to see when they walk in the room. Use the iNotice3 Strategy to get students talking about these paintings. Have them observe the paintings quietly for about 5 minutes and write down three things on a blank sheet of paper about the paintings. Next, have students take turns talking about what they notice. Compare the similarities in the two paintings and introduce the concept of symmetry.

Focal Lesson:

Part 1

- Teacher introduces and defines symmetry and line of symmetry.
- Students will look for examples symmetry in the room and in the visual art presented around the room.
- Students will take turns pointing out the line of symmetry in the various objects presented.

- Students will complete a worksheet by drawing the lines of symmetry on the shapes presented.

Part 2

- Teacher will begin by demonstrating that the human body is symmetrical. It can virtually be “folded in half” and demonstrate where the line of symmetry would be(down the center of the body) by “folding” their arms in. They will display a variety of poses and have students identify whether they are symmetrical or not.
- Students will take a turn posing in symmetrical poses. At the sound of a chime they will change their pose. Small groups can take turn posing and the other group can decide if they are symmetrical or not. If they are not symmetrical they can point out what to change in order to make the pose symmetrical.
- Students will draw their favorite pose and add the line of symmetry to the drawing.

Part 3

- Show videos of symmetrical dances. Use a S-T-W chart (see handouts) while they are watching. Discuss when finished.
- Students will use the Mirroring Strategy to practice making symmetrical movements. This will be done in pairs.They should try different moves and note what works and what doesn’t. Why do these moves work/not work?
- In small groups, students will create a sequence of dance moves that will convey the main idea of symmetry that will be performed in the next session.

Part 4

- Students will perform their dance moves for the rest of the class. Discuss the performances .

Assess and Extend

Students will present their dances to the class one group at a time. They should introduce their dance and discuss how they created symmetry in putting their dance moves together. After each dance the students observing will point out where they saw the line of symmetry and can ask any questions to the group. Provide some time for reflection.

Extension: Students could extend this by compiling all of their dance moves into one big dance. They could also explore how else they could use props in their dances to create even more symmetry. Perhaps they could even perform the dance for parts of the school community.

Differentiation

Students can be allotted extra time as needed. Students with physical or motor issues could become choreographers and direct other members of the group in the dance. Teachers and assistants can be integrated into groups to help keep students focused on task and provide a model of behavior.

For students who finish above level or finish quickly paper can be provided and students can draw a piece of their dance and draw the line of symmetry as well.

Reflection Opportunities

Student Reflections: Key questions to ask students

- What part of the lesson was challenging for you?
- What was the most interesting part of the lesson?
- Would you change anything that you did during this lesson?

Teacher Reflection: Key questions to ask yourself

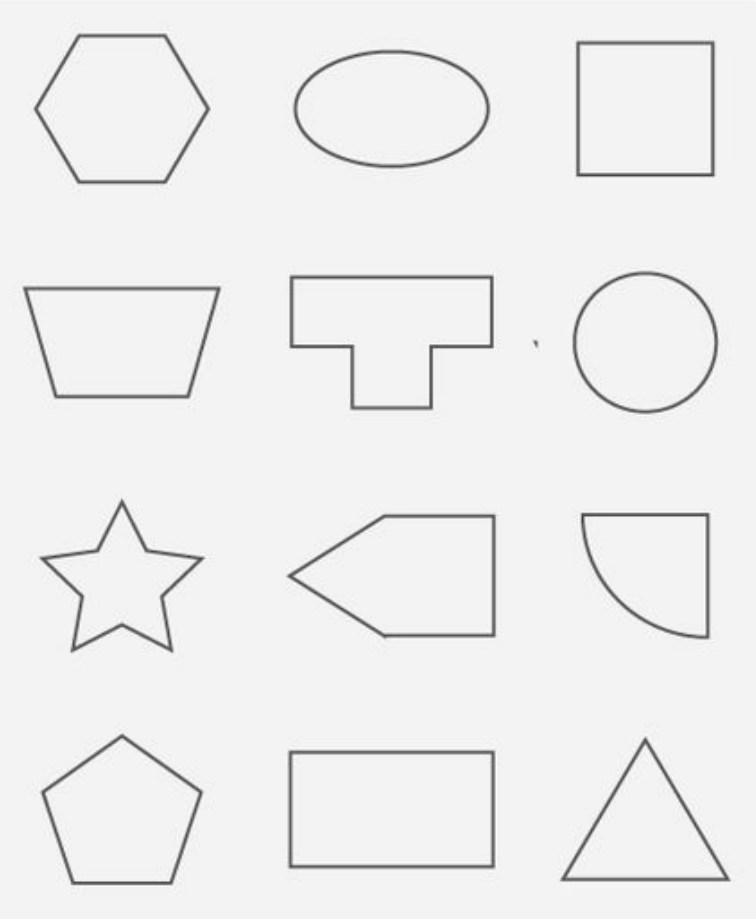
- Was there a seamless connection between the dance and the science in the lesson?
- What pieces of this lesson were a challenge?
- Which pieces were the most engaging for student/teacher?
- What would you do differently? Keep the same?

