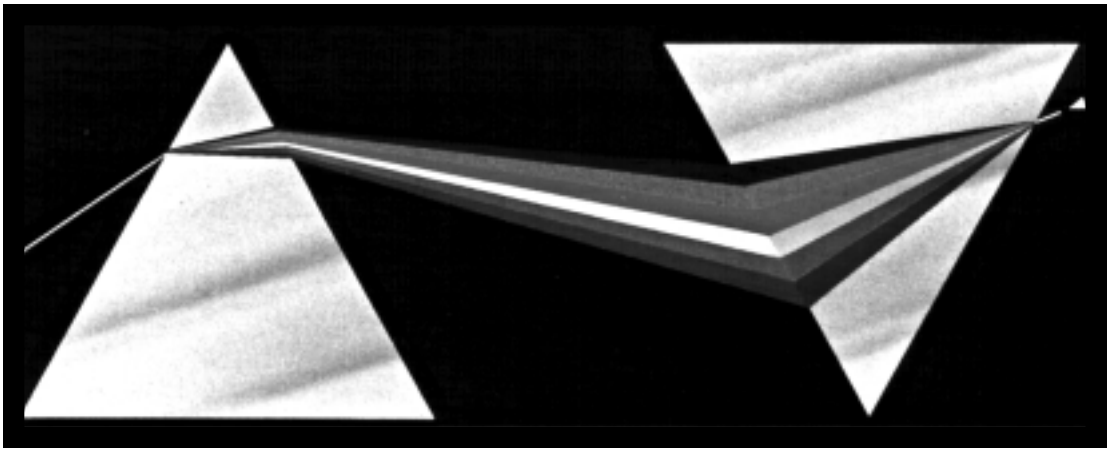
Teacher's Manual

It's Hot! It's Cool! It's Color!



Artmobile

Traveling throughout Bucks County

October 1993 - June 1994

Artmobile is a museum outreach of the Department of Art and Music of Bucks County Community College. A portion of Artmobile's general operating funds for this fiscal year has been provided through a grant from the Institute of Museum Services, a Federal Agency that offers general operating support to the nation's museums. *It's Hot! It's Cool! It's Color!* is supported in part by a grant from the Pennsylvania Council on the Arts.

ACKNOWLEDGMENTS

This exhibition would not have been possible without the generosity of all those artists who loaned pieces to Artmobile for the duration of our nine-month tour. I most sincerely thank:

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Special thanks to Deborah Jones Dominguez for guest curating this lively and informative exhibition and for writing this teacher's manual.

Many other people provided additional support for this exhibition. My heartfelt thanks to: Jack Monjar, for his assistance with the installation and for proofreading this manual; Eli Scearce, for her expert construction of many of the interactive displays; Lea Warring, for her clerical assistance with the early drafts of this manual; Terry Palenik, Computer Graphics lab assistant in the Department of Art and Music, for teaching me how to use the scanner and for so good-naturedly answering every question; and especially to the Artmobile Guides for this tour — Susan Abramson, Marissa Ashe and Susan Schneider — for their enthusiasm, hard work and belief in the value of Artmobile. It is through the efforts of our Guides that Artmobile achieves its mission of bringing the arts to our community.

Fran Orlando
Director of Exhibitions/Artmobile
Bucks County Community College
Newtown, PA 18940

My sincere thanks to everyone who has helped in putting together this exhibition. Their assistance has made it all possible.

To Fran Orlando, whose friendly support, patience, sustained interest and professionalism was so important to the completion of the project.

To my husband for providing for my computer needs and support in general. To our young daughter, who was happy that her mother was working on a project that will be seen by school children and adults.

Also to Pat Freeman, Patricia Roven, Sandi McLaughlin, Gary Mazza, Lisa Orrell, Jane Litz, Nancy Ruddle, Joanne Sodono, Ann Brown, Susan Schneider, Walter Hazzard of Topeo Gallery in New Hope and John Olman of Janet Fleisher Gallery in Philadelphia.

And last, but certainly not least, to all the artists who so graciously agreed to participate in this exhibition.

This exhibition is dedicated to all the youngsters and adults of Bucks County. I hope that you experience is enjoyable and provides some small insight into the nature and expressive qualities of color.

Deborah Jones Dominguez
Guest Curator

This manual was devised to help teachers incorporate the Artmobile experience into their curricula by providing background information and classroom activities related to the exhibition. It is intended to serve as a resource both in conjunction with and apart from the exhibition.

Artmobile is entering its eighteenth year of bringing the arts to the school children and adults of Bucks County through its visits to schools and public sites. For more information about Artmobile and its programs, please call 215/968-8432.

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INTRODUCTION

A (VERY) BRIEF HISTORY

The scientific analysis of color began with Sir Isaac Newton when he used a prism to disperse a small beam of white light into its component spectrum colors. There have been many theorists since then. Among the most famous are Johann Goethe (many writings and diagrams), Hermann von Helmholtz (additive and subtractive mixing), Adolf Holzel (color circle and writings), Michel Eugene Chevreul (simultaneous contrast), Faber Birren (functions of color), Gyorgy Kepes (various theories and history of color usage), Johannes Itten (color effects), Josef Albers (interrelationship of colors), Ostwald (color system), Munsell (complete system of color).

Color has been used symbolically, descriptively and as decoration throughout the history of painting. (See the writings of Faber Birren for coverage of this subject.) It was the Impressionists who revolutionized the way light was perceived and represented. Color was no longer blended on the palette or canvas but was instead applied in individual small dabs or marks on the painting surface. The four color printing process is a direct technological outgrowth of this artistic innovation.

Color, in it's purest sense, is a physical and perceptual phenomenon. Colors relate and therefore interact with each other. The importance of this observation became the basis for personal exploration by a master artist/teacher from Germany's famed Bauhaus. Josef Albers, and many of his colleagues, fled the Nazi regime and came to the United States to work and teach at the some of our country's great colleges and universities. Albers went to Yale where he taught classes in Color Theory, thus carrying on a long tradition begun with Sir Isaac Newton. Albers likened his work with the students to color investigations and his students were researchers like himself. The culmination of his work at Yale was publication of the monumental work entitled Interaction of Color in 1963 by Yale University Press. It contains 150 large color studies which are screened reproductions of student solutions to problems as well as text that includes a commentary and an explanation of the plates. The basis of this text is included in every accredited college program of study for art students in this country. Included in this exhibition are several topics studied by Albers and his students. They are surprising and illuminating discoveries.

