

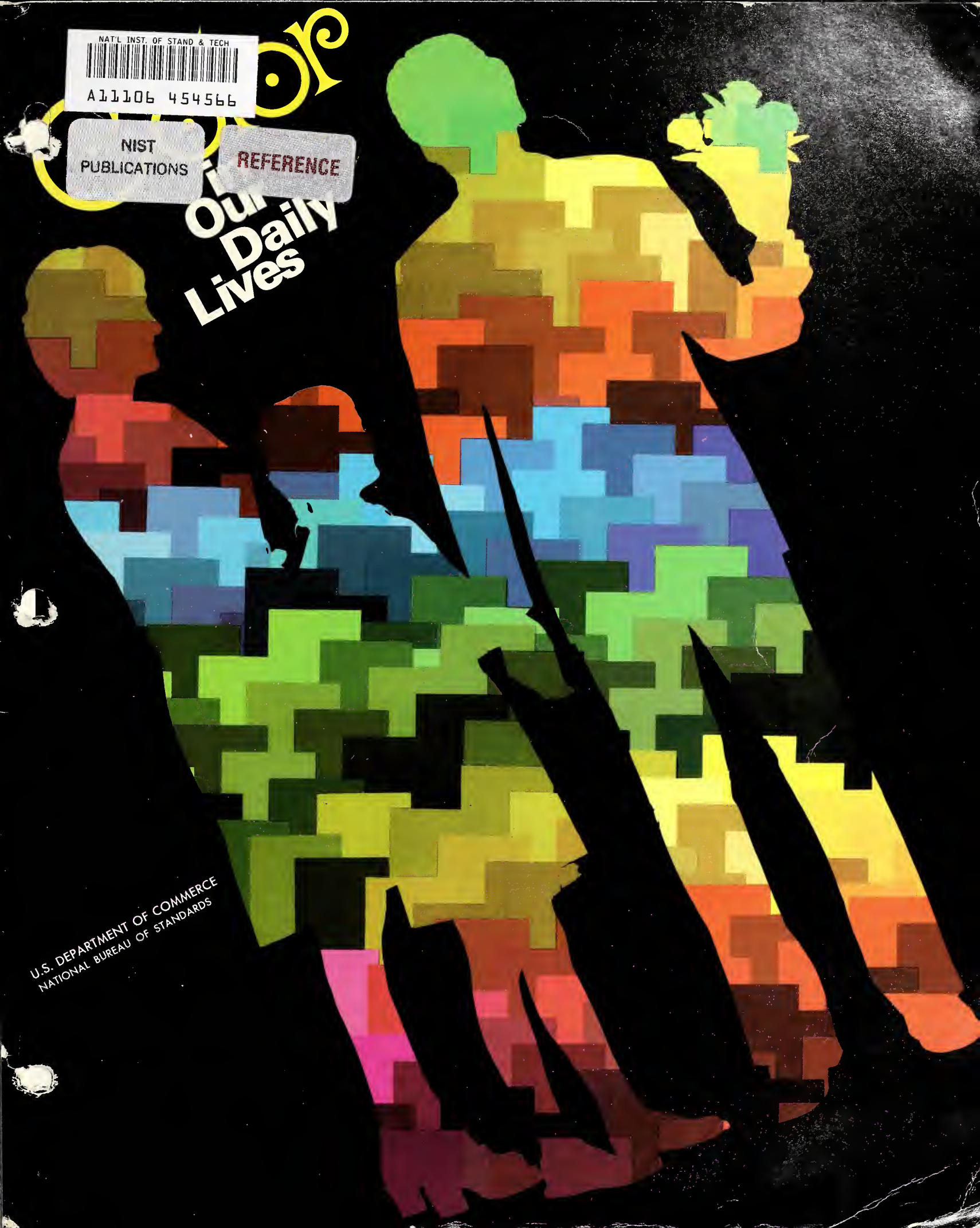
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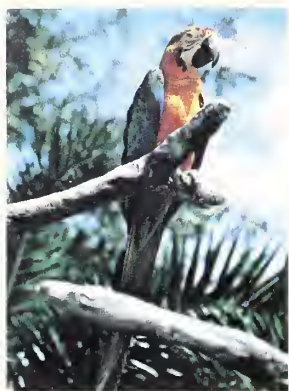
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USES OF COLOR

The practical uses of color are many and varied. Color-coded traffic signals tell us when to go and when to stop; the color of certain foods gives us a clue as to their freshness; color points things out, helps to hide things, distinguishes one thing from another. Without color our lives would be less interesting and, under some conditions, more hazardous.

But of all the benefits of color, perhaps the one most valuable to us is the use of color to make people, clothing, and homes more beautiful. The use of color not only affects our mood and spirit, but also tells others something about ourselves—about our tastes, even about our personalities.

Pleasing and effective use of color is achieved mostly through experience, but our sense of color and color relationship can be sharpened by learning more about the fundamental ways that colors go together. This booklet is designed to do just that. The principles governing color relationships and color use are explained in part by words, but more importantly by carefully designed illustrations. The goal is to help you *sense* color and *feel* color relationships so that you will know more clearly what colors are “right” for you. Study the illustrations and charts carefully. Then, look for these same color effects in your own environment—in your home or workplace, and in nature. By developing a feeling for color, you can make color work for you.

In order to appreciate color and use it to enrich your life, it is not necessary to understand the scientific principles of color, nor how light and objects interact to produce color. You need only understand how colors relate to one another and how to use these relationships effectively.



COLOR AND LIGHT

Color comes from light. Sunlight is a mixture of many colors, as anyone who has watched a rainbow clearly knows. Prisms, diamonds, or lenses will produce similar bands of color from white light. Only certain vivid colors—red, orange, yellow, green, and blue—are visible in the rainbow. Other colors can be obtained by mixing these rays in various proportions by use of optical devices.

Most objects owe their color to substances that are found in them or on them called *colorants*; these colorants modify the light in various ways. If an object appears black, this means that the colorants in the object have absorbed all or most of the light and reflect little. On the other hand, if most of the light is reflected the object will appear white. All of the other colors of objects are due to the many ways in which the various colorants modify light by selective absorption or reflection.





Families of Color: Hues

From the millions of different colors that most people can distinguish, it is possible to select samples which belong to a group for which a common name is available; for example, "yellow" or "blue."
These basic families of colors are called *hues*.