Handouts

Lines of Symmetry

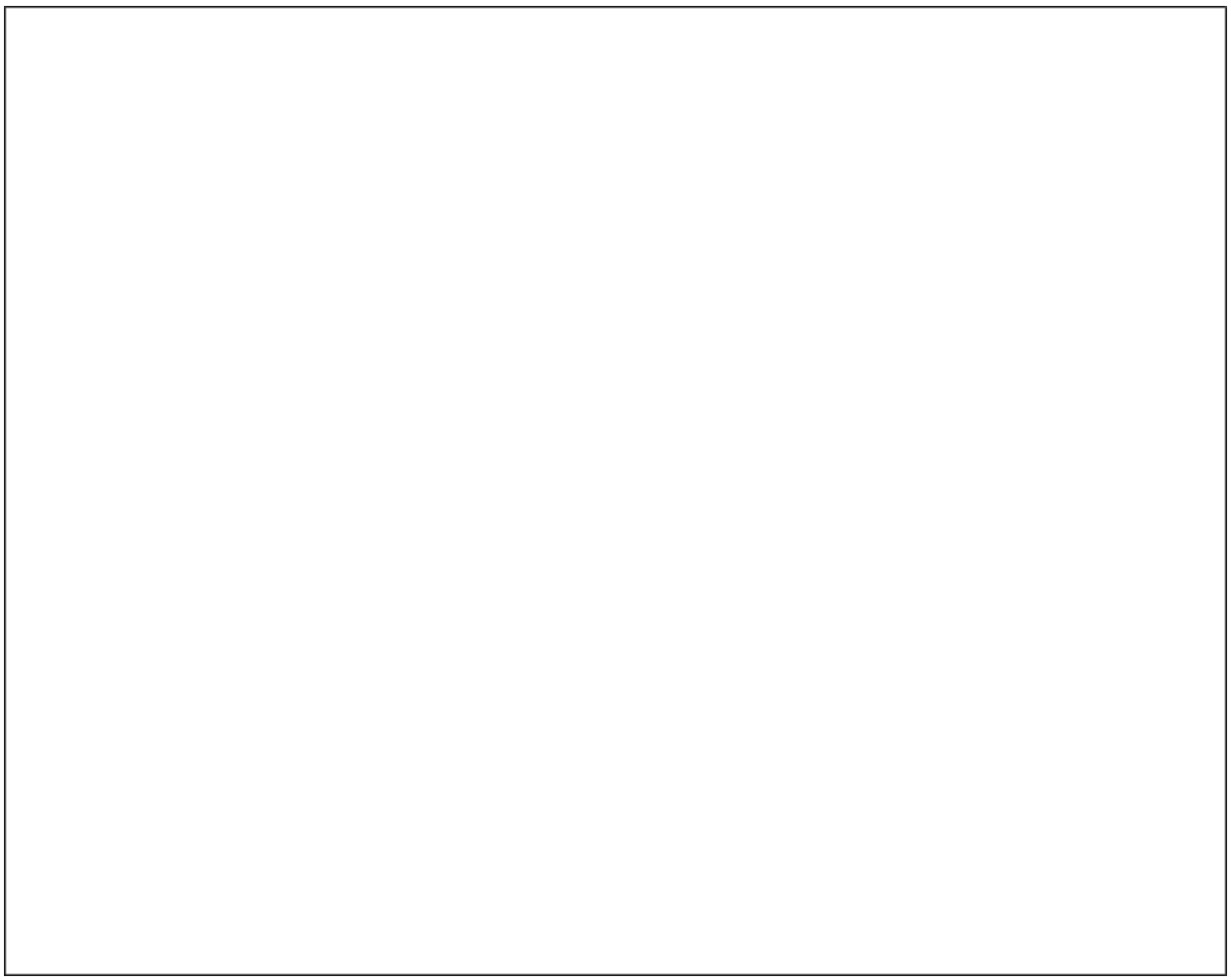
Name:_____Class_____Date_____

Draw the line of symmetry on the following shapes.



Name:_____Class_____Date_____

In the space below draw a picture of your favorite symmetrical dance pose. Don’t forget to show the line of symmetry!



Name:_____Class_____Date_____

See-Think-Wonder

See	Think	Wonder

Symmetry Dance Rubric

	3	2	1	0
Line of Symmetry Worksheet	The line of symmetry is correctly drawn for all 12 two-dimensional figures	The line of symmetry is correctly drawn for 8 to 11 of the two-dimensional figures	The line of symmetry is correctly drawn for 5 to 10 of the two-dimensional figures	The line of symmetry is drawn correctly for 0 to 4 of the two-dimensional figures
Dance Study	Dance study communicates the main idea of symmetry with clear and concise dance moves. The line of symmetry is obvious.	Dance study communicates the main idea of symmetry . A clear line of symmetry is evident.	Dance study attempts to communicate the main idea of symmetry although dance moves are not exactly the same on both sides of the line of symmetry. The line of symmetry is hard to see.	There is no attempt to communicate the main idea of symmetry and there is no line of symmetry.
Defense of movement choices	Student clearly defends the choice of movements to convey symmetry and can explain why these movements are effective.	Student defends the choice of movements and explains why they are effective to convey symmetry.	Student defends the choice of movements but can not explain why they are effective.	There is defense of movement choices and no explanation of their effectiveness.

Sample Steam Unit

Unit Lesson:
Alexander Calder
Balance and Kinetic Energy

For the Teacher

Teacher Overview

This unit is meant for the Middle School levels but can easily be adjusted for either high school or elementary levels as well. It is planned for 6, 45 minute sessions but can easily be shortened or lengthened depending on the age or population you are working with. This unit is meant for students who have some prior knowledge of the scientific principles of balance and kinetics. It is assumed that they will be able to apply this knowledge to understanding how Calder used them to create his mobiles.

This unit showcases the work of artist/engineer Alexander Calder and his kinetic sculptures as an avenue to further explore balance and kinetic energy. Alexander Calder created the first mobiles. Mobiles are balanced, kinetic sculptures that respond to environmental factors such as wind. His artworks had moving parts that were intended to be interactive. Students will investigate and explore the principles of balance and kinetics (along with any environmental factors that can affect them) in the work of Alexander Calder. Dance and technology will be used to enhance this unit of study. For a culminating project, students will create a Calder inspired Mobile (taking into consideration constraints and environmental factors) that demonstrates their understanding of balance and kinetics. Students will be using the 21st century skills of creating, critical thinking and problem solving during this unit.