As artist/teachers from the Bauhaus and their contemporaries began to investigate the functioning of color it became an end in itself. As a result artists began to use large flat areas of color, becoming the precursors of the late 20th century art movements such as Pop Art and Minimalism. (See **Some Colorist Painters** which names the greatest recent contributors to the artistic visionary use of color.)

ABOUT THE EXHIBITION AND TEACHER'S MANUAL

It's Hot! It's Cool! It's Color! is designed to inform the visitor about how and why color functions as it does as well as how artists use color in a variety of ways to create order, excitement and beauty in their work. The exhibition and this manual introduce the terms and concepts used to define and classify colors, descriptions of the variable qualities of color, ideas on altering color to create moods and visual excitement and the use of color to build the underlying structure of a piece of art. These aspects of color need to be understood conceptually in order to gain physical control of the medium. By understanding

theory and manipulating materials, a student will come to appreciate the artwork of others and begin incorporating this new knowledge into his/her own creative work. Naturally each artist develops ideas that evolve to eventually become his/her own personal color statement. Material related to color theory has been arranged here from simple to complex and can be found in the **Glossary**. The topics related to theory are presented in **Classroom Activites**.

Artmobile visitors are also provided with an opportunity to participate in several interactive displays that demonstrate some of the basic properties of color. The color perception games in Artmobile use a series of visual displays based on Albers' color exercises that challenge the viewer to see "true" color and explain why looking at color is so subjective. The varying responses provide the basis for a group discussion on perception.

Throughout the exhibition, original works of art which make use of the expressive qualities of color are presented as examples of the concepts discussed. Represented media are: painting, electronic (computer-generated) imagery, sculpture, ceramics, glass, fibers and jewelry.

When we look at the use of color by fine artists and craftspeople,we find that their concerns differ widely. Artists are often concerned with personal associations and meanings which are presented to the viewer for his/her own exploration and reaction. No doubt visitors to Artmobile will find their own personal reactions, associations and favorites among the original artwork in the exhibit. The Artmobile Guide who meets your class has been trained to answer your inquiries about each artist's approach to color. Please encourage your students to ask questions.

GLOSSARY

This glossary is arranged in order of increasing complexity of concepts.

Hue - The name of a particular color; red, orange, yellow-green.

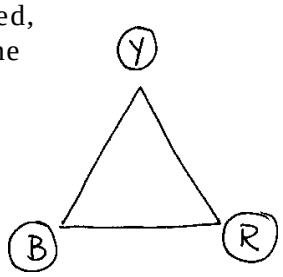
Value - The lightness or darkness of a color.

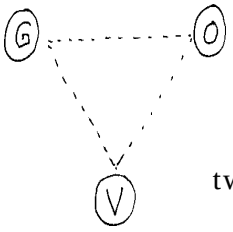
Chroma - The amount of strength or weakness of a color; the amount of purity, saturation or intensity of a color. Spectrum red is a high intensity red; brown is a low intensity red.

Tint - Any color with white added.

Shade - Any color with black added.

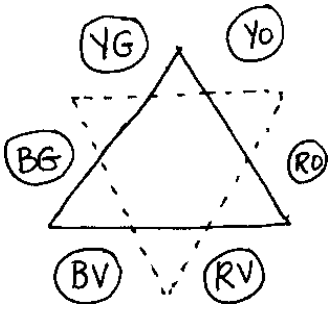
Primary colors - Red, yellow and blue; the only colors not obtained by mixing other colors. All other colors are made from the primaries.



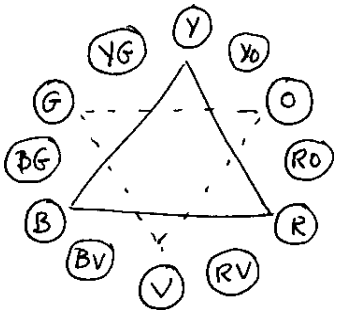


Secondary colors - Orange, green and violet (purple); the three colors obtained by mixing equal amounts of two primaries.

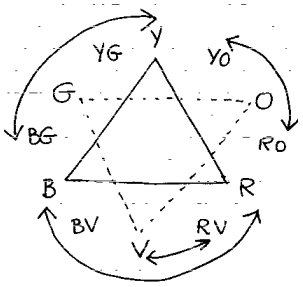
Tertiary (Intermediate) colors - Red-orange, red-violet, blue-green, blue- violet, yellow-orange and yellow-green; the six colors obtained by mixing equal amounts of one primary and an adjacent secondary.



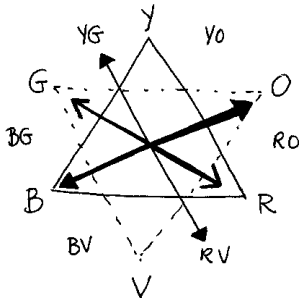
Color Wheel - Colors arranged in the order of the spectrum and laid out in a circular format. For our purposes we are using the 12 color wheel, comprised of the 3 primaries, 3 secondaries and 6 terciaries.



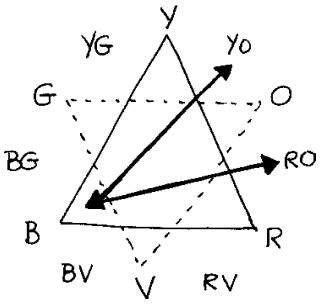
Analogous colors - These are colors that are adjacent to a key color on either side of it on the color wheel; such as red, red-orange and orange. Analagous color schemes are usually restful and lack sharp contrast. Any number of colors may be used in the arrangement as long as the color opposite the key color is not used.



Complementary colors - These are colors that are directly oppposite each other on the color wheel. One has to pass through the middle of the wheel to reach the opposite color; i.e. red-green, blue-orange, and yellow -violet, red-violet and yellow-green, yellow-orange and blue-violet, and blue-green and red-orange.



Split Complementary - An arrangement of any color on the wheel and the colors on either side of it's direct opposite; i.e. blue, red orange and yellow orange. This type of color scheme is not quite as brilliant as a complementary scheme but is still certainly very vibrant indeed.



Warm colors - Generally thought to be "advancing" colors that appear to radiate and contain red or yellow. Examples are red-orange, orange, yellow-orange, yellow, red-violet, and red.