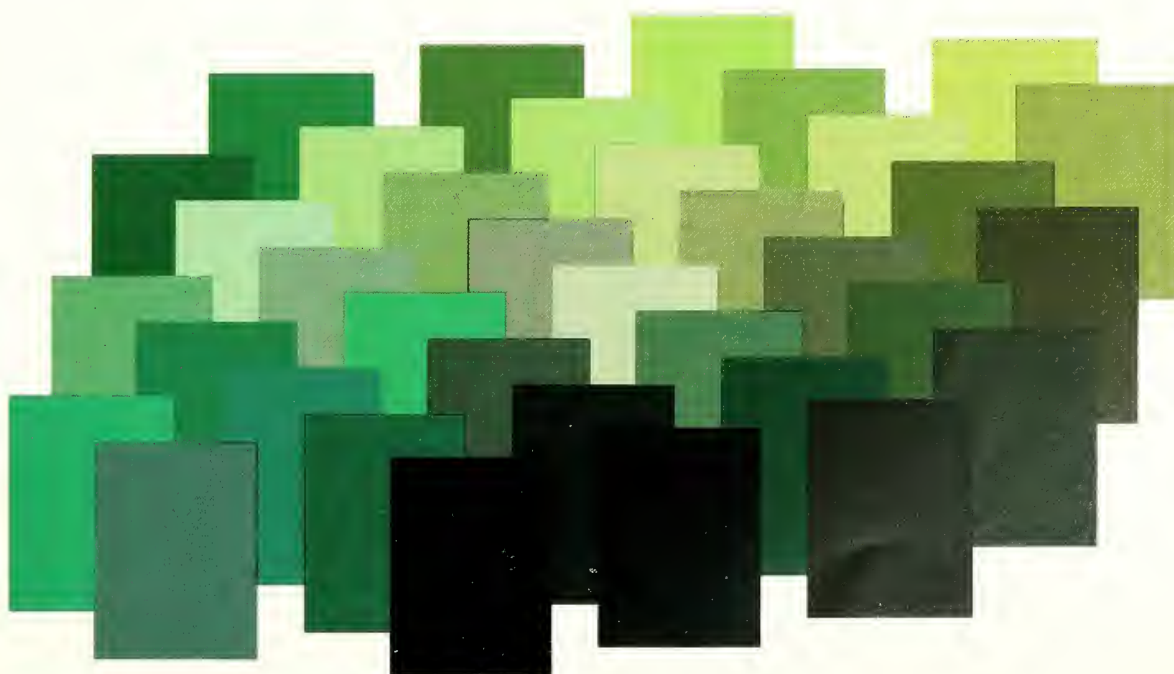


REDDISH COLORS (Family of red colors)





GREENISH COLORS (Family of green colors)





BLUISH COLORS (Family of blue colors)





YELLOWISH COLORS (Family of yellow colors)



Families of Color: Light/Dark—Vivid/Grayish

In addition to families of hues, we have families of *light* colors and families of *dark* colors. The samples below illustrate the way in which these colors relate to each other. Similarly, the samples on the opposite page illustrate families of *vivid* colors, and families of *grayish* colors.

To describe any color, therefore, you have to be aware not only of its hue, but also of its lightness and darkness, and its vividness or grayishness. These relationships are illustrated still more clearly on the following pages.

DARK COLORS (Family of dark colors)



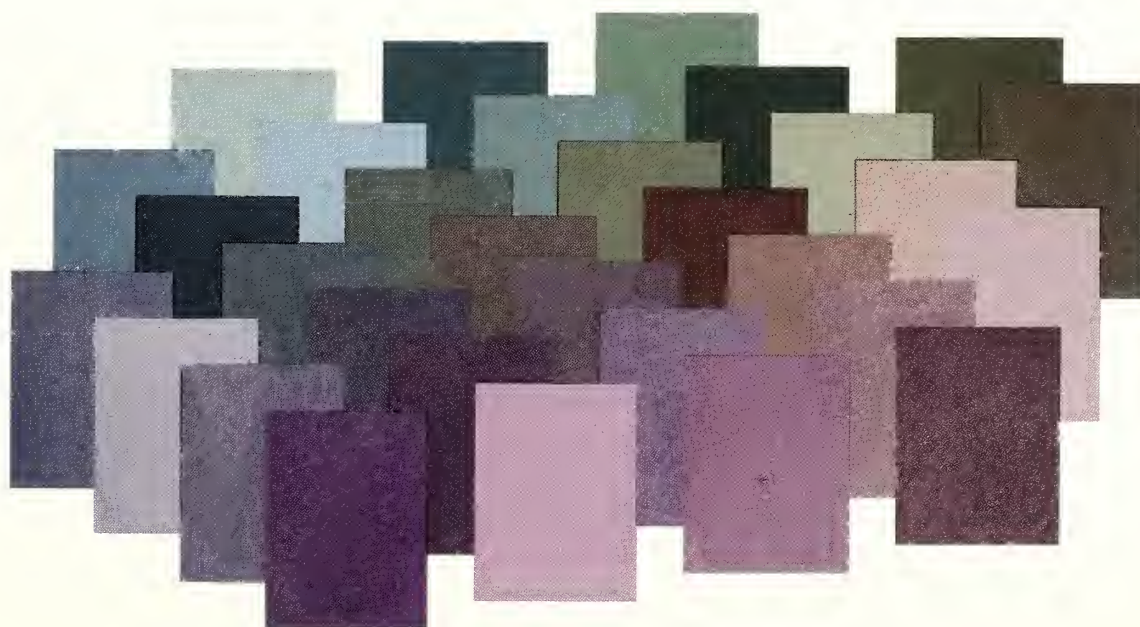
LIGHT COLORS (Family of light colors)



VIVID COLORS (Family of vivid colors)



GRAYISH COLORS (Family of grayish colors)



Color Relationships: **Hues**

The vivid colors from page 9 have been arranged in a closed ring shape to show their relationship. Notice that each sample seems to “belong” between its neighbors.

The “color solid” diagram on the opposite page shows graphically how these related colors vary among themselves in hue, lightness/darkness, and vividness/grayishness.



Color Relationships: Lightness and Vividness

In this "color solid" diagram, each horizontal grouping of spheres represents a *lightness* level, with the lightest at the top and the darkest at the bottom. At each level, six *hues* are illustrated by spheres arranged along paths like the spokes of a wheel. Along each spoke, *vividness* of the hue increases as you move outward from the central grayish sphere.

As you examine the relationship of the colors on these two pages, you begin to get a feel for the colors which seem to "belong" together.



CHARTING COLOR RELATIONSHIPS

The color charts in this book can give you a sense of the natural relationships among colors. The groups on page 13, for example, show the way in which certain members of the “red” family relate to each other—colors you may find in a lipstick, a scarf, or a tie. The upper group is the most vivid; the middle group is slightly grayish; the bottom group is considerably grayer. Hue variations run from yellowish-red on the left to bluish-red on the right; lightness variations in each group are shown up and down, with lighter colors at the top, moving to progressively darker colors at the bottom.

The charts on pages 14-15 display the basic colors for many natural materials such as sand, stone, wood and plant fibers. By matching the color of the object to the color on the page you will find that you “see” the color of the object more clearly as it relates to the colors around it.

The eight color groups become progressively darker from the upper left-hand corner of page 14 to the lower right-hand corner of page 15. Each of the eight groups varies from yellowish at the top to reddish at the bottom. Variations from left to right in each group show changes in grayishness.