CORE Standards Addressed

These are the standards that will be addressed at the end of the unit.

Science: MS-ETS-1.1 Define the criterias and constraints of a design problem with sufficient precision to ensure a successful solution taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	Visual Art: VA:Cr1.2.7 Develop criteria to guide making a work of art or design to meet an identified goal.

Additional Standards Addressed

These are standards which are used to enhance the unit, but are not the focus for assessment of skills and process.

Dance: DA:Pr5.1.7a Apply body-use strategies to accommodate physical maturational development to technical dance skills(for example, functional alignment, coordination, balance, core support, kinesthetic awareness, clarity of movement, wight shifts, flexibility /range of motion).	Technology: ISTE 4 Innovative Designer a. Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. b. Students develop, test and refine prototypes as part of a cyclical design process.

Essential Question:

How do scientific principles and environmental factors affect design?

Learning Outcomes

Students will…

- Understand and apply scientific knowledge of balance and kinetics in planning and creating a mobile.
- Develop criteria and list constraints of the design problem of creating a mobile that interacts with the environment.
- Use the list of generated criteria and constraints to guide the creation of a mobile.
- Balance objects from a balance point.
- Use the elements of art in creating a mobile (especially balance, shape, space, variety, rhythm, and emphasis)
- Use good craftsmanship to build a mobile that does not fall apart when exposed to environmental factors.

Schedule of Sessions

This schedule is based on 45 minute sessions but can be adjusted as needed.

Session 1:

- Overview of unit
- I Can statement
- Warm Up Activity - See, Think, Wonder
- Activity - Review scientific concepts of balance and kinetics. Allow students time to experiment with scales, etc.

Session 2:

- Quick review from last session
- Go through stations on Calder. 3 stations, 15 minutes at each
  Video, books/magazine articles, interactive mobile creating app

Session 3

- Review balance/kinetics using dance
- Plan/design Calder-like mobile on paper
- Produce a prototype using pipe cleaners and cardboard/foam shapes
- Make note of what works/doesn't work and adjust plans accordingly
- Revise mobile according to notes
- Plan and select materials to create final mobile. Students will be introduced to using the 3D printer in the next session but do not have to use it.

Session 4 & 5

- Introduce & demo **3D Builder** program to create forms for mobile using 3D printer
- Students who choose to will program for their shapes and print them.
- Assemble mobiles using choice of materials.

Session 6

- Present mobiles
- Evaluations/Discussions

Assessment

The formal assessment for this unit is the rubric below.

	3	2	1	0
Conceptualization	Student produced a detailed and cohesive plan including 3 or more criteria they deemed necessary to create a balanced mobile and solve the design problem and meet the goal of balancing a mobile with moving parts.	Student produced a cohesive plan that includes at least 2 criteria they deemed necessary to create a balanced mobile and solve the design problem and meet the goal of balancing a mobile with moving parts.	Student produced a plan that had fewer than 2 criteria necessary they deemed necessary to create a balanced mobile and solve the design problem and meet the goal of balancing a mobile with moving parts.	No plan was completed or produced.
Use of the Elements & Principles of Art	Student produced a very effective mobile demonstrating exceptional use and awareness of balance, shape, space, variety, rhythm, and emphasis.	Student produced an effective mobile using balance, shape, space, variety, rhythm, and emphasis.	Student produced a mobile but had limited use of balance, shape, space,variety, rhythm, or emphasis.	There is no sense that any elements or principles of art were used or no mobile was created.
Scientific Knowledge & Understanding	Students mobile demonstrated an advanced understanding of balance and kinetics, including multiple balance points and attached in a manner so that nothing falls off under any environmental influences (wind or vibration).	Student's mobile demonstrated an understanding of balance and kinetics including a balance point and attached in a manner so that nothing falls off under any environmental influences (wind or vibration).	Student's mobile demonstrated a limited amount of balance and/or kinetics and some parts detached under environmental influences (wind and vibration).	There was no demonstration of balance or kinetics, no balance point, or mobile fell apart under environmental influences or no mobile was created.
Craftsmanship	Student's work demonstrates a high level of	Students work demonstrates good	Student's mobile is lacking good craftsmanship. It	There was no care taken in the production of the