Cool colors - These colors appear to recede, are mostly soothing and contain blue or green. Examples are blue, blue-violet, violet, yellow-green, green, and blue-green.

Triad color scheme - An arrangement of any three hues which are equally distant from each other which form an equilateral triangle on the color wheel. These are red, yellow, blue; violet, orange, green; and blue-violet, yellow-green, red-orange.

Monochromatic colors - A color scheme involving one hue, usually with different values and intensities to create visual interest; for example: light red, dark red, high intensity (brilliant) red, and low intensity (dull) red.

Achromatic colors - A hueless scheme composed of black, white and grays.

Additive Mixture - This type of color mixing is achieved by mixing or overlapping *projected* (direct) light of different colors on a white surface. In this kind of mixture the color which results from overlapped colored light is a lighter color than either of the original colors. The sum of all colors added in this way is white light.

Subtractive Mixture - This type of color mixing occurs when pigments, dyes or colors that *absorb* light are combined in a container or on another surface. We see these colors when thay are reflected off the surface. They will not result in white light because as colors are added to this (pigment) type of mixture, they become darker and grayer.

Afterimage - This is a phenomenon that occurs as a result of fatigue in the eye. According to the Young-Helmholtz theory of the physiology of the eye, there are three color receptors or sensors in the eye that enable us to see color. One is for red, another for blue and the third is for green. When the eye is overexposed to a bright color under strong light conditions for approximately one minute, the sensor for that particular color becomes exhausted and nonfunctional. When one's vision is redirected and focussed on a blank white surface, the result is that only the sensors that are *not* fatigued are still functional. Therefore, the eye sees a softly floating haze of the opposite color. For example, a person staring at orange will see a soft blue haze. Every color has an afterimage which is its' complementary color. These are:

Color	Afterimage
red	blue-green
blue	yellow-red (orange)
green	red-purple
blue-green	red
purple-blue	yellow
yellow-red	blue
green-yellow	purple

Simultaneous contrast - This takes place when two colors are seen next to each other. Both colors have an effect on each other, however the larger area of color has a greater effect than the smaller. The afterimage of the dominant color is superimposed on the smaller color as the colors are seen simultaneously.

Optical mixture - This type of mixture occurs when colors are placed *next* to each other rather than physically mixing pigments together. The afterimage of each color is perceived and mixes with the afterimages of its' neighboring colors. What we see is the average mixture of these hues, chromas and values. These afterimages actually mix physiologically in the eye and create what is called an "optical mixture".

Transparency - also called *Mixture in Paper* - This illusion results when colored papers are arranged and related in such a way that one color seems to be overlapping one or more colors and the colors underneath appear to show through the top layer of color. For example: Let's say that red is the "top" color and "overlaps" yellow, blue and violet. Where red "overlaps" yellow we see orange, where red "overlaps" blue we see violet, and where red "overlaps" violet we see red-violet. Actually there is no physical mixture of paint or color. Instead, colors are carefully chosen so that when they are placed in certain arrangements they *appear* to be transparent and overlapping.

Vibrating boundaries - This is the name given to the unusual color effect that takes place when the edges of colors meet and appear to "glow" along their shared boundary. In other words, the boundary becomes highly visible. The colors involved are always of high intensity and the same or very close values.*

Vanishing boundaries - This phenomenon occurs when the shared edge of two colors seem to disappear and the colors appear to flow into each other without interruption. The conditions for this effect include low intensity colors that are the same or similiar values.*

*If you present a lesson involving these concepts, be sure to leave the problem solving aspect of finding the correct color relationships to the students. If you give the students clues about the necessary color conditions, their sense of inquiry and satisfaction when the solution is found will be eliminated.

CLASSROOM ACTIVITIES

This manual teaches color using the Discipline Based Art Education (DBAE) method. The four foundations of this approach are: art production, art history, art criticism and aesthetics. Some of the topics listed below are adapted to various grade levels by using different approaches to the same subject. Through repeated exposure to the same concepts over a period of several years, the student reinforces and internalizes the material. The topics are related to some of the glossary entries.

The painting projects can be done using either tempera, watercolor (when specified), acrylics or oils. Tempera paint can be applied to heavy white drawing paper and illustration board; acrylics to the same or a canvas surface. Oils must be applied to a prepared canvas.

Please note that the lessons are grouped by grade levels and not all the topics are adapted to each grade level.

TOPICS FOR ACTIVITIES/LESSONS

Color schemes: Primary, Secondary and Tertiary	K - 3
Color wheel	K - 3, 4 - 6, 7 - 9
Color mixing	K - 3, 7 - 9
Warm colors	4 - 6, 7 - 9
Cool colors	4 - 6, 7 - 9
Values of achromatic colors	K - 3, 4 - 6, 7 - 9
Monochromatic colors	7 - 9
Analogous colors	7 - 9
Complementary colors	7 - 9
Color Intensity	10 - 12
Optical mixtures	10 - 12
Color and the Artist	10 - 12
Color and Culture	10 - 12
Color and Climate	10 - 12
Color and Collage	K - 3, 4 - 6
Color and Personality	4 - 6, 10 - 12
Color Palettes from the Masters	10 - 12

Classroom Activities
Grades K, 1, 2 and 3

COLOR AND COLLAGE

Fall leaf collages

OBJECTIVE: To discover and appreciate the range and intensity of color in nature and utilize them in a creative project.

MATERIALS: Leaves, paper bags for collecting leaves,reference manuals for leaves and trees, press for leaves, white glue, colored paper, table covers

Combine this art project with a science lesson and take a nature walk with the class around the school yard. Have the children collect the most beautifully colored leaves they can find. The students can even identify them by using reference manuals on leaves or trees. They need to take care not to damage the leaves and press them in their own school book for a couple of days. When the leaves are pressed and dry, the children carefully remove them from the books and lay them out on their desks to look closely at their colors and shapes. Some children may wish to trade some of their leaves. Then they choose their favorites and arrange them on a colored paper background that enhances the colors of the leaves. Once a suitable arrangement is decided on, the leaves are glued down. Hang up these beautiful collages for an incredible autumn display.

