Art in the Age of STEAM

How to Add Science and Math to Your Lessons without Breaking the Budget, Boring the Students, or Losing Your Mind!
The STEAM Model

Science
Technology
Engineering
Mathematics
“...a da Vinci stage has to be reached. The greatest scientists of all time were artists.”
Neri Oxman
Neri Oxman’s Work

The Beast

Gemini
STEAM Influences
SLOs, EEPs, PPGs, PDPs, UFOs, ... and now STEAM?
(Why You Shouldn’t Give Up and Get a Job Washing Kittens at the ASPCA)

- Self Preservation in the Face of Public Policies
- Support Core Curriculum Teachers
- Better Art through Understanding of Materials and Processes
- Preparation for Integration of Art and Tech in the Future
What is the most important thing you will learn today?

You already know this stuff - you beautiful, smart art educator!

Yes, you!
STEAM in Art History
STEAM in Art Materials and Lessons
Intrinsic or Extrapolated
Example: Copper Jewelry Project

Intrinsic

Extrapolated
How to Start - Collaborate

- Coordinate Curriculum
- Identify Key Vocabulary
- Share Resources
How I Feel When a Kid Can’t Properly Use a Ruler
Math

Vocabulary

- Origin=center point
- Line of symmetry, translations, slides, etc.
- Oblique=diagonal
- Horizon line = X-axis
- Vertical line = Y-axis
- similar shapes, congruence
- relative size/proportion/ratio/scale

Concepts

- Measurement
- Fractals
  - Koch Snowflake
  - Mandelbrot
- Chaos
- Fibonacci Sequence
- Tessellations
Examples of Math Applications
Math – Fibonacci Sequence

Doodling in Math: Spirals, Fibonacci, and Being a Plant [1 of 3]

Vi Hart
Mathematics - Fractals
Mathematics - Tesselations
Mathematics - Origami
Technology – Photoshop, Animation, 3D Printing, etc.
The Physical Properties of Clay
A Love Story

Plasticity – What is it?

- Clay’s most important quality is that, basically, it loves itself. That means that clay particles are attracted to each other. Like this -

![Image of clay particles with love hearts and emotions]
Science and Technology - Ocarina

\[ f = \frac{v}{2\pi} \sqrt{\frac{A}{V}} \]

- Larger opening gives higher frequency since air can rush in and out faster.
- Larger volume gives lower frequency since more air must move out to relieve a given pressure increase.
- Larger neck gives lower frequency since there is more resistance to air moving in and out.
- ~ Length of cavity
- ~ Volume
- ~ Opening port

Create a sound wave using the parameters and test it out on a real ocarina.

Make it a piece of art, add colorful glazes or paints on the ocarina.

Science and Technology - Ocarina
Science and Technology - Fused Glass
Fused Glass
Science and Technology - Printmaking
Printmaking with Conductive Paint
Science and Technology - Robots
Robots
Robotic Artworks
These are only a few lesson ideas – everything you currently teach has STEM components!

Remember this – The world is interdisciplinary and if you view it with wonder and curiosity, your students will too.
Any Questions?