

# Color Mixing: Science and ART

Art at the Center  
Early Childhood  
Art Focus Group  
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Josef Albers studied color for 27 years - beginning his series, "Homage to the Square" at age 61 - his quote above seems very fitting.

He recorded the colors used on the back of each of his paintings in an almost scientific process although he said, "Science aims at solving the problems of life, whereas art depends on unfolded problems. Each painting an experiment - always room for more variations."

Quotes from "An Eye for Color: the Story of Josef Albers" (GREAT children's book by Natasha Wing)

# Josef Albers

“Practical work teaches us that insight and skill depend on observation as well as on thought. And through manual work, as through art, we realize that there is, besides thinking in logical conclusions, “thinking in situations,” which is just as necessary as thinking in numbers or figures or verbal terms.”



Quote source:  
[www.albersfoundation.org](http://www.albersfoundation.org)

# John Tarnoff - Head of Show Development -DreamWorks Animation

- Dreamworks iterative process focuses on collaboration, shared responsibility, peer review
- Looking for artists who mixed colors for real



“Arts, Creativity and Other Outrageous Ideas” presentation at American Visionary Art Museum, Baltimore 2009

John Tarnoff spoke at AVAM last year and when asked what he looks for in new artists, he said people who have mixed colors with paint! Even though his is a highly digital process - he said that hands-on experience with color is very important.



# Betty Edwards

- Author of Drawing on the Right Side of the Brain - learning to draw from observation involves switching from our verbal Left brain mode to a visual Right brain mode - exercises to do this: line, spaces and shapes, perspective, value, color
- Color has Hue, Value and Intensity
- College students take series: drawing, color theory, beginning painting
- Need to MIX COLORS! to learn color theory



Betty Edwards is the author of the classic drawing text, "Drawing on the Right Side of the Brain." She uses the vase face illusion (above and being created in the drawing) to illustrate the shift from left to right brain. Drawing the first face profile, it helps to think a bit in the L mode, verbally naming the features as you move down the face. Switching to making the mirror image profile, the trick is to see the image as "just a line" and to focus on the visual details of that line in an R mode, forgetting that it is a face.

Edwards has a newer book on color in which she describes her experiences teaching color theory in college. She initially taught color theory using cut paper and collage but found that her students were unable to really apply what they learned when they went on to beginning painting, they really struggled to understand color. She made a change and began teaching color theory with mixing paint and found that her students were much better able to learn about and apply color knowledge - based on her observations and student self reports on moving on to painting class.

# Color Vocabulary

- Hue - the name of the color



- Value - how light or dark a color is - tints and shades



- Intensity - the brightness or dullness - this is changed by mixing with white, black and gray - the pure hue is intense while mixtures are less intense



## Basic Color Vocabulary

Intensity is the hardest to understand because it has to do with how "watered down" a color is - the four circles on the bottom are warm and cool of the same intensity - all four are the same intensity but different values. The orange and blue show the pure hue intensity used to mix this group.

# Color Vocabulary (cont)



- Warm colors and cool colors
- What happens when they mix?
- Strong colors and weak colors (and pigments)
- Strategies for mixing: strong color into the weak color



The idea of warm and cool colors is something even young kids seem to intuitively understand. We often begin mixing with red and yellow and talk about warm colors. The next week we switch to blue and yellow and talk about what happens when warm and cool mix. (Since blue is stronger it makes cool greens but can you also have a warm green? What would that look like? Moving on to mixing blue and red, the conversation can continue with differentiating warm and cool purples. Color strength is also a good conversation to have - teach children to mix the stronger (darker) color into the weaker (lighter color) Black is strongest and white is weakest.

# Developmental Stages of Color Mixing and Painting

- Exploration
- Energy
- Line and Shape
- Design
- Representation - Intention in Mixing



These are the same stages we have been discussing - in the next few slides I will show a version of each stage for mixing and for painting.



## Exploration - sensory experience mixing leads to hands in paint

Exploration mixing is all about the delight of paint - often on the hands, exploring the tools, the ice cube tray palette, mixing and painting are pretty much one and the same as artists are quickly ready to put paint on paper.



## Exploration - tools and mark making

Exploration stage of painting focuses on learning about paint and different painting tools. Some explorers are timid, watching and making gentle beginning marks while others jump right in, exploring with all senses.



## Energy - Delight in moving, flowing paint

The energy stage of paint mixing is really all about delight in the dripping, flowing, paint. Students like to spoon colors and will often do this in almost a trance-like state, watching the drips and designs. Some also get excited about energetic mixing with sticks. Mixing continues as part of the painting experience too.