These charts can also be used as an aid in developing your personal color plan. Find the color that most nearly matches your skin color, and use it as a basic reference for selecting the colors in your wardrobe and—if you are a woman—your cosmetics. For an explanation of how you can use this skin color in selecting clothing and cosmetics, see pages 22-23.





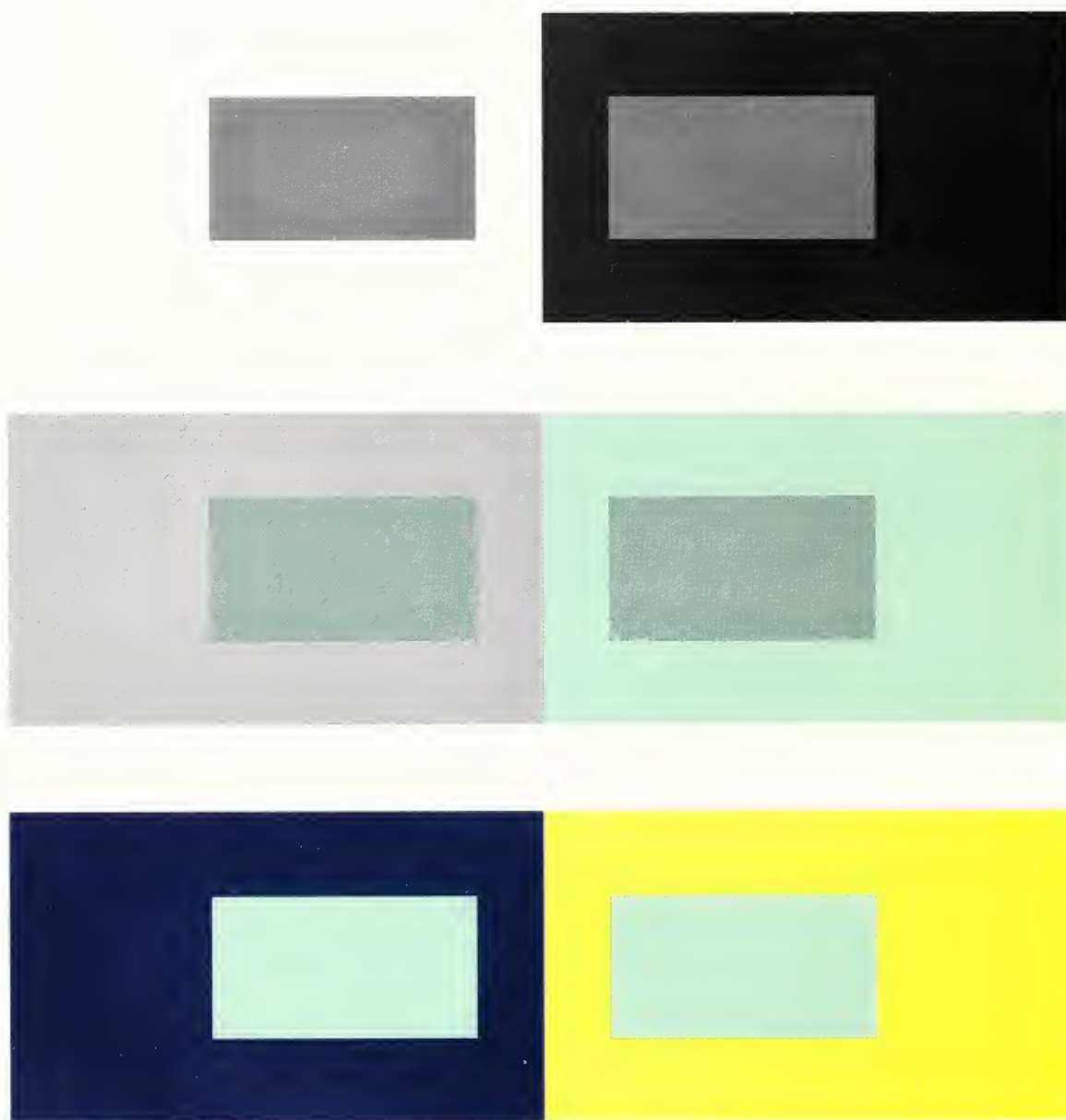




COLORS INFLUENCE OTHER COLORS

The Same Color May Appear to Vary in Lightness and Grayness

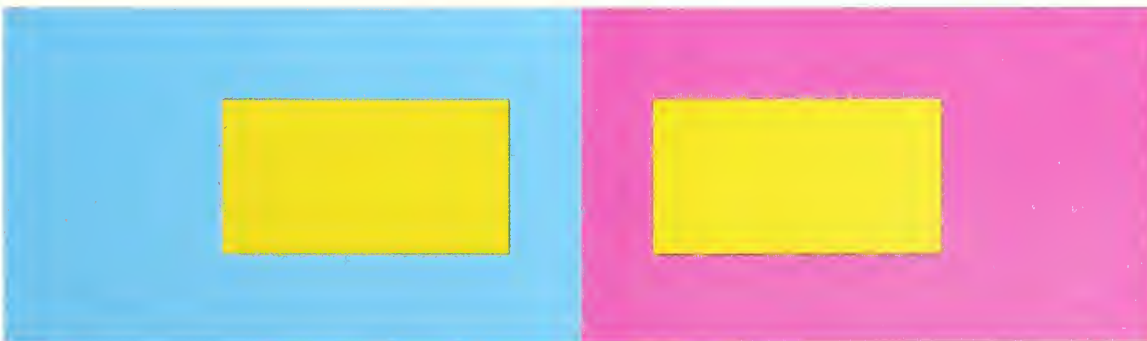
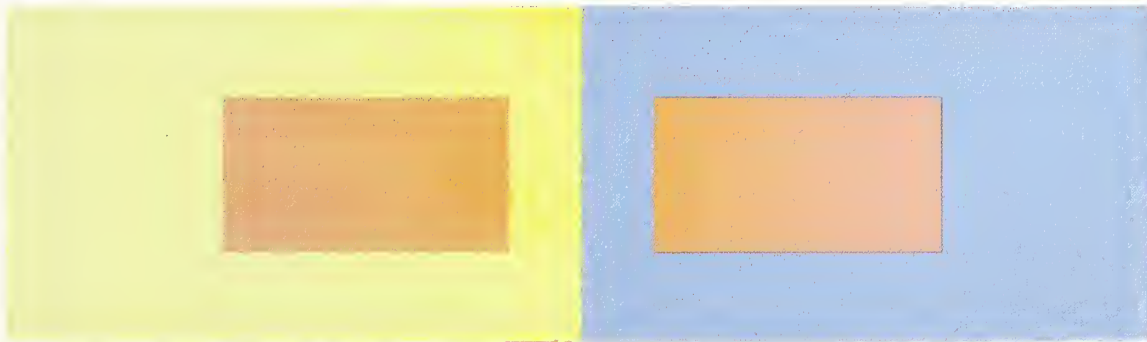
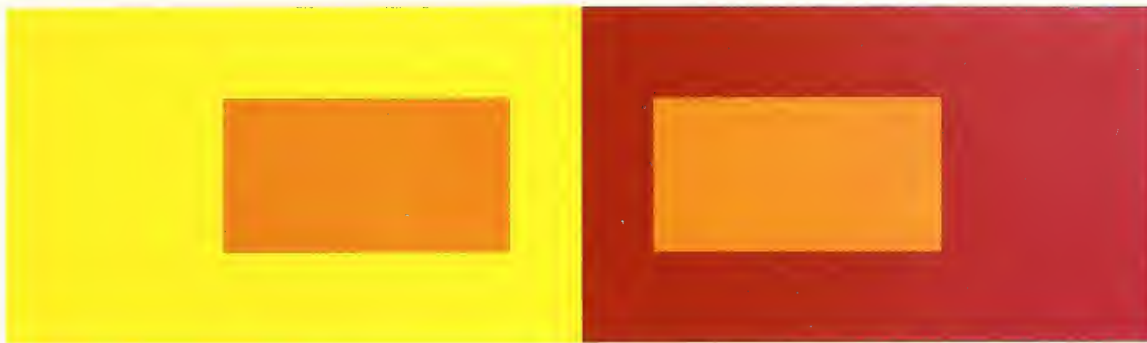
Every color is influenced by the color next to it. Whenever colors are brought together which differ in any respect, their differences appear greater. The panels on these pages show this effect. The smaller rectangles in each pair are the same color. (Check by masking.) In the upper pair on this page the inner gray panel appears darker on the light background and lighter on the dark background. In the middle pair the inner green appears less gray on the gray background and more gray on the green background. In the lower pair the inner green appears both lighter and yellower on the dark blue background and darker and bluer on the yellow background.