	craftsmanship and attention to detail, no major defects or kinked wire. It is meticulous.	craftsmanship and attention to detail - clean, no major defects and few minor defects and no kinked wire.	lacks attention to detail, has some defects and kinked wires.	mobile or no mobile was created.
Using criteria to meet a goal	Student was able to follow their plan and anticipate and make revisions before they were needed to meet the goal of creating their mobile.	Student was able to follow their plan and make revisions as needed to meet the goal of creating their mobile.	Student was able to partially follow their plan and had difficulty making revisions as needed to meet the goal of creating their mobile.	The student was unable to follow a plan or make revisions to meet the goal of creating their mobile or no mobile was created.

Resources

Books

Greenfeld, Harold. *The Essential Alexander Calder*

Lipman, Jean. *Calder and His Magical Mobiles*.

Stone, Tanya Lee. *Sandy's Circus*

Websites

http://www.calder.org/

http://www.christies.com/Features/Alexander-Calder-7749-1.aspx

10 Things to Know About Calder

Videos

https://www.youtube.com/watch?v=QMFICm6Yyxw

https://www.youtube.com/watch?v=DScnuGhDuOc

https://www.youtube.com/watch?v=tYQD5jiQ62g&t=1s

Apps

https://www.nga.gov/education/kids/kids-mobile.html

Computer Program

3D Builder

Student's Begin Here - I Can

Session 1

Essential Question:

How do scientific principles and environmental factors affect design?

Session 1 - Let's Warm Up!

Look at Rouge Triomphant(Triumphant Red) by Alexander Calder.

Rouge Triomphant (Triumphant Red) (1959-1963) by Alexander Calder, via Gagosian Gallery

Questions

What do you see? What do you think? What do you wonder?

I see...

I think ...

I wonder ...

After sharing what they see, think, and wonder students will break into pairs and experiment with balance scales. Various items should be available for use. They can include but are not limited to coins, blocks, feathers, foam shapes, etc. They should explore the following ideas.

How do you get things to balance?
Do they need to be identical on both sides in order to balance?
Discuss symmetrical and asymmetrical balance.
What environmental factors could change how things balance?
Does motion come into play at all?

Session 2
Calder Stations

During this session, students will rotate through a minimum 3 stations in small groups or pairs. Each station will represent a different method for exploring information on Alexander Calder and his kinetic mobiles. There is a video station, book station, and an interactive, online link (https://www.nga.gov/education/kids/kids-mobile.html). Please see the Resource section for a list of videos and books. At the end of the rotations students will answer questions on the handouts and draw a sketch of the mobile they created using the interactive site
https://www.nga.gov/education/kids/kids-mobile.html

Name:_____ Date:_____
Class: _____

Alexander Calder

List 3 things you learned from the video or books about the Artist Alexander Calder.

1.

2.

3.

What is 1 question you would lke to ask Alexander Calder if you could?