## Energy - covering ground

Energy stage painters love to paint and often choose the biggest brushes - or the largest collection of different brushes. I often describe them as "covering ground" - enjoying a large surface and working diligently to cover it with color. At this stage kids will often gravitate to a favorite color but they are mainly concerned with getting the paint on the paper so colors are whatever is close at hand or the mix they get as they layer and swirl.



## Shape Stage - noticing and announcing color discoveries

Moving to the shape stage with mixing, young artists begin to notice the colors they make and excitedly announce these colors to their peers. Most mixtures are the result of "happy accidents" or "what happens if..." Sometimes kids can tell you what they put in to make their favorite new color. Discoveries, curiosity, and sharing are the markers of shape stage mixing. Kids get excited by the idea of naming colors but at this stage the names are sort of word play (purpley purple) or homage to friends (one child named all 3 colors she mixed "Diane" after her best friend).



## Noticing movement; lines begin to create shapes

Shape stage painters begin to notice the the results of their movement on the page. Arm motions create lines which begin to close to create shapes. There is more thought put in to color selection and although colors still often mix with the brush on the page - the process is a bit slower and more deliberate than in the energy stage. A child completing several paintings in one sitting with often move from the shape stage paintings back to energy - it seems the shape painting takes a lot of concentration and they enjoy relaxing a bit after with the sensory experience of energy painting.



## Shape stage painting with colors in distinct areas

Another version of shape stage painting has to do with beginning to place colors in distinct areas of the page as above. Here the artist is moving acrosss the page, using colors she mixed in a way that is very deliberate.



## Design Stage - focused mixing - naming colors

Moving to the design stage, color mixing becomes more focused and deliberate - there is a plan and young artists start to be able to remember what colors make up the recipe of a favorite color. Color naming is popular and starts to have to do with associations to the color.



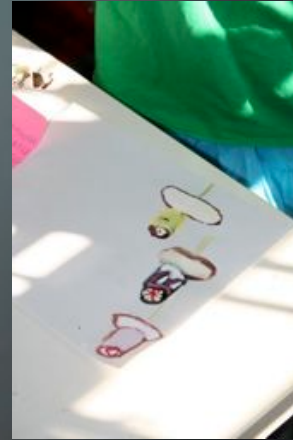
## Design Stage - design with shapes

The design stage painter begins to have more control of shapes and uses them to build designs and pictures. This young artist is actually beginning a painting of a face - there is a strong sense of design in this large circle nicely centered on the page. Design stage paintings can be representational or arrangements of line and color - both share a sense of creating visual order on the page.



## Design Stage Paintings

More design stage paintings, circles, symmetry, divisions, connections. One on upper left is very complex but only picture is side view.



## Representation - mixing to achieve target color

Working toward representational painting, the color mixing starts to be directly linked to the planned subject of the painting. Painters also begin to move fluidly between color mixing and painting, back and forth between the more scientific left brained process of mixing to the more expressive, visual process of painting. Here the artist is happy to mix just the right shade of brown for her chocolate cake.

Browns are interesting - it seems that when we don't want brown, everyone is making it but when someone does want brown no one is quite sure how to make it.

(Opposite colors on the color wheel make brown and this can be a good hint:)



# Representation

The representational painter makes careful color choices, often using a vast array of colors - those he or she has mixed along with mixtures by other artists in the studio.

# Studio Thinking 8 Habits of Mind

- Develop Craft
- Engage and Persist
- Envision
- Express
- Observe
- Reflect
- Stretch and Explore
- Understand Art World



Studio Thinking 8 Habits of Mind come out of Project Zero and Harvard Graduate School of Education. Lois Hetland and Ellen Winner were the primary researchers for the project.

Going to go through these in reverse order and end with Develop Craft - have the most to say about this.



You saw an earlier slide of a cake painting inspired by Wayne Thiebaud. Here are two more, the upper one was inspired both by the poster and by the other young artists' work (the one below) hanging in the studio.

Art world inspiration comes both from within and outside the studio.



## Stretch and Explore

Encouraging kids to consider the "in between spaces" in their paintings or offering a challenge "to fill the whole page with paint" can be a good way to encourage young artists to stretch and explore.

Remember that there is an element of risk to going back to add background around a prized image or design. The adult saying "I wonder which of your colors you will try in this in-between space" is gentler than "why don't you add a background."



Reflection has to do thinking and talking about one's work and process. Here this young artist was so excited to discover the color wheel in the studio that she decided to make one of her own - pointing out ways that it was like the one it inspired.



# Observe

Painting what we see offers opportunities for careful noticing of colors, shapes, textures and finding ways to represent these with paint.