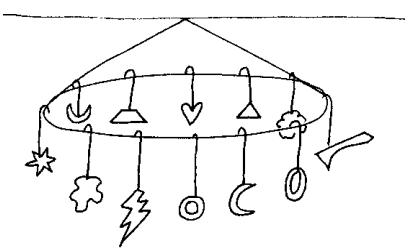
COLOR WHEEL

Create a color circle

OBJECTIVE: To introduce the concept of the color wheel using familiar objects.

MATERIALS: White drawing paper, tempera paint, paint brushes, pencils, erasers, scissors, string or colored yarns, “hula hoop” optional

Use 3, 6, or 12 colors depending on the grade level of your class. Increase the number of colors in the higher grade levels. Begin with the primary colors; red, yellow and blue, then add the secondaries; purple, green and orange, and finally all the tertiaries; red-purple, blue-purple, yellow-orange, yellow-green, red-orange and yellow-orange. One method is that each color may be represented by a painting of a fruit or vegetable painted one corresponding color on the color wheel. This could be done when children study food groups.



This activity can also be made in three dimensions. Children can bring from home up to12 small, lightweight colored objects that correspond to the colorwheel. Students hang these in the correct sequence to form a mobile. Each child can make his/her own mobile or a class mobile can be made. Objects can be hung with string or colored yarn from “hula hoops” or suspended from the ceiling to form a circle.

COLOR SCHEMES

Paintings using primary and/or secondary colors

OBJECTIVE: To introduce the elementary concepts of primary and secondary colors.

MATERIALS: White drawing paper, tempera paint, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, pencils, erasers, scissors, table covers

Have the children choose a familiar image such as the American flag, a clown, balloons, flowers, cars, etc. After the children draw their pictures lightly with pencil, they can be painted with tempera using 3 colors. Choose either red, yellow and blue (the primaries); orange, green and purple (the secondaries); or a combination of both the primary and secondary colors. In any case, keep the themes separate when they are presented to the class. For instance, during one lesson focus on primaries, another time on secondaries and lastly on both sets of colors. The individual finished pictures can be cut out and grouped by color to make a thematic bulletin board that illustrates this basic color information.

A bulletin board that shows grouped primary and secondary colors can also be developed using colored objects brought from home by the students.

VALUES OF ACHROMATIC COLORS

Gray ghosts, bunnies or elephants

OBJECTIVE: To learn through a hands-on experience and observation that mixing black and white will produce many different grays

MATERIALS: Large white drawing paper, pencils, erasers, scissors, black and white tempera paint, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, table covers

Paint three large ghostly figures, happy bunnies or large elephants that are different grays mixed from black and white tempera paint. Try to use the largest paper available to make the lesson effective. The youngsters will realize from observing each others' paintings that by mixing black and white they can make many different values of gray (an achromatic color). When the paintings are dry, the children can cut the animal shapes out of the paper. You might do this project at Halloween or Easter and either hang the pictures up around the room or else have a parade with them. How about "Animals on Parade" for the elephants?

This could also be a cooperative learning experience by having the children work in pairs. Each child would mix his/her own paint without looking at each others' grays and paint three of their own animals or ghosts. The next day, the children pick partners and put their six dry pictures in light to dark order. The class members would then look at what each pair of students made and compare the range of grays produced to their own. The gray paintings could be hung up for all to see.

COLOR MIXING

"Mix it up" colors

OBJECTIVE: To learn the basics of color mixing using primary and secondary colors.

MATERIALS: Flour, salt, cooking oil, water, food coloring, cream of tarter, medium pot, heat source, mixing bowls for dough, small plastic bags for storing mixed dough; fingerpaints, fingerpaint paper, table covers

Use this fun project for teaching color mixing with finger paints or by coloring play dough that you make with your students. You might ask for some parent volunteers to help out with making the play dough in class.

Here is a good recipe for making white play dough:

Ingredients and Tools: 2 c. white flour, 1 c. salt, 3 T. vegetable oil, 4 t. cream of tartar, Food coloring, 2 c. water, medium pot, wooden spoon, plastic bags

Getting ready:

1. Mix flour, salt and cream of tartar in a medium pot.
2. Add water and oil.
3. Add food coloring, a drop at a time, to each of three batches: one with red food coloring, a second with yellow, and a third with blue.

Cooking:

1. Bring to a boil by stirring over medium heat for 3-5 minutes. Don't worry if the mixture looks gloppy; it will turn to dough.
2. Remove from heat.
3. When the mixture forms a ball in the center of the pot, put on rubber gloves, take the dough out and place it on a floured breadboard.
4. Knead dough until it is smooth and pliable.
5. Cool completely and store in airtight plastic bags in the refrigerator. Dough will keep for several months.

Start mixing the colors by combining two primary colors at a time, i e. R + Y = O, R + B = V, Y + B = G.

Finger painting is another easy way to introduce the concept of mixing colors. Start by giving the children any two primary colors, such as red and blue. They combine them to get a secondary color - purple. Red and yellow combine to get orange. Yellow and blue combine to get green.

Classroom Activities
Grades 4, 5 and 6

COLOR AND COLLAGE

Fall leaf collage

OBJECTIVE: To rediscover the beauty and intensity of nature's annual autumn display of color and incorporate it in a visual art form.

MATERIALS: Leaves, bags for collecting leaves, leaf press or book, table cover, white glue, colored paper

One of the nicest things you can do with your students in the fall is to take a walk around the school and collect leaves after they've turned color. Have the class bring bags to collect an assortment of leaves in various colors and shapes; then press them for several days. For homework, students will lay them out on their desks at home, pick out their favorites, then bring them to school. In class have each youngster carefully arrange the leaves on a piece of brilliantly contrasting colored paper while thinking about where and how much background paper should show on the final layout. Once the design is finalized the students use white or clear glue to adhere the leaves. When everyone is finished, create a fabulous display in your classroom. This lesson relates very well to the study of ecology in science class.

COLOR WHEEL

Painting the color wheel in tempera

OBJECTIVE: Students begin to control the mixing primary and secondary colors in order to find their middle mixtures.

