



STEM TO STEAM:

Science, Math & Art Integration



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Why add ART to STEM?



Art Materials Provide Inquiry Opportunities.



Art offers children the ability to think critically and solve problems in a systematic and organized way.

Master Educators tell us:

Creativity is considered a key component of 21st century teaching and learning

Arts infusion is a creative pedagogy that uses the 21st century skill of creativity to inspire and motivate children and engage them in the learning process. (NAEYC)



**Neuroscientists tell us:
Children learn best
when their five senses
are actively and
physically engaged.**

Best Practice Example - Art Infused Science & Literacy Activity

Rainforest Book

3 year old class / Pressman Academy, LA



Smart Art Lesson Plan: Paper Bag Book

Let's Look at Paint & Polymers



Through sensory play
with material objects
they can manipulate
and change...

children learn
complex thinking skills
and learn to respond,
adapt and discover new ways
to operate.



Sensory Art & Collage Materials or “loose objects” Encourage Us to Think Like a Scientist



**Kids & scientists
have something in common:
They both WONDER WHY!**

more best practice examples



Which one captures your attention? Why?

more examples from Pinterest



Which one captures your attention? Why?

Kids & Scientists both try to figure things out



SCIENTIFIC INQUIRY:
Observe & Investigate

Effective Science Centers are simple and inviting

CA PreK

Learning Foundations

SCIENCE STRANDS

1. Scientific Inquiry

- A. Observe
- B. Investigate
- C. Communicate
- D. Document

2. Physical Science

3. Life Science

4. Earth Science



They captivate
the senses

And often
involve **LIGHT**





Observing Living and Non Living Materials



1. SCIENTIFIC INQUIRY –
Observe Investigate

2. PHYSICAL SCIENCE
Properties Characteristics





1. SCIENTIFIC INQUIRY
2. PHYSICAL SCIENCE
3. EARTH SCIENCE



Re-Cap: Why add ART to STEM?



Art materials provide exciting physical contacts that activate our senses and connect our mind to our body. With ART ENGAGEMENT, the brain's neural networks are fully activated. As we experiment, we build new neural pathways that literally "grow" our brains.



Art materials inspire new ways to solve problems



This is your brain on art!



Art materials inspire HANDS ON discovery,
building new neurological pathways
and increasing the brain's capacity to learn.

- Questions?
- Comments?



Hands-On Discovery is the foundation of "Scientific Method"



Scientific Inquiry / Observation & Investigation

Scientific Inquiry:

1) Observe

2) Investigate

3) Communicate

4) Document



Science for young children involves everyday materials



Like Coloring Salt
With Liquid Watercolor



Or making Worm Gardens in Plastic Tubs

Or experimenting with salt on wet paint



Salted Watercolor Paintings

Salt & Watercolor on Coffee Filters



Or paper towels



What do **YOU** think?

How do the ATTRIBUTES of paper affect a painting?

1) Coffee Filter 2) Paper Towel 3) White Construction Paper 4) Watercolor paper



3 year olds

X-Ray Handprints

Life Science



5 year olds



PART 2: STEAM IN ACTION

Best Practice Examples



Creative Care For Children, Santa Barbara, CA
Danielle Monroy, MA / Owner - Director





Dinosaur Unit
Fossil Making with
Air Dry Putty
Liquid Watercolor



Books & Fossil Samples in Science Station



More Sensory Art Tie In's Dinosaur Stamping & Metallic Paints



Fossil Station

1. We used plaster to extend the dinosaur theme.
2. We used the sand in the sensory table and the children made a smooth mound, then pressed their hand into it.
3. We then poured the plaster mix directly into the impression, let dry 30 minutes, and remove to dry on a tray.
4. Then, a day later, the children had a "fossil station" for being Paleontologists and brushing the sand off the molds.





PLAY DOUGH ART with Master Educator: Danielle Monroy, MA

Using Air Dry Putty

Danielle on Set Up

“I think how you set up an activity is about 50 % of it's success. The rest is the quality of the materials and the creativity allowed.

Setup allows for smooth transition and ease of use

It reduces the teacher direction and interference.”



the importance of
prioritizing SET UP

Play Dough Art with Air Dry Putty





MATH: Pattern Cards
with Animal Counters
(buttons, rocks, any
manipulative)

We Painted our Own Pattern Cards



This is an activity that attracts artists who avoid math activities to come to the math activity! And visa versa - Children like the 4 year old boy here, who LOVES math and manipulatives, come to the art area and explore stretching their activity with some paint and paper!

Parent Display

This picture is of the parent display. It shows how the children learn from the materials and activities we do! Running a successful business also means teaching the parent community the importance of Early Childhood Learning, and the ways in which their activities are building blocks towards future success.



My Garden Wall



Art offers children the ability to think critically and solve problems in a systematic and organized way.



- Beads & Pipe Cleaners**
1. Wooden beads
 2. Pipe Cleaners
 3. Art Trays
 - 4. Abacus**





Twisty Ties & Air Dry Putty



In Conclusion: Why Teach STEM with ART?



Through sensory play with material objects they can manipulate and change... children learn complex thinking skills and learn to respond, adapt and discover new ways to operate.

“We used to think that schools built brains. Now we know that is play that builds brains that schools can use.”

Dr. Gordon Neufeld





Thank you for Playing!

For Handouts & Videos log onto
www.CreativePlayLA.com



Creativity gives value and meaning to learning and develops a motivational mindset that is empowering.