# Express

Just looking at the working table on the left, you can see paint is a very expressive colorful media that easily invites self-expression. The young artist on the right is painting her old house - a theme repeated in a series of drawings and paintings created during a 4 day workshop. She shared that she missed her house and was painting it to remember it. A great way for her to process the recent move to a new home.



# Envision

- Envision has to do with picturing what may be - what will happen when swirls and dots of paint on the left are mixed together - what colors will result from these careful combinations.
- Envision can also impact group process - how will the group fill this paper on the table - how will they work together - what will the resulting artwork look like - in this one a theme of bridges and connections (notice the lines) emerged.



The color on the left is named for how long it took to get just the right mix, 10 minute purple.

The painting above was done by a 5 year old who LOVES to mix colors. Her mother says that it is all she talks about doing in the studio - her sustained practice is a good example of how choice can allow children to specialize and develop deeper knowledge of a personal interest.



Sept, 2009



Nov, 2009



Oct 2009



Nov, 2010



March 2010

# Engage and Persist

Some snapshots of a year worth of practice mixing colors (the previous painting was done late September 2010).



This student showed persistence in a different way, taking on the task of arranging colors mixed during her class in a spectrum arrangement. She played with different orders on the table, accepted input from fellow artists and then glued the arrangement on large paper.



## Develop Craft

With painting, success depends on how we develop craft and set the routines to set children up understand routines and expectations so they can mix and paint. By setting up the structure, we can allow for independence and exploration.

# Tools for Mixing Tempera (Before)

- Sticks
- spoon (palette knife)
- Terry cloth towel
- ice cube tray palette
- newspaper bags work well to store mixed colors



This picture shows the palette with the three primaries and white - 2 spots each of yellow and white because they are the weaker colors.

With younger kids we often begin mixing with just 2 colors and white. It can be further simplified to one color and white. I find the white adds a better range of results to mixing the two primaries.

There are different schools of thought in early childhood on painting - some say to start one color at a time - just one - for at least a day and move along from there (Susan Striker, "Young at Art"). Others suggest it is important to always offer all 3 primaries and white and black so children get the full range and don't feel any color is missing Nancy Smith "Experience and Art".



## Color Mixing (after)

These 3 palettes were mixed over 3 weeks - each a limited palette of 2 primaries and white.



The reality shot - sometimes it is a bit messier!



# Menus for Color Mixing and Painting

Some menus for visual reference in the studio. Color wheel, shade and tint, strong and weak colors and different brush strokes.

To focus exploration with a group, have kids help make a class "vocabulary" of different kinds of brush strokes. Record different mark making strategies with pictures and/or just cards with marks - label and name and use for visual reference.



Set up the environment for independence,  
exploration, choice  
Set-up also communicates goals, tools, craft,  
routines

With painting, the environment can really help out as the third teacher. Look for ways to set things up to maximize independence. Make sure children know how to use tools and what to do in case of a spill.

Think of setting a table for dinner. The red cup of paint in the middle of the table is the solution to shouts of "I need more red in my palette!" The red cup has a serving spoon, young artists can add some to their personal palette and then use their tools for mixing it. We talk about asking "please pass the red" just like you would ask for something at the dinner table.



Watercolor cakes -  
allow a bit more  
independence - last  
a LONG time

There is SO much to say about painting and this slide show has mostly been limited to tempera. Here is an example of watercolor cakes in the studio (tempera cakes are similar and another option) - the big ones work well because they can be rinsed in water if they get too muddy.

These can be a good choice for a more independent painting center - there is a need for water but the paint isn't as fluid and as likely to spill.

Setting a routine would still involve instruction on adding water, washing the brush and moving from one color to another. Mixing happens more on the paper with these.



Still able to  
get colorful

A nice quality of color - enough smooth and creamy-ness for covering hands and hand prints.



Liquid Watercolor - much more fluid -  
colors mix very quickly - can be made  
from old markers.

I hadn't encountered liquid watercolors until I began reading about early childhood art. I am guessing you all may have more experience with these than I do. Beautiful vibrant color - good for mixing with eye droppers. Preschools use them on coffee filters - I never could get this to work very well for me so I use them on watercolor paper or just thicker paper. Also lovely on wood. You can make your own by pulling the guts out of dried watercolor markers and soaking in water (picture at right).



## Water Color and Oil Pastels - Resist

Watercolor and oil pastel resist is also a fun combination. Oil pastels deserve mentioning in the context of a conversation about paint because they can be a good intro to color mixing. Often on the day we mix blue and yellow, I will begin with the different blues and yellows of oil pastels and see what discoveries are made with those during drawing before moving on to paint.

Oil pastel mixes and smears nicely - also makes a lovely resist with watercolor.