MATERIALS: Large white drawing paper, tempera paint, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, pencils, erasers, scissors, glue sticks (preferable), rubber cement or white glue, 3" diameter metal or plastic lids for tracing, table covers

Have the youngsters trace at least 12 circles from their lids on drawing paper, being sure that there is at least 1" of space between the circles. Then the students begin by painting 2 circles with any 2 adjoining primary colors. Then they mix those 2 colors in an attempt to get a color that is precisely in the middle between the 2 primaries. Paint that color (which is a secondary color) in a circle. Then move onto 2 more adjoining primaries and repeat the process until all the primaries and secondaries are painted in the circles.* Once this is complete then let the children move on to mixing the tertiaries. At this stage 4th and possibly 5th graders would use ready made primaries and secondaries to mix their own tertiaries, a precise middle mixture of a primary and its' adjacent secondary. 6th graders would mix their own teriaries from a ready-made primary and a secondary of their own making. However, blue-violet and red-violet should be mixed from a ready made violet plus blue or red otherwise they will look too dark. After all the colors are accurately mixed, painted and have dried, the students will cut out the circles of color and arrange them in the sequence of a 12 color wheel. Start with yellow at the top and proceed toward red as you move clockwise. The correct order is: Y, YO, O, OR, R, RV, V, BV, B, BG, G, YG. The color wheel

should appear to flow in even intervals from color to color. When the student is satisfied with the result then the circles are glued to another piece of white paper. Care should be given to the type and amount of glue used because a water base glue could cause the tempera paint to "run". Provide adequate ventilation if rubber cement is used.

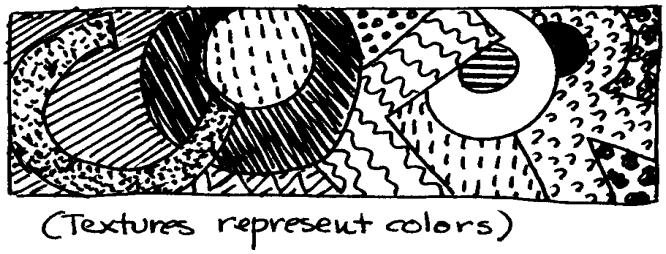
*If you find that mixing red and blue gives a violet that is too dark, students may be permitted to use a violet that is ready made from your supply of tempera. Seeing this dark violet is a valuable lesson though because it is an illustration of the principle of subtractive mixture.

COLOR AND PERSONALITY

"Your Name in Lights"

OBJECTIVE: Students find their preferred colors through the process of color mixing.

MATERIALS : Tempera paints, brushes, water for rinsing brushes, paper towels for wiping brushes, white drawing paper, pencils, erasers, rulers, table cover



Students use their favorite colors to reflect their personality. They begin by making several sketches of exciting or calm arrangements (graphic designs) using the letters of their name. A choice for best design is then made. Next they mix some colors on a separate paper and note several that they find especially interesting. The colors may be light, dark, bright, dull or any desired combination and can either "pop out" or seem to blend together. The best design is drawn lightly on the "final" paper and the letter forms and surrounding spaces are painted in using the preferred colors. This project fits in nicely with units on self esteem and feelings.

WARM COLORS

Painting using warm colors - "Pet Portrait"

OBJECTIVE: To acquaint students with the concept of warm colors and some of the many colors that can be made by mixing them.

MATERIALS: Large white drawing paper, tempera paint, pencils, erasers, table cover, brushes, water to rinse brushes, paper towels for wiping brushes

Students use a very large piece of paper to paint a picture of a favorite pet. They may start either by painting directly or sketching first. Use only colors that are "warm", meaning that they contain red, or yellow. Brown is permissable because it contains red and green (a combination of yellow and blue). If students need to make their colors lighter or darker, black or white may be mixed into the warm colors . Youngsters should feel bold and free when painting this project. Some students will make several attempts before being satisfied with a direct painting approach. When students study animals in science class, that might be a suitable time to do a cross-curricular lesson.

COOL COLORS

Painting using cool colors - "Stopping by Snow"

OBJECTIVE: To acquaint students with the concept of cool colors and some of the many colors that can be made by mixing them.

MATERIALS: Large white drawing paper, tempera paint, pencils, erasers, table cover, brushes, water to rinse brushes, paper towels for wiping brushes

A winter scene in the woods is the perfect subject for showing knowledge of colors on the cool side of the color wheel. Have students portray a stormy or wintery looking sky and the purply-blue shadows of the trees. Questions to ask the class may include "How would you make the snow look really cold ?" . . . "What color would you add to the white?" . . . "Would you add a little or a lot ?" This is a great way to relate art and poetry. See the work of Robert Frost for the poem mentioned above.

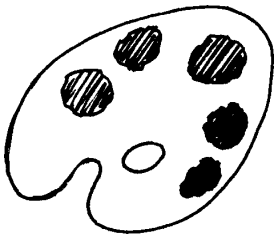
VALUES OF ACHROMATIC COLORS

Gray scale

OBJECTIVE: Students begin to control mixing black and white in order to achieve specific grays.

MATERIALS: Black and white tempera paint, white drawing paper, paintbrushes, water for rinsng brushes, paper towels for wiping brushes, pencils, erasers, rulers, table cover

Mix 5 different grays using black and white paint. The grays should cover the range from very light to very dark. Present the grays the way an artist arranges his paints on a palette.



Save the gray palette. Then paint a picture of something that is, or was, gray (like a suit of armor, etc.). Be sure to use all five grays in the painting. Present the painting with the palette and compare the two. Note: Mix and save enough of each gray value to complete both the palette and painted object. It is too difficult to try to match a dried gray if the student runs out of it. This is a good project to tie in with a history or social studies lesson on the Middle Ages by illustrating armor and castles, or a science lesson on Outer Space with a painting of the moon.

Classroom Activities
Grades 7, 8 and 9

MONOCHROMATIC COLOR AND COLOR MIXING

Monochromatic Painting

OBJECTIVES: To learn how to mix tints, shades and intensities of one color.

MATERIALS: Tempera paints, paintbrushes, small storage containers for paint, water for rinsing brushes, paper towels for wiping brushes, white drawing paper, pencils, erasers, rulers, table covers

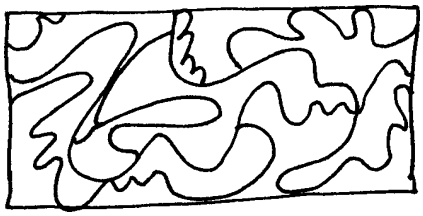
Students begin by making several pencil sketches of designs comprised of both freeform and geometric elements. Sizes to be considered are 9" x 12", 11" x 14", or 14" x 17". Then they choose the best design and transfer or copy it lightly in pencil onto the final paper. Next have the students choose one color on which to base their painting. They need to experiment on sketch paper with mixing various shades, tints and intensities of that color. Depending on the complexity of their final design, the students should decide how many "colors" within that monochromatic scheme are needed for the most effective colorization of their image. Five to seven colors is usually enough to make a piece work visually. Next they do a quick color layout for placement in the design. Then the students mix up an adequate supply for the painting of each "color" and put the paint in the storage containers. The final step is to have the students paint in the shapes.