Name: _____ Date:_____
Class:_____

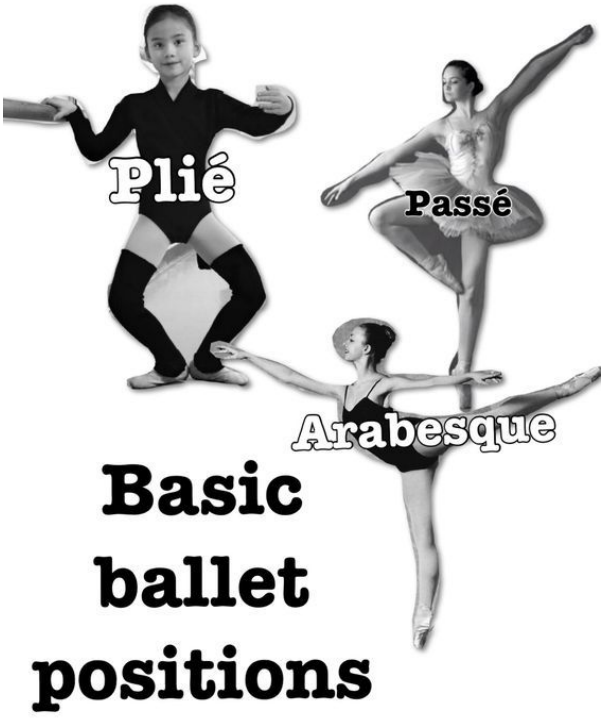
Draw a sketch of a 5 piece mobile you were able to blance using the Mobile Maker program.