Identical Colors May Appear to Vary in Lightness and Hue

In the upper pair on this page the inner orange panel appears darker and redder on the yellow background and lighter and yellower on the red background. In the middle pair the inner beige appears darker and redder on the green background and lighter and yellower on the blue background. In the lower pair the inner yellow panel appears slightly redder on the blue background and slightly greener on the magenta background.

These induced color effects are ever present and are of greater or lesser extent depending upon the particular situation. These induction principles are helpful when a fixed or existing color must be presented in the most favorable way through choice of a new surrounding color or group of colors.



COLOR HARMONY

Lightness Variations in a Single Hue

When colors seem to belong together, and produce pleasing effects when combined, they are said to *harmonize*. Harmony comes from a choice of colors whose composite effect is acceptable to the viewer in the particular situation. The simplest and most readily acceptable color differences occur as shadow or highlight effects. For example, a textured fabric may owe its visual interest to the variations in shading due to the texture. The same is true for a ceramic object of a single color glaze where its particular form and shape become evident due to the shade variations produced by the illumination. Color variations due to this kind of shading are essentially lightness variations of the basic color.



Harmony Using Neighboring Hues

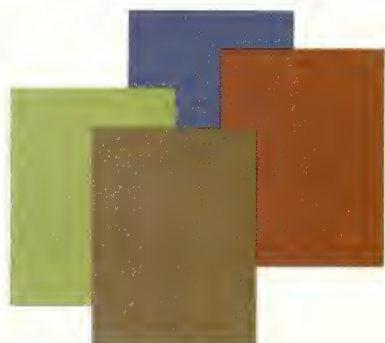
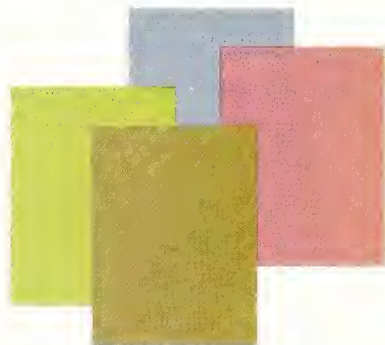
Basic color variations in lightness are shown in the left column on the opposite page. Greater contrasts within a single hue lead to the examples in the right column on the same page.

Another kind of harmony results from using neighboring hues with appropriate lightness differences. Examples of this type are shown in the left column of this page. Further expansion of the hue range leads to the examples shown in the right column on this page.



Harmony Can Create Different Moods

The six examples of color combinations on this page have essentially the same hue relationships. The horizontal pairs have similar lightness; the left column appears more grayed while the right appears less grayed. The moods created by these combinations vary greatly. Some are quiet and restful, others are active and cheerful, or dramatic and startling. The suitability of any of these groups for a particular use depends upon the effect desired.

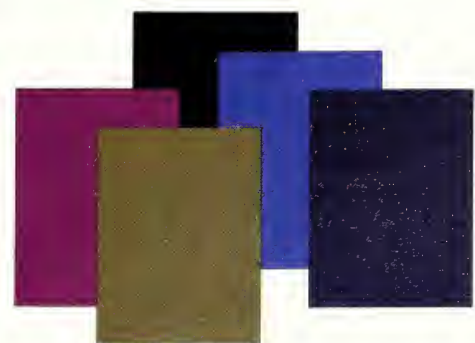
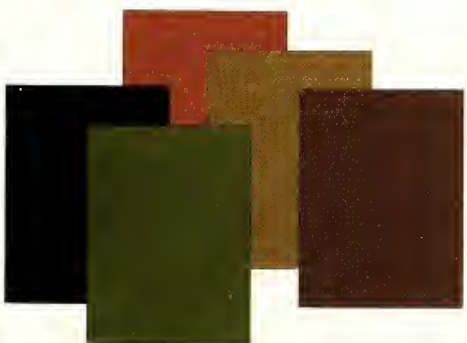


Use Harmony for Variety in Color Plans

The use of more than four colors in a combination introduces greater variety. Any one color in a four-color plan may be replaced by two or more colors whose average color quality is the same as the one that was taken out. The maximum spread between the new colors should not be too great; lightness variations are most workable.

With more than four colors, alternate sets of four colors appear. This adds greater variety to the color plan and indicates how variations on a color plan come into being. It is also the way in which separate color plans can be related one to the other, within a room, or between rooms.

These multiple color plans create most striking mood effects, but they work best in the hands of an expert.



YOUR PERSONAL COLOR PLAN

The development of a personal color plan begins with a study of your skin color, or complexion. All races have the same natural colorants in their skin, but variations in the proportion of various colorants produce wide variations in basic skin colors. You will find, too, that the color of your skin varies greatly in different parts of your body, and textural differences exaggerate this variation. However, by using the charts on pages 14-15 you will be able to determine your dominant skin color. This color then should become the primary reference point in making color decisions. For a rule of thumb: if a color—cosmetic or apparel—makes your skin look fresh and healthy, wear it. If a color makes your skin looks drab and sallow, don't wear it. Using the color relationships demonstrated in the charts, experiment with various combinations until you can tell by looking at a color whether it feels "right for you." No matter how creative or "far out" you become in your use of color, this fundamental principle will still apply.