ANALOGOUS COLOR, COLOR MIXING AND WARM OR COOL COLORS

Analogous Painting

OBJECTIVES: To learn what analogous colors are as well as how to mix their tints.

MATERIALS: Tempera paints, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, white drawing paper, pencils, erasers, rulers, table covers



This is the second part in a series of projects. The methods are similar for each with slight variations. Students begin by making several pencil sketches for a design comprised of free flowing lines that form closed shapes. This project works well if the students create stencil shapes that can be used in place of the freeflowing lines. If stencils are used then they can be overlapped to create the imagery. Some of the overlapped lines can erased be in order to create a pleasing look. Sizes can be 9" x 12", 11" x 14" or 14" x 17". Then choose the best design and transfer or copy it lightly in pencil onto the final paper. Next have the students pick three analogous colors that are on either the warm or cool side of the color wheel and paint them on sketch paper. If the students like the way the colors look, have them mix several tints for each color and put those on the sketch paper as well. Usually two or three tints for each color is adequate for this project. Students then analyze their final designs and decide which tints to include. All three colors and their (several) tints are required in the final composition. The next step is to mix and store enough of each color to complete the final painting. Last of all is to finish painting the design.

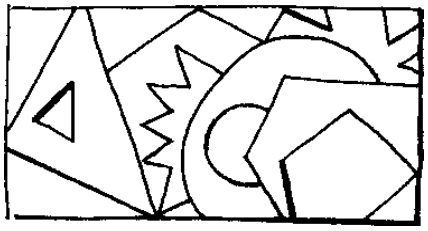
COMPLEMENTARY COLOR AND COLOR MIXING

Complementary Painting

OBJECTIVE: To learn about complementary colors, their tints and shades.

MATERIALS: Tempera paints, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, white drawing paper, pencils, erasers, rulers,table covers

This is the third in the project series. Here the students begin with several pencil sketches that utilize only closed geometric shapes. Sizes of the images are either 9" x 12", 11" x 14" or 14" x 17". When a satisfactory sketch is made, then it is transferred or redrawn lightly in pencil on the final paper. Then the students begin their color explorations by choosing two complimentary colors , mixing several of their tints and shades, and presenting them on sketch paper. After looking over their design, they can decide where the full strength colors, tints and shades will be placed in it. The palette should be limited. Mix up an adequate supply of paint in storage containers and then finalize the design by adding color.



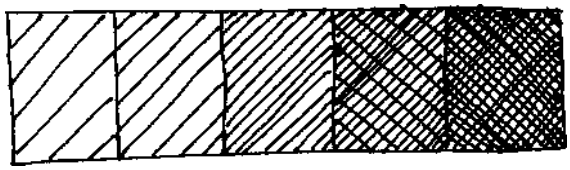
VALUES OF ACHROMATIC COLORS AND COLOR MIXING

Black to White Painting

OBJECTIVE: To gain greater control of mixing black and white paint in order to create grays.

MATERIALS: Tempera paints, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, white drawing paper, pencils, erasers, rulers, table covers

Students start by working up several pencil sketches using the letters of their name (first, surname or both) as design elements. The size of final image is 6" x 18". They may use all upper case or lower case, or a combination of the two. The sizes of the letters can be varied also. The letters may remain legible, or be turned and shifted so that they are combined in an interesting and exciting arrangement. After exploring the letter forms for a while, the students can choose their best composition to transfer or copy using light pencil lines onto the final paper. Then the students begin their work with black and white paint to mix five different grays. It is very important that mixing begins with the white paint. Black is added to the white almost a drop at a time because the black can overpower the white very quickly. The grays should be evenly graduated from light to dark. During the exploration stage of mixing the grays, the students need to make a scale of 1" x 1" squares (drawn on paper with pencil) that can be painted with the graduated color and kept for comparison with the final painted project. Once the values are decided upon, then students mix and store sufficient quantities of each gray to complete the painting. The final step is to paint the design, filling in all the shapes including the background, since that is an important element in the overall look of the piece.



COLOR WHEEL

Painting the color wheel with watercolors

OBJECTIVE: To gain some control of mixing watercolors while maintaining color intensity.

MATERIALS: Watercolors, watercolor or white drawing paper, pencils, erasers, watercolor brushes, water for rinsing brushes, paper towels for wiping brushes, table covers

This is a great way to make a connection between art and math class - especially a geometry lesson. The students need to plot out where to place points for the 12 colored circles that construct the large wheel. Draw very lightly with a pencil; the colors, not the drawing, are important. First divide a large circle into thirds, then divide the thirds in half. After that, mark the halfway point between each of those points. Around each point, students trace a round object approximately 2" on paper with a pencil. This is repeated until there are 12 circles. Then the student proceeds with painting each circle one of the colors of the color wheel. Be sure students mix only a little bit of water with the colors, otherwise they will be too pale. Brushes must be carefully rinsed before using a new color. Begin with the three primaries, R, Y, B. Then mix two primaries to create each secondary, R + B = V, R + Y = O, B + Y = G. Finally, mix a primary and an adjacent secondary to create each of the six tertiaries, R + V = RV, R + O = RO, etc. The finished color wheel will be comprised of 12 brilliantly colored transparent disks evenly spaced around a large circle on a white background.

Classroom Activities
Grades 10, 11, and 12

OPTICAL MIXTURES

The Four Seasons Pointillist Painting

OBJECTIVE: To understand the concept of optical mixtures by creating several examples.