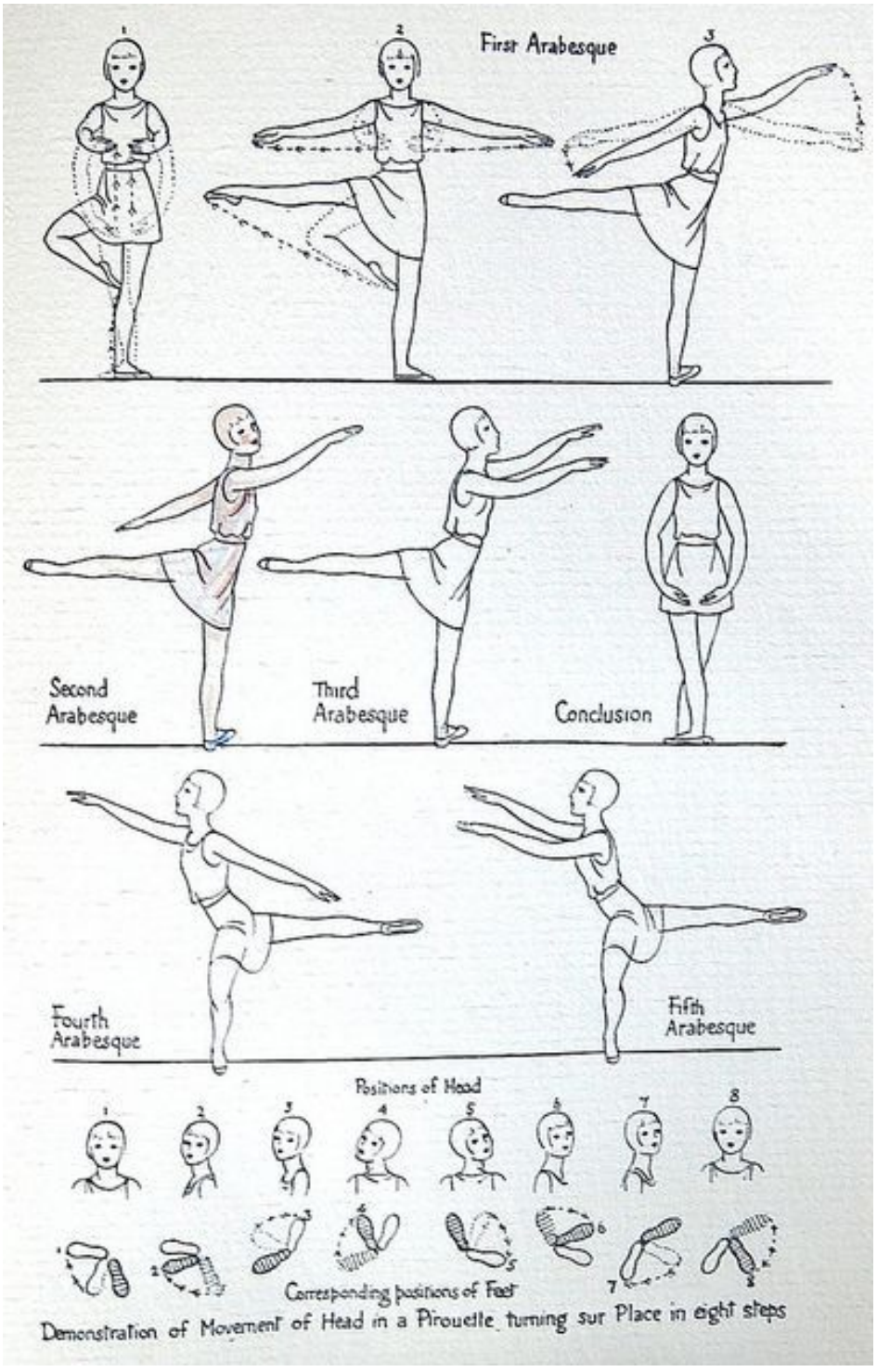
Session 3

Balance and Kinetics - Dance

Students can watch a video of some basic ballet moves. As they watch they should discuss how balance is achieved and how kinetic energy impacts the moves of the dancer. Students will then break into small groups with the handouts of some ballet poses. They should try the poses and compare/contrast them to the pieces in Calder's mobiles. How do the pieces in the mobiles dance? How is the use of balance and kinetics similar?

https://www.youtube.com/watch?v=j1DlCLj8Au8




First Arabesque
Second Arabesque
Third Arabesque
Conclusion
Fourth Arabesque
Fifth Arabesque
Positions of Head
Corresponding positions of Feet
Demonstration of Movement of Head in a Pirouette turning sur Place in eight steps

Mobile Challenge

You are now ready for the “Mobile Challenge.” Create a mobile like Alexander Calder. What criteria will you use to ensure that you create a mobile that will have moving parts? What constraints will you need to consider for your design problem? Use these criteria and constraints to develop a plan to meet the goal of creating a mobile. When you are done planning, create a prototype using pipe cleaners and foam shapes. Revise your mobiles. Will you use the **3D Builder** program in the next session? What materials will you use to create your mobile?

Name:_____ Date:_____
Class: _____

Alexander Calder - Mobile Design
Exit Ticket

Write an explanation for how your pipe cleaner and foam shape mobile is balanced.

Sessions 4 & 5

Now the students are ready to use the **3D Builder** program to print their shapes using the 3D printer. After a demonstration of how to use the program students can use the chromebooks if they chose to do so and will then take turns printing their pieces. If this takes more time than the session allows, students should print 1 piece and then the others can be printed and ready for the next session. As pieces are ready students should begin to assemble their mobiles. Additional supplies needed will be wire and pliers to shape and attach pieces. For students who have chosen other materials to create their mobiles they will create their parts and assemble them.

Session 6

This last session will be spent presenting mobiles to the class. At this point students can reflect on the processes they used as well as the success and/or difficulties they encountered along the way and any improvements or changes they could have made.

Sample Assessments

Formative Assessment

Review Sheet

Standards Addressed

CCSS.ELA-Literacy R1.8.2 Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.	Visual Art: VA:Re9.1.8a Create a convincing and logical argument to support an evaluation of art.

In this lesson, students read the article ”Painting an Icon” in *Scholastic Art Magazine*(September 2017) about Iconic Paintings. Important terms and ideas are discussed as well as three iconic paintings, Leonardo da Vinci’s *Mona Lisa*, Vincent Van Gogh’s *Starry Night*, and Jackson Pollock’s *Number 34, 1949*. When the reading and discussion is complete students fill out this Review Sheet to check on their understanding. The teacher will mark a check for a correct response and circle responses that need work.

Review Sheet - Iconic Paintings
(adapted from materials from Scholastic Art Magazine, September 2017)

What is the theme or central idea of the text?

_____
_____
_____

Define Iconic.

