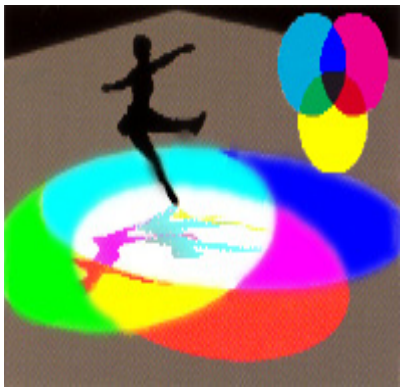


HOW COLOR AFFECTS US

COLOR PSYCHOLOGY

Generally, color, is the effect produced on the eye and its associated nerves by light waves of different wavelength or frequency. Light transmitted from an object to the eye stimulates the different color cones of the retina, thus making possible perception of various colors in the object.

Our personal and cultural associations affect our experience of color. Colors are seen as warm or cool mainly because of long-held (and often universal) associations. Yellow, orange and red are associated with the heat of sun and fire; blue, green and violet with the coolness of leaves, sea and the sky. Warm colors seem closer to the viewer than cool colors, but vivid cool colors can overwhelm light and subtle warm colors. Using warm colors for foreground and cool colors for background enhances the perception of depth.

Although red, yellow and orange are in general considered high-arousal colors and blue, green and most violets are low-arousal hues, the brilliance, darkness and lightness of a color can alter the psychological message. While a light blue-green appears to be tranquil, wet and cool, a brilliant turquoise, often associated with a lush tropical ocean setting, will be more exciting to the eye. The psychological association of a color is often more meaningful than the visual experience.

Colors act upon the body as well as the mind. Red has been shown to stimulate the senses and raise the blood pressure, while blue has the opposite effect and calms the mind.

People will actually gamble more and make riskier bets when seated under a red light as opposed to a blue light. That's why Las Vegas is the city of red neon.

For most people, one of the first decisions of the day concerns color harmony. What am I going to wear? This question is answered not only by choosing a style and fabric appropriate to the season, but by making the right color choices. And it goes on from there. Whether you're designing a new kitchen, wrapping a present or creating a bar chart, the colors you choose greatly affect your final results.

How often have you caught your breath at the sight of a flowerbed in full bloom? Most likely the gardener has arranged the flowers according to their color for extra vibrancy. Have you ever seen a movie in which a coordinated color scheme helps the film create a world unto itself? With a little knowledge of good color relationships, you can make colors work better for you in your business graphics and other applications.

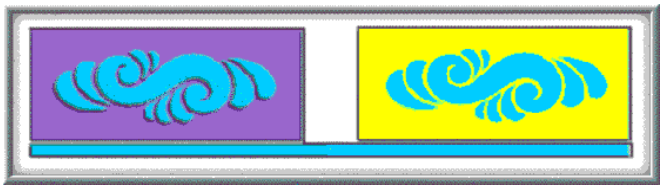
Color is light and light is energy. Scientists have found that actual physiological changes take place in human beings when they are exposed to certain colors. Colors can stimulate, excite, depress, tranquilize, increase appetite and create a feeling of warmth or coolness. This is known as chromo dynamics.

An executive for a paint company received complaints from workers in a blue office that the office was too cold. When the offices were painted a warm peach, the sweaters came off even though the temperature had not changed.

The illusions discussed below will show you that sometimes combinations of colors can deceive the viewer, sometimes in ways that work to your advantage. They can also cause unfortunate effects in your graphics, so be sure to watch out for these little traps.

Sometimes colors affect each other in unexpected ways. For example, most colors, when placed next to their complements, produce vibrating, electric effects. Other colors, in the right combinations, seem quite different from what you'd expect.

The most striking color illusions are those where identical colors, when surrounded by



different backgrounds, appear to be different from each other. In a related effect, different colors can appear to be the same color when surrounded by certain backgrounds.

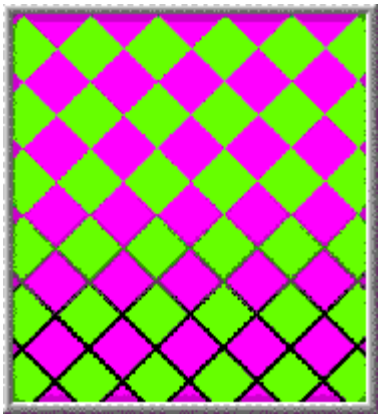
When you look at a colored object, your brain determines its color in the context of the surrounding colors.

In this picture, the two bows are the same color, but because the surrounding areas are strikingly different in contrast, it seems to our eyes that they are different. Keep this effect in mind when creating graphics where color matching is critical. If you attempt to match your corporation's official colors, you may find that even if you achieve an exact match, it may look wrong in context.

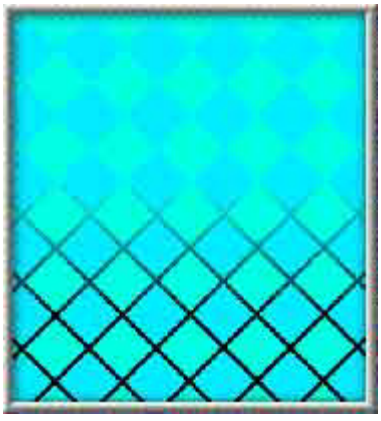
In the same way that one color can appear different in different surroundings, two similar colors may appear to be identical under some conditions. Even though the two symbols are actually slightly different tones, the contrasting backgrounds cause our brains to think that they are the same color. This effect is harder to control, but be aware of it because it can affect your graphics in hidden ways.

The feeling you get when looking at bright complementary colors next to each other is a vibrating or pulsing effect. It seems that the colors are pulling away from each other. It's caused by an effect called color fatiguing. When one color strikes a portion of the retina long enough, the optic nerve begins sending confused signals to the brain. This confusion is intensified by the complementaries.

Mixing brilliant complementary colors gets attention, but it should be used with restraint. The effect is disconcerting and can make your eyes feel like they've been shaken around.



If you want to use complementary colors without causing discomfort, you can outline each of the colors with a thin neutral white,



gray or black line. The outlines separate the two colors, which helps your brain keep them separated.

When two very similar colors touch in an image, both colors appear to wash out and become indistinct. This is because the borders between the colors are difficult to distin-

guish and your brain blurs the colors together.

If you outline each of the colors with a thin neutral white, gray or black line, the colors become easier to distinguish. This is called the stained glass technique and is a way to reduce this blurring of the colors.

What Are Other Ways to Define Color?

Color Models

When you ask children to tell you the names of all the colors, they'll know red, blue, yellow and a few more. A more sophisticated adult will be able to name periwinkle, mauve, fuchsia and maybe another hundred. There are, however, thousands of regularly used colors and millions more that can be distinguished by the human eye. To give a name to each of them would be impossible, so scientists have devised various ways of assigning numeric values to colors. These systems are called color models, and they provide precise methods for naming and reproducing exact colors. Some are based on the optical components of the colors and others are based on how people "feel" colors are related to each other.

RGB (Red, Green, Blue) MODEