Designing Art Lessons that Integrate with Core Curriculum

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If your elementary school is like many in the nation, art lessons come in the form of an occasional, isolated extra-curricular activity. But even if your school is fortunate to have a dedicated art teacher, the lessons may not be integrated with core subjects.

Recognizing this gap, the non-profit Art in Action recently developed a curriculum unit with art at its center but designed with hardcore STEM learning objectives. We documented the development process since its focus on cross-discipline collaboration, using both internal and external stakeholders, proved to be both highly effective and easily reproduced. We hope you consider creating your own STEAM curriculum using our example of Spirals in Nature as a springboard.

STEAM Curriculum Development: 6 Easy Steps

1. Collaborate

Developing an integrated, cohesive lesson works best when there is collaboration and a shared sense of purpose among teachers, program leaders and parent experts. To help us develop the Spirals in Nature curriculum and create a fully-integrated lesson plan, we worked with an elementary school that had experience utilizing Art in Action curricula through a parent docent program and an established school gardening program called BUGS (Better Understanding of Gardening Science).
In this case, collaboration needed to start early since the core concept of learning about the Fibonacci sequence needed a visual example growing in the BUGS program...so romanesco broccoli was planted. Therefore, preparation for the math and art portions of the lesson actually started months earlier.

2. Create a Timeline

It is critical to create a detailed timeline of lesson development when designing collaboratively. Because of the range of components and core subjects involved in *Spirals in Nature*, our timeline needed to take into consideration gardening and growing requirements, grade-level testing of the lesson, time of year ideal for introducing the math and science components and backup plans in case of unexpected challenges.

For example, romanesco broccoli takes 85 to 100 days to grow. We planned to teach the lesson in January, so students planted the vegetables in October. During the fall the students tended the garden and watched the plants grow. Upon return from the winter break, however, the students discovered that wild animals got into the garden and enjoyed a broccoli feast. Our takeaway? Add a trip to the grocery store as part of the backup plan.

3. Design the lesson

We began by focusing on reviewing education standards for grade levels to determine the optimal age-appropriateness. After taking a look at the National Core Arts Standards, the Next Generation Science Standards and the Common Core Standards for Language Arts and Math, we felt we could best design a lesson with our desired concepts...
for the second grade. For example, second graders are expected to be able to answer questions about how the land changes and what makes plants grow. In second grade math, students learn measurement and number sequencing. For the art component we focused on growth narratives to align with second grade Language Arts standards.

Spirals in Nature followed Art in Action’s standard structure for student engagement:

- Observe: look at artworks that relate to the theme.
- Interact: discuss with the students what they are seeing.
- Learn: introduce vocabulary and history through art. Do: create an artwork that reflects the new knowledge gained.

4. Develop the Art Project

For the art project, we wanted to ensure that basic materials would be on hand at the school. Materials:

- Colored pencils or watercolor pencils
- Brushes and water (if using watercolor pencils)
- For each student:
  - 9 x 12 - 1/2 inch graph paper, cut in half to be 6 x 9
  - Black construction paper 1-12 x 18 inch
  - White construction paper cut in: 2-1x1 inch squares, 1-2x2 inch square, 1-3x3 inch square, 1- 5x5 inch square, 1-8x8 inch square

The Spirals in Nature art lesson began by using the Fibonacci sequence to create The Golden Spiral. The students were given graph paper with a pre-drawn 1 x 1 square. They then graphed the Golden Ratio by continuing to add squares based on the Fibonacci sequence.

To create the spiral, they drew an arc from corner to corner in the first square, continued into the second square, then completed the arcs in each square to reveal the spiral.
For the final project, students were given white pre-cut squares and were told to draw an arc from corner to corner on each square. They created their spirals by connecting the arcs, starting with the largest and spiraling down to the smallest and glued them onto black construction paper. To finish, they were given choices to visually express themselves:

- Tell a story of “growth” - i.e. seed to flower/tree
- Tell a story about the progression of a day in their life
- Turn the spiral into something they see in nature, such as an elephant trunk, a hurricane, or a snail’s shell.
- Create an abstract design using the spiral.

5. Test the lesson

Select a classroom instructor. In our case, this could either be a teacher, a program coordinator or parent volunteer. Allowing someone else to teach the lesson will help you know if your instructions are clear and give you the chance to observe the children’s reactions and behaviors more closely. Take photographs or video to compare and evaluate each test lesson so that improvements can be made. Insights pertaining to grade level and age will be revealed when you test in different grade levels. For example we learned that motor skill development can make some parts of our lesson a challenge when trying to skew to younger grades.

6. Evaluate the lesson

It was important to us to track feedback from both teachers and students. We created a teacher survey and a simple pictorial-based immediate feedback form for the students. You may need to assure parent volunteers that critical feedback is critical to ensure that the lesson is successful.

1.) How did art class make you feel today (circle) ?

2.) If you could tell a friend about art class today, what would you tell them?

3.) What did you like about art class today?

4.) What did you not like about art class today?

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The feedback we received from teachers and parent volunteers indicated that the lesson was a success. The students enjoyed the project and began to grasp the connection among science, math and art, heightening their curiosity and a healthy sense of wonder about other ways the STEAM are connected.

We give special thanks to BUGS Coordinator Kate Pfaff who co-authored the original lesson plan. Have fun collaborating!

Kelly Bravo provides program support and maintains the quality of the Art in Action program in schools by working closely with Art in Action’s school coordinators and docents. Art in Action currently reaches more than 50,000 students in nearly 2,000 classrooms nationwide. Founded in 1982, Art in Action, a nonprofit 501(c)(3) organization, transforms school communities and their students through an engaging, hands-on curriculum that teaches 21st century learning skills through art history, appreciation and practice. Find Art in Action on Facebook and Twitter and at artinaction.org.

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