_____
_____
_____

List 3 ways a work of art could become an iconic work of art.

- _____
- _____
- _____

What characteristic makes the *Mona Lisa* an iconic artwork?

_____
_____
_____

Van Gogh's *Starry Night* touches viewers on an _____ level.

Jackson Pollock's work was considered revolutionary. Why?

_____
_____
_____

Leonardo Da Vinci's Mona Lisa and Jackson Pollock's *Number 34, 1949* are both considered to be iconic paintings. Write a paragraph evaluating these two iconic paintings. Be sure to include details to support your evaluation.

Diagnostic Assessment

Teacher Observation - Checklist

During the next stage in the Catapult Painting lesson, the teacher will assess students while observing how they are assembling, refining and revising their catapults through trials and peer collaboration. This includes providing each other with constructive criticism. The teacher will check off criteria as they are attained. If there is no check mark the student did not complete the task.

Standards addressed:

NGSS MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	Visual Art: VA:Cr1.1.6a Combine concepts collaboratively to generate innovative ideas for creating art. Visual Art: VA:Cr1.1.7a Apply methods to overcome creative blocks.

Catapult Painting Teacher Checklist

Criteria	Check?
The student examined the supplies and defined a set of criteria for building a catapult that would work to apply paint to a canvas.	
Student worked collaboratively with peers offering valuable insights and suggestions for improvements to the catapult in order to generate an innovative idea for creating art.	
Student received constructive criticism from peers as well as their own insights and effectively refined and revised their work to be more successful.	
Student used their knowledge of forces in designing a catapult.	
During trials, student took into account how they might impact the surrounding environment and took precautions to protect that environment.	
Student was able to overcome any problems met in completing the task even when they encountered a creative block.	

Summative Assessment

Rubric

This rubric will be used at the completion of the Paper Airplane project. After the initial test runs students will have discussions with each other to identify what needs to be changed or improved on their prototype. based on these discussions students will use this information to refine their work. The planes need to be visually pleasing as well as to function. They will have a final test flight when all work is completed.

Standards Addressed:

Science: 3-5-ETSI-2 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Visual Art: VA:Cr2.2.4 Utilize and care for materials, tools, and equipment in a safe manner. Visual Art: VA:Cr3.1.4 Refine artwork in progress on the basis of insights gained through peer discussion.

Rubric - Paper Airplanes

	Mastered	Proficient	Needing Improvement	Not at all or missing
Performing fair tests with controlled variables.	Student was able to design and perform tests with a controlled variable to determine what worked as well as what improvements to make to the airplane.	Student was able to design and perform a test with a controlled variable to determine what improvements to make to the airplane.	Student attempted to design and perform a test to determine what improvements to make to the airplane but there was no controlled variable.	There was no attempt design and perform a test.
Care and Safety of materials, tools and equipment.	The student demonstrates good and careful use of materials and tools. Student is always using tools in a safe manner.	The student mostly demonstrates a careful use of materials and tools but was unsafe or misused a tool 1 time.	The student was safe with tools and materials at times but had to be reminded often to use them carefully or safely.	The student was very unsafe with tools and materials and was unable to complete the project.
Peer Discussions	Student actively participated in peer discussions offering valuable insights for potential improvements.	Student participated in peer discussions and was able to offer insights as to potential improvements.	Student tried to participate in peer discussions but was unable to offer any insights that were appropriate.	Student did not participate in discussions nor offered any insights for improvements.
Refining and Revising	Student was able to take the	Student was able to take the	Student attempted to	The work shows no

	insights gained from test flights and peer discussions to refine their work and have a more visually pleasing plane and a more successful final flight.	insights gained from test flights and peer discussions to refine their work and have a visually pleasing plane and a slightly more successful final flight.	use insights gained from test flights and peer discussions but had difficulty refining and revising their work. The final flight was not more successful than the fair tests.	attempt at revision or is missing.