MATERIALS: Tempera paints, white illustration board, brushes, water for rinsing brushes, paper towels for wiping brushes, white drawing paper, pencils, erasers, rulers, right angle triangles, table covers

This project relates well to studies about France during the late 19th century; especially the effects of industrialization. These are four small paintings that rely solely on color effects for expression. Have the students use a light pencil line to draw 4 squares that are each 4" x 4" surrounded by a 1" border on each side. This will be the final painting surface. Then the students divide a piece of sketch paper into 4 quadrants, labeling them "winter", "spring", "summer" and "fall". In each quadrant colors are mixed and noted that approximate the colors that are associated with each season. Next the work begins on the final painting. Each square is filled with colors that are applied using very small strokes which only touch the tip of the paintbrush to the surface. The areas of the individual squares are totally filled with tiny dots of colors that correspond to each of the seasons. It should be very clear as to which season is represented by a particular color feeling; in other words color alone conveys the message.

COMPLEMENTARY COLORS

Old Master Remake

OBJECTIVES: To analyze colors and mix their complementary hues, values and intensities.

MATERIALS: Acrylic paint, white illustration board or canvas, oil paints (optional), and canvas (optional), brushes, water or turpentine for rinsing brushes, paper towels for wiping brushes, either tracing or drawing paper, pencils, erasers, table covers, easels (optional)

This lesson is partly research and partly painting. Students use the library or art class library and look through books on artists from the past. After some research, they pick an artist whose work they admire as well as a particular painting done by that artist. Students will need to refer to the painting as they are working on their own remake, so they must be able to borrow the book. They are to choose an interesting section of that painting which they will make an enlarged, simplified copy / version of onto either illustration board or canvas. Next, the original painting section must be generally analyzed for color. Considerations are hues, chromas, and values. Color sketches of the original are made on paper and the complimentary colors are shown along with the analysis. After some adjustments are made the student then begins work on his / her complimentary painting. Keep all preliminary work for this project. It is quite interesting to see the development of the assignment.

COLOR AND PERSONALITY

Self Portrait in Pure Color

OBJECTIVE: To find one's personal favorite colors through experimentation.

MATERIALS: Tempera or watercolors, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, white drawing paper, pencils, erasers, rulers, table covers

Students draw a 7" x 7" grid comprised of 1 inch squares. The pencil lines must be very light so as not to interfere with the colors. Next, student start mixing their favorite colors on sketch paper. Some time should be devoted to this activity because people usually start out by picking colors that are in currently in vogue or seen in pop culture. It takes some exploration and experimentation to find one's true colors. When this happens then the student is ready to begin filling in the squares with his/her personal colors. Obviously choices of colors are not restricted, so virtually all hues, chromas and values may be represented in the individual grids of each class. Some students may not wish to share this personal statement with other members of the class and their wishes should be respected. No analysis of personalities should be undertaken. It is simply interesting to note the differences in color choices among class members.

COLOR AND CLIMATE

Paint the House

OBJECTIVE: To discover what colors are and have been used by the peoples in places around the world.

MATERIALS: Paint (tempera, acrylic or oils), water or turpentine for rinsing brushes, paper towels for wiping brushes, white drawing paper or canvas, easels (optional), pencils, erasers, table covers, reference: geography and travel books showing different countries and their climates

A project that ties in with studies of people around the world, even a science class on weather and climate. After looking through some books showing how people live in different parts of the world, students choose a topic from this offering: The Tropics, A Northern City, A Greek Island, An African Village, High in the Mountains. If students have another idea, you may wish to consider it. The assignment is to have the students paint a picture, based on their research, of a house in a certain climate. What colors would the house be painted in such a place? What might the surroundings look like? The students may need to lightly sketch the composition before they begin painting.

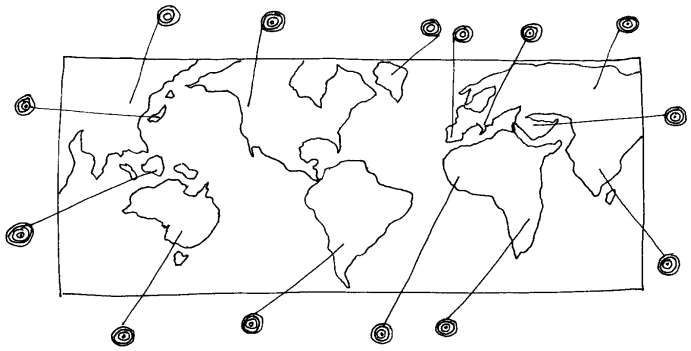
COLOR AND CULTURE

Color "Mapping"

OBJECTIVE: To research how and why various cultures used color in the past.

MATERIALS: Reference book showing a map of the world, reference books on the art of different cultures, i.e. Islamic, Chinese, Japanese, Indian subcontinent, South East Asia, African, Native American, Indigenous Peoples of Central and South America, Peasant Peoples of Europe, Mediterranean Peoples,European Royalty, etc.; tempera paint, paintbrushes, water for rinsing brushes, paper towels for wiping brushes, pencils, erasers, compasses, table covers, map pins, yarn

This is an interesting project for cooperative learning as well as a lesson that lends itself nicely to a class in World Cultures. Students work in pair or small groups to research various cultures listed above, (others not listed are also acceptable), with the goal of finding out what colors were used by the people in their arts and craft work. After looking at tilework, ceramics, folk costumes, ceremonial dress and ritualistic body coverings, masks, toys and puppetry, handmade fabrics, etc. one begins to see a pattern in their use of color.



Students make "notes" on their chosen culture by using tempera paint on sketch paper. Later they organize this information by drawing concentric circles on paper and carefully painting these colors in the circles . These colored disks are placed with map pins on a world map that is hung on the classroom bulletin board. The size of the disks depends on the size of the world map you are using. Instead of this arrangement, you may wish to place the disks beyond the edges of the map and use colored yarn to connect the geographic location to the corresponding color disk. This gives a "zoom out" look to the display.

COLOR AND THE ARTIST

Paint a Palette

OBJECTIVE: To understand how some painters have used color.

MATERIALS: Books that show large reproductions of artists' work (survey books or monographs), acrylic, oils or tempera paints, water or turpentine for rinsing brushes, paper towels for wiping brushes, pencils, erasers, white drawing paper or canvas.

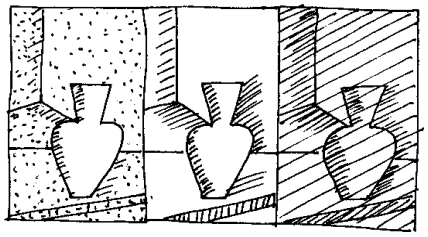
Students research several artists from the list of colorist painters in this manual. Then they find to a particular artist whose paintings they enjoy and explore that artist's use of color in that work. Exploration of the color is done by mixing paint on paper or canvas until the student feel he/she has a grasp of the kinds of hues, chromas and values the artist was using. The final outcome of the lesson is the presentation of the color explorations, a reproduction of the painting and a representation of what he/she thinks the artist's palette for that particular painting would have looked like.