Cosmetics

Cosmetics can improve the texture of the skin, but more importantly they can enhance or accentuate skin color. For example, experimentation will show you that face powder only a step or two away from your average skin color as shown on the chart can lighten or darken your complexion markedly.

For another example, you can choose a lipstick that will produce a dramatic contrast with your skin color; or you can choose one that is similar in hue to your basic skin color. To achieve the latter more conventional effect, choose a yellowish red lipstick to go with yellowish skin tones; if the skin tone is more pinkish, choose a bluish red lipstick color.

Apparel

In choosing apparel, both your skin color and your hair color are important in determining which color combinations will look best on you.

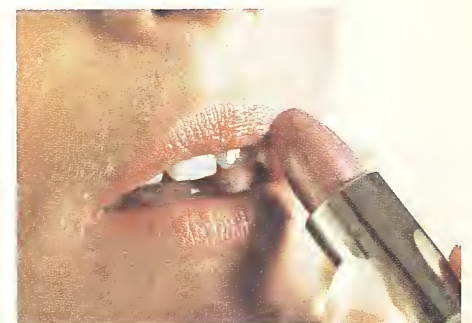
If your skin is light and your hair color is light (either blond or light gray), light or pastel colors with small amounts of stronger contrasting colors will look well on you.

If your skin is light and your hair color is dark (black or brunette), dark or light colors with greater amounts of strongly contrasting color will be preferable.

If your skin is dark and your hair color is dark, the darker and stronger apparel colors with bold contrasts will be most effective.

People today tend to experiment more with color than they did in the past, and often the most startling combinations are pleasing and attractive. But two principles should be remembered: if the colors make the skin look sallow or unhealthy, the overall effect will be unpleasant; and if the colors and contrasts are too strong, they will overwhelm the skin and hair colors and attract attention to the clothes instead of the person.

In general terms, clothing and cosmetics having little contrast to the basic skin color have a relaxed, quiet, modest effect. A moderate degree of contrast accentuates personal coloring but does not destroy this modest effect. Highly contrasting colors, on the other hand, produce a lively, dramatic effect that can be quite exciting if it is not overdone.



YOUR COLOR ENVIRONMENT

After you have worked out your personal color scheme, you can consider the effect of the color environment: in particular, room surfaces. The following suggestions, based on traditional views, can serve either as a guide or a point of departure for the more adventurous.



Ceilings

Since we are accustomed to seeing people lighted from above, as from the sky, ceiling colors should be lighter than others in the room, usually white or near-white. This treatment helps to conserve the light which comes through the windows in the walls. It also works well in the nighttime when artificial illumination is used.

Walls

Whatever the color quality, wall colors for most rooms should range between those of middle lightness and white. To save light, they should be rather closer to white. The light color family on page 8, the lightest group on page 11, and the upper groups on pages 14-15 all have colors which are well suited for use as wall colors.

If, however, the room has abundant light from windows, darker colors may be used for walls. Then extra artificial light is needed, preferably as accent or local lighting at nighttime.

Floors

Floor colors are usually acceptable when they are in the same lightness range or somewhat darker than the wall color. There are certain practical considerations with regard to floors. For example, texture or pattern in the case of rugs, marbling or design pattern in the case of floor tiles, or grain in the case of wood, all tend to minimize or hide wear or other marks of traffic. This is helpful in house-keeping. The lightest or most sensitive floor treatments should be reserved for rooms with the least traffic or where the necessary cleanup attention is available.

COLOR PLANS FOR THE HOME

In the American home the most care in decoration is probably given the living room, not only because that is where the family spends most of its time, but also because that is where guests are entertained.



Living Room

Living rooms should provide a relaxed environment. The color scheme should be based on the natural colors that you do not wish to change; for example, materials such as wood, stone, brick, or tile, that may be used in paneling, fireplace, mantel, and floor. These are the basic colors of the room. A treasured painting, rug, chair, or table may also provide one of the basic colors.

Because you will spend a great deal of time there, you should probably consider choosing living room wall and drape colors without strong light-dark contrasts, without vivid colors or bold patterns. Heavy accents tend to draw attention away from the people in the room, and make the living room a place in which it is difficult to read, sew, or relax.

Drapery colors should contrast slightly to moderately with adjacent wall color, preferably on the light side to minimize contrast with any bright areas visible through the windows.

Upholstery colors should be somewhat darker than wall colors, and can be similar in color quality. More often they can become independent members in the color plan with their own design features or patterns.

A few small areas in the room should have vivid colors, either brilliant, or deep and rich, to accent the color scheme. A painting, a vase containing flowers, a colorful ceramic, may supply the needed accent. A small spotlight or the placement of a lamp can further dramatize the effect of an accent color, making it brighter than its surroundings. Such accents are the spice of room decor.

Bedroom

Bedrooms for adults call for a softer, less dramatic decor. In a cold climate, warm colors such as yellows, reds, and light browns should predominate. In a warm climate, cooler colors such as blues and greens may be more desirable. Sharp contrasts between light and dark colors interfere with relaxation and should be avoided. Even the accents should be either small or not much different from one of the basic colors.

The colors in a woman's bedroom should be chosen to reinforce the hues of the good features in her personal color scheme—hair, eyes, complexion color; the bedroom should have the same, or nearly the same hues as the dominant colors of her leisure wardrobe.

The colors of a man's den or bedroom can be more subdued, with emphasis on earth colors, or mildly contrasting combinations that reflect his preference in clothes and accessories.

The colors of a child's bedroom can be brilliant or vivid, and can use sharper contrasts. The light level should be high to make reading and study easier. For this reason, large areas of dark color should be avoided; however, light blues, greens, or red-to-orange can be used liberally to good effect.

Dining Room/ Dining Area

In general, the dining area can be considered an extension of the living room, with the same or a related color scheme. Furniture, pictures, carpet, table linens, and in some instances china can set the basic color tones. Lighting should be moderate to subdued, and too-dark or too-vivid colors usually should be avoided. Always use colors which enhance the natural color of foods.



Kitchen

Kitchens are for work, and should be planned for concentration rather than relaxation. A high level of general lighting is needed to create an attractive workroom that encourages alertness and sustained attention. The amount of illumination reaching the floor, both day and night, should be considered in choosing the floor color. Don't make the floor too dark. It should be light enough to show spills easily.

The color of the major appliances and cabinets should relate to the floor color. Whatever wall space remains can be in a color to contrast with the floor and cabinets.

Vivid colored pots and pans, towels, utensils and containers can be used for accents.

