

# Science Is the Art of Invention

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In both science and art the “good stuff” is not necessarily the end product but the learning and fun of the journey. When we provide children with a diverse collection of materials to explore **in their own** way, we invite them to be creative and flexible thinkers as they use materials in a variety of new approaches. The purpose of science/art inventions is not to just create a picture or a sculpture. Instead, it is to encourage children to use their natural curiosity of the world around them to create experiments with basic science concepts and materials - which often do end up looking like works of art! Science becomes art and art becomes science.

**Children are born scientists.** Their play with diverse materials often turns into an experiment as they innately apply the steps of the scientific method: **observation, prediction, experimentation** and **evaluation**. In the process children are using and applying the higher order skills of creative and critical thinking and problem solving. What happens when a child wants to attach one piece of cardboard to another? Through experimentation with different methods the child not only puts together a work of art but also experiences the science concepts of balance, adherence, and structure. When children encounter a new art material or combination of materials they:

- **observe** it's appearance, composition and texture
- **predict** what they could do with it and which materials they will need to use
- **experiment** with techniques of manipulation and construction
- **evaluate** their experience, creation and the fun of making it!

## Setting Stage for a Science/Art Discovery Center:

- provide ample space for experimentation (this could get messy!)
- supply a diverse collection of art material
- furnish science materials for exploration
- invite children to use the art and science materials in many different ways. Ask questions.
- give children ample time for experimentation, even encouraging them to return to the center over a period of days or weeks to their “works in progress”

## Ask Open-Ended Questions:

*What can you do with a piece of paper?*

*How many different ways can you use this material ?*

*What would happen if these materials were wet? Will some float or sink?*

*How many different materials can you use to create change?*

*What materials will blow away?*

## Changing the Variable - a Scientific Approach to Art and Easel Painting:

In any experiment the way to get different results is to change the variable. When you add or change one thing to an experiment/project you create a whole new experience and gain greater understanding. Imagine... if children are working with exploring newspapers, you can add rubber bands. What can you do with newspapers AND rubber bands? The experience grows and changes in an instant and new possibilities for science and art exploration occur.

The process of "changing the variable" can be applied to all art and science experiences but it especially easy to do at your easel. Your easel can become an instant and ongoing science/art laboratory!

In easel painting there are three variables:

- \* **the surface to paint on:** unusual papers, different shapes and textures, three dimensional objects, newspaper, wallpaper, foil, freezer paper, tissue, even boxes!
- \* **the tool to paint with:** rollers, brushes, stamp, sponges, even a feather duster!

- \* **the paint:** colors, shades, monochromatic, water colors, thickened paint with liquid detergent or glue, paint with added surprises such as sawdust, soap flakes, sand ... invite children to paint with just plain water!

### Science-Art Themes:

- |                                |                                 |
|--------------------------------|---------------------------------|
| * Water                        | * Sound and Waves               |
| * Earth/clay/sand              | * Bubbles                       |
| * Color                        | * Light/Shadow. Sun             |
| * Shape/form/structure         | * Motion                        |
| * Rainbows                     | * Balance and Pendulums         |
| * Paper                        | * Wind/Air                      |
| * Boxes/Recycling              | * Leaves, feathers, seeds, etc. |
| * Constructing and Engineering |                                 |

Perhaps the overarching theme for Art-Science Explorations is CHANGE. It is the process that children use to interact with materials and concepts in their world. When exploring any of the themes be sure to provide plenty of opportunities for children to experiment with changing the elements in a variety of ways!

### Collections are both Art and a Science

Children are natural collectors. Just check their pockets and backpacks to see! They are fascinated with objects. Often small things such as rocks, shells, leaves, fabric scraps, beads, everything and anything.

Children's collections lead to art and science activities. Through explorations with collections of recycled materials, nature materials children see the similarities and differences in the materials and how they can be used. Use children's innate curiosity with collections of things to create art/science activities. You might ask:

- \* What do we know about the objects in our collection?
- \* What can we learn from collections? What do we want to find out?
- \* What can you do with the collection?
- \* How many ways can you use?

What **Art** techniques use collections? Collage, assemblage, sculpture, printing, shadow boxes, murals, and dioramas. And don't forget to "**change the variable**". Add water, a box, a mirror, or a flashlight and see where the art and science experiences expand and intersect!

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Questions? Write to me: [ellen@ellenboothchurch.com](mailto:ellen@ellenboothchurch.com)

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