COLOR INTENSITY

Morning, Noon, and Night Triptych

OBJECTIVE: To use color to create the feeling of light during three different times of day.

MATERIALS: Pencils, white drawing paper, erasers, acrylic paint or oils, paintbrushes, water or turpentine for rinsing brushes, paper towels for wiping brushes, paper, illustration board or canvas.



Students make preliminary sketches for a scene of their choice. This scene will be painted three times with different colorings, each representing a different time of day; morning, noon and night. Careful consideration must be given to the quality of light at these times; soft, bright, and dim. This will be reflected in the way the colors are mixed and applied. Keep the scene simple, perhaps a corner of a room or a still life. When the paintings are finished they are supposed to be attached or at least hung very close together to create the special effect that simulates the passage of time and change in light quality.

COLOR PALETTES FROM THE MASTERS

Color Mosaics

OBJECTIVE: To understand how some artists have used color.

MATERIALS: Magazines with color photography /illustration, rubber cement or glue sticks, white drawing paper, scissors, envelopes, art books with illustrations of antique mosaics from Pompeii, Ravenna, Rome, Hagia Sofia, Istanbul, etc.

This project relates beautifully to history and archeology lessons on the ancient Greek and Roman world. The final result of the project is visually beautiful but students need to be cautioned against getting too ambitious with a large a section of the mosaic. An archeological fragment from history is a more likely metaphor for this assignment. This is enough to give them a sense of just how complex color really is. Students begin collecting color magazines at least 2 months before the actual classwork begins on this project. As they collect the magazines they need to start cutting out the colored parts of the magazines and categorize them by color. A suggestion for this is to have 8 legal sized envelopes, one for each primary and secondary color: R, Y, B, O, V, G as well as Black and White. In the meantime, the students are researching antique mosaics with the goal of finding a particular work that is of interest to them. After selecting one, they pick an area of the mosaic which they will reproduce color for color with small pieces of magazine color. The way to prepare for this is to make a light pencil tracing of the desired section of the mosaic on tracing paper. Use graphite or carbon paper and a ball point pen to transfer that image onto white drawing paper. Make the copy faint so that the carbon will not interfere with the final image. Then pick a shape in the original to begin with and try to duplicate that color with a piece of the magazine paper. The student can use the tracing paper which shows all the outlines of the original shapes and put it on top of the magazine color. By tracing the outline an indentation will be pressed into the magazine color that can be seen well enough to be used as a guide for cutting out that shape. Glue that shape down on the white paper and then go on to the shape. Shapes may have to be subdivided in order to follow changes in color within the shape. When all the shapes are completed the magazine mosaic will have quite a charm of their own. You may wish to display these “archeological finds”.

ADDITIONAL READINGS AND VIDEOS

*Albers, Josef, Interaction of Color, New Haven and London, Yale University Press, 1963.

*Birren, Faber, Color for Interiors, Historical and Modern, New York, The Whitney Library of Design, 1963.

Birren, Faber, Color Psychology and Color Therapy, New Hyde Park, New York, University Books, 1961.

*Birren, Faber, History of Color in Painting, New York, Reinhold Publishing Co., 1965.

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*Itten, Johannes, The Art of Color, New York, Reinhold Publishing Corp., 1961.

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Katz, David, The World of Colour, London, Paul Kegan, 1935.

*Kepes, Gyorgy, Language of Vision, Chicago, Paul Theobald & Co., 1944.

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Kodak, Eastman, Color as Seen and Photographed, New York, Rochester, 1966.

*Munsell, Albert H., A Color Notation, Baltimore, The Munsell Color Co., 1905.

*Newton, Sir Isaac, New Theory About Light and Colors, Munich, W. Fritach, 1967.

Ostwald, Wilhelm, The Ostwald Color Album, London, Winsor & Newton, 1933.

Rainwater, Clarence, Light and Color, New York, Golden Press, 1971.

Sidelinger, Stephen J., Color Manual, Englewood Cliffs, New Jersey, Prentice-Hall, 1985.

Wright, W., Research on Normal and Defective Colour Vision, London, Kimpton, 1946.

VIDEOS - for older high school students (please preview)

Basics of Color, Color Energy, Color Structures, From Black to White, Discord Energy, Color in Nature, Living with Color - Part One, Living with Color - Part Two, Color Light - All from Arts & Humanities 1993-94 Video Catalog, RMI Media Productions, Inc., 2807 West 47th Street, Shawnee Mission, Kansas 66205, (800) 745-5480

RELATED BOOKS - for older high school students (please preview)

Elements of Color - Course Textbook, Eye & Brain, Color: An Introduction - Course Manual, Universal Prints Booklet, Color: An Introduction - Student Workbooks for Units 1-8, Color : An Introduction Reference Manual - All from Arts & Humanities, see above

* Indicates most important works

SOME COLORIST PAINTERS
A SAMPLING FROM RECENT ART HISTORY

Josef Albers
Karel Appel
Richard Anuskiewicz
Pierre Bonnard
Mary Cassatt
Paul Cezanne
Marc Chagall
Edgar Degas
Robert Delauney
Sonia Delauney
Helen Frankenthaler
Paul Gauguin
Hans Hofmann
Wassily Kandinsky
Paul Klee
Gustave Klimt
Henri Matisse
Piet Mondrian
Claude Monet
Pablo Picasso
Odilon Redon
Pierre Auguste Renoir
Bridget Riley
Mark Rothko
Georges Rouault
Georges Seurat
Henri de Toulouse-Lautrec
Joseph William Turner
Vincent Van Gogh
Victor Vasserely
Jean Vuillard

SOME RECENT MOVEMENTS IN ART HISTORY CONCERNED WITH COLOR

Impressionism
Post Impressionism
Pointillism
Fauvism
DasBlau Reiter
Modernism
Contemporary

OTHER SOURCES OF INSPIRATION FOR USING COLOR

Stained glass windows of Gothic cathedrals
Indian and Persian miniatures (jewel-like paintings)
Byzantine mosaics
Japanese Ukiyo-e color woodcuts