Bathroom

The color of the fixtures, sink, bathtub, etc., along with the wall tiles provide the starting colors for a bathroom color plan. Traditionally, these fixed features are contrasted to appear light and clean. Wall and floor colors should be somewhat darker to achieve this effect, but always light enough to use the available illumination to promote good seeing. Extra local lighting will also be helpful. Dark colors—browns, deep greens, and black—are available in some modern fixtures, and can be used for dramatic effects.

The wide variety of colors available in towelling now gives considerable freedom in developing color accents.

Recreation Room

The recreation room is sometimes a background for relaxation, sometimes for fun and excitement, but always for informality. Use here the unusual color combinations that were rejected for other rooms, but which still intrigue you. Dramatic, highly contrasting colors are particularly suitable. Lighting should be variable so that you can change the atmosphere of the room at will. If you have used strong contrasting colors, they will be particularly effective when the lights are low. Unlike gently contrasting colors, they will maintain their pattern in dim light.



USE COLOR TO DRAMATIZE OR TO HIDE

The background will determine whether an object stands out . . . or blends in.

Think of the problem of decor in terms of object and background. What objects—like a statuette—should attract attention; and what parts of the setting—like grandpa's worn-out easy chair that he won't part with—should be made to merge with the background?

There are two sure ways to dramatize an object by color choice. Present it as a light color against a background of a dark color, or as a dark color against a light background color.

To hide an object, or make it merge with the background, choose a background color of the same lightness. The central sample is the same in these illustrations. While four colors are shown in each surround group, any one color with the same lightness contrast will work.



COLOR AND ILLUMINATION

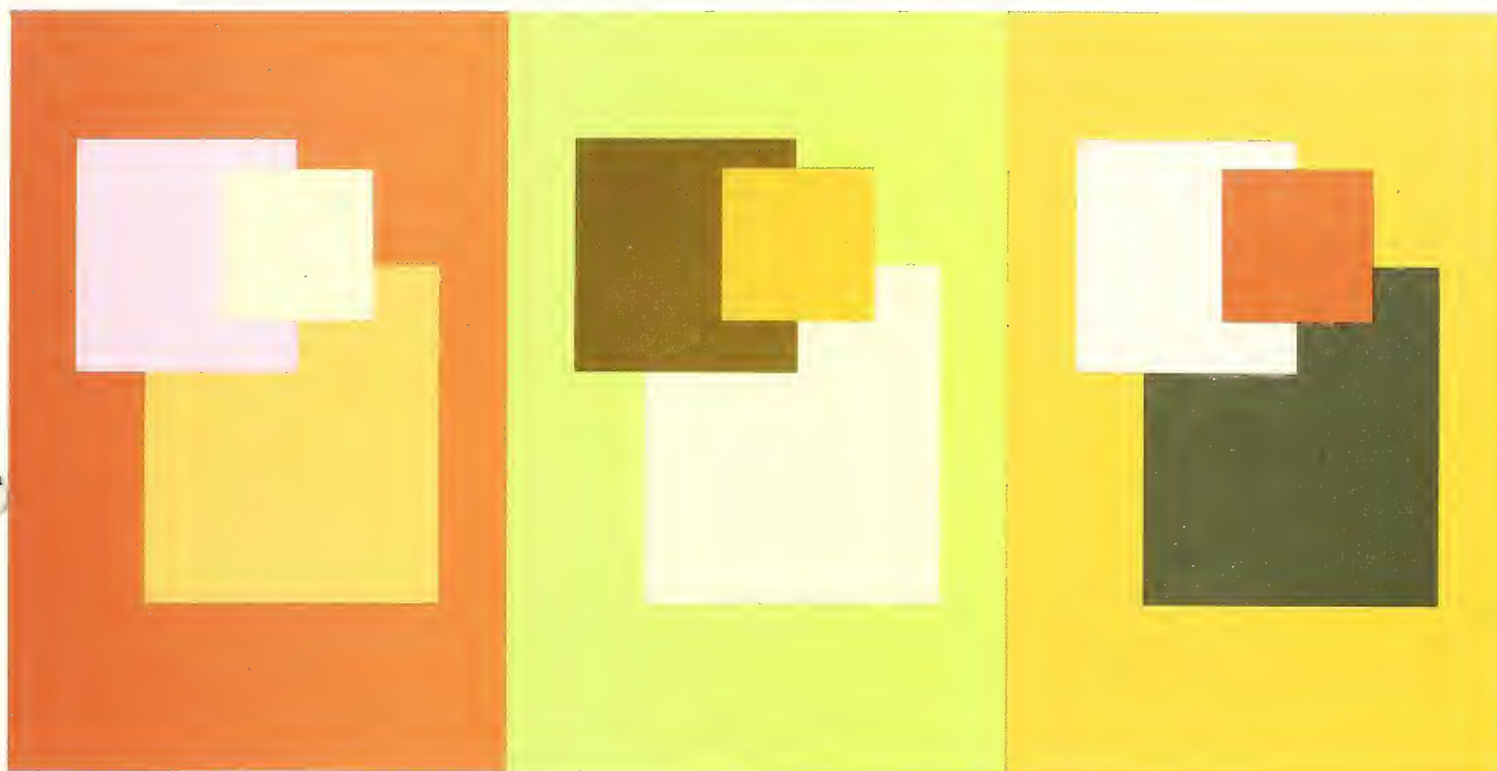
The color of objects is strongly influenced by the illumination. *Always make a final check of colors under the illumination in which they are to be used.* The first check should be made in daylight, near a window or in the sunlight. Here the full potential of the color can be appreciated. If the object is to be used indoors, a second check should be made under the kind of light where the object will be normally used—tungsten bulb or fluorescent. Watch for hue changes which upset the color harmony as you move from daylight to artificial light.

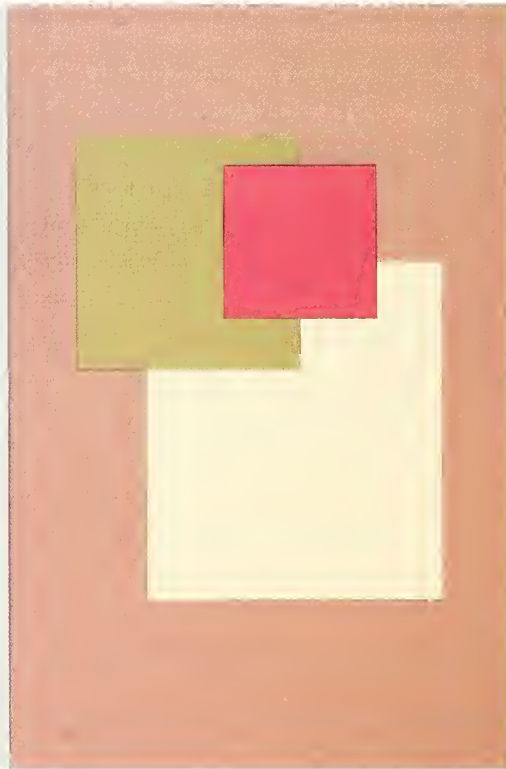
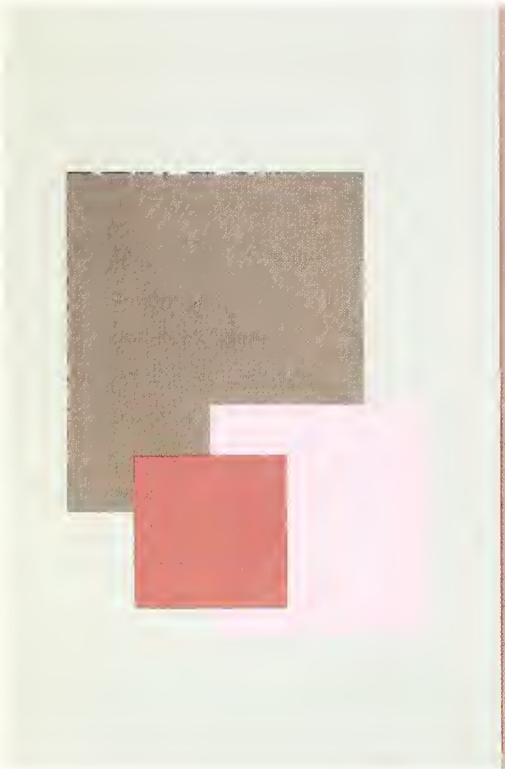
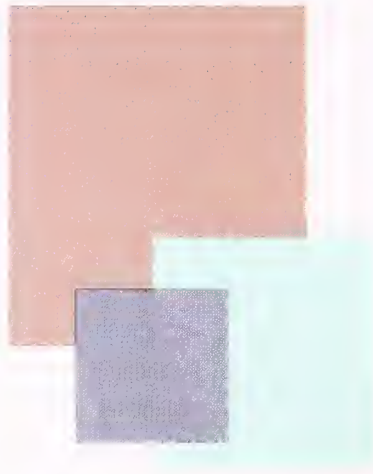
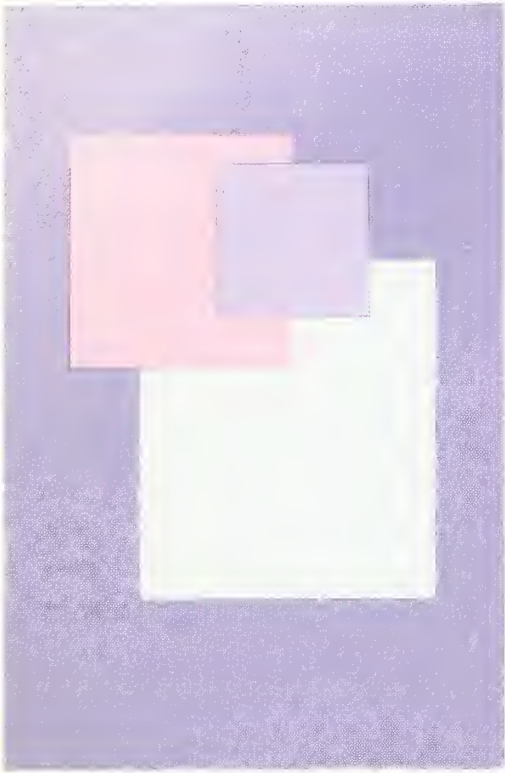
EXPERIMENTING WITH COLOR

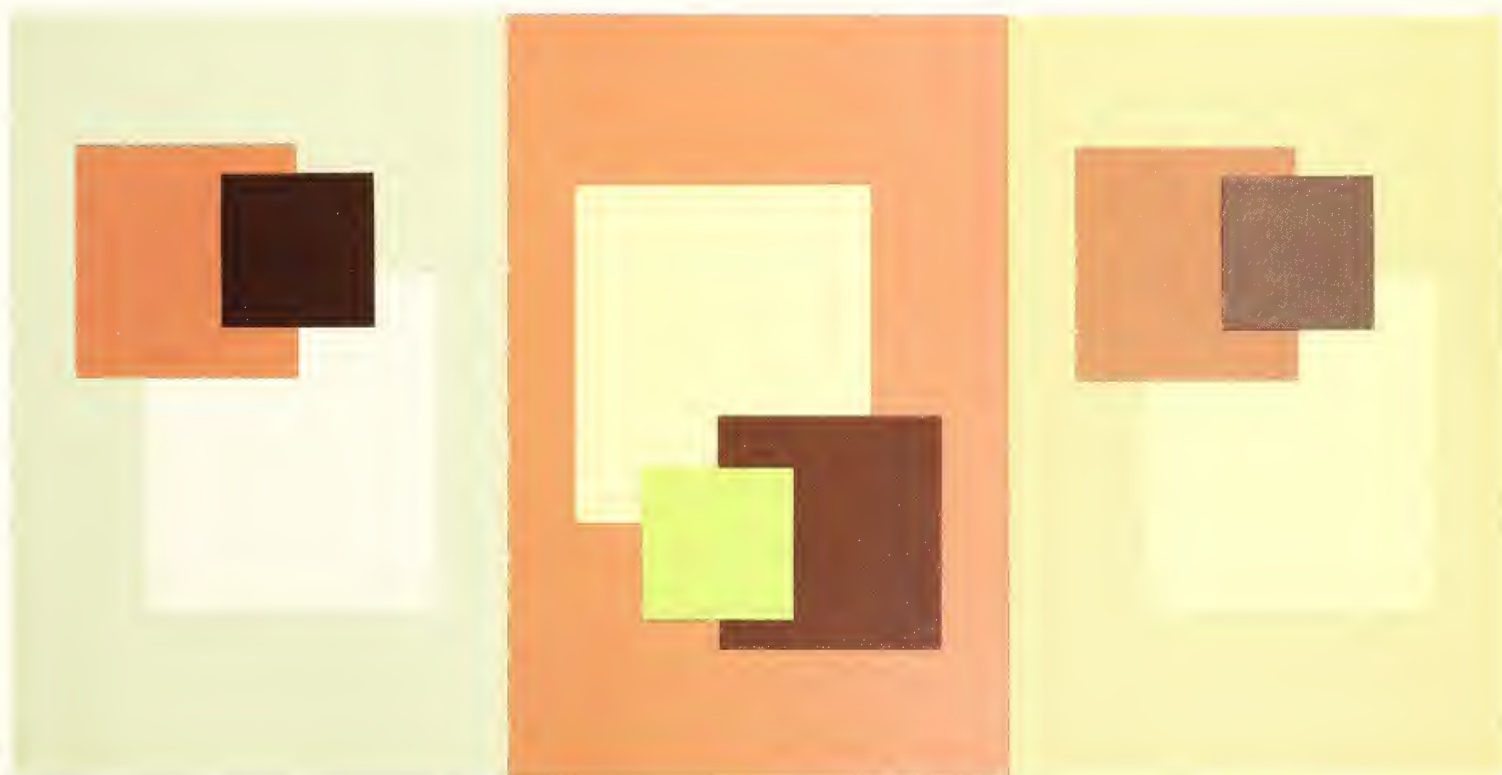
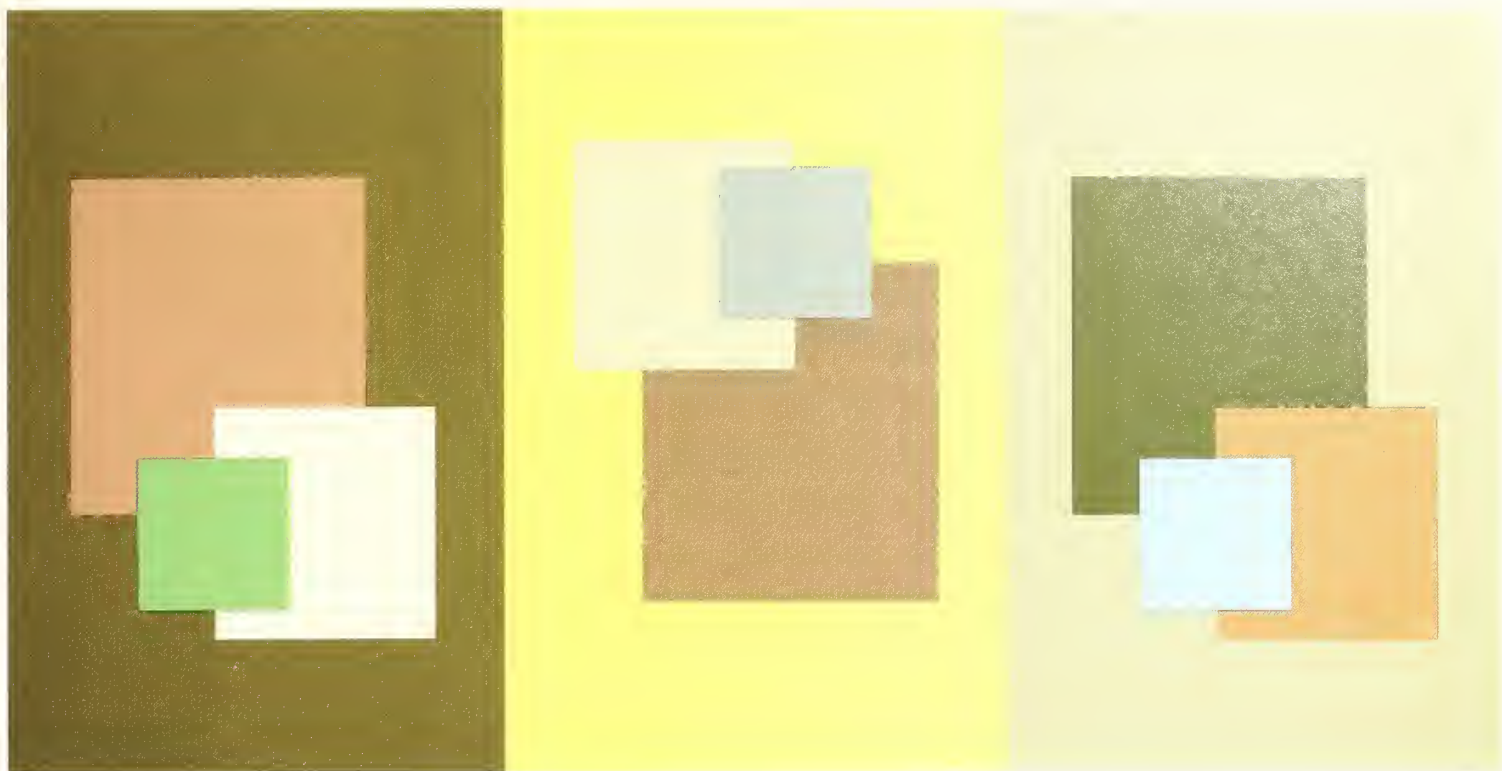
A woodland in spring or fall, or a sunset sky can demonstrate the infinite variety of color combinations that are pleasing and acceptable to the most critical eye. In variety of color, today's marketplace is beginning to rival nature. Fabrics, paints, plastics, pottery, tile—the possibilities are endless.

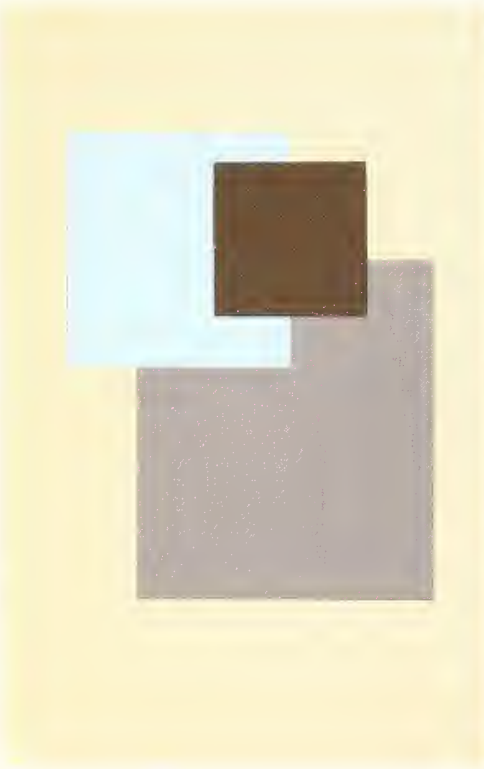
Once you have familiarized yourself with the guidelines to color harmony in this booklet, try your hand at new and unfamiliar combinations that will make your neighbors sit up and take notice. You may find that working with color can be challenging, exhilarating, and fun!

As a start toward your study of new combinations, we present 21 color combinations. They are all abstract color plans, and can apply to kitchens and bathrooms as well as living rooms and bedrooms. They are not intended to be copied as answers; they are intended as examples to stimulate you to find new answers of your own.









A WORD FROM THE DIRECTOR . . .

Because of the importance of color in our daily lives, and to foster a wide understanding and appreciation of the relationships of colors, we are pleased to publish this booklet in the National Bureau of Standards Consumer Information Series. The author of this publication, Dr. Deane B. Judd, was preparing the manuscript when he died. During his career, Dr. Judd gained an international reputation for his many contributions to increased understanding of color. Publication of *Color in Our Daily Lives* is a fitting tribute to him and to his work. We are indebted to Carl E. Foss, retired senior officer of the Munsell Color Company, for assuring the fidelity of the color illustrations, and for assisting in the completion of this booklet. Many others have also given of their time and effort in its preparation, and to them we say thank you.



RICHARD W. ROBERTS, Director
National Bureau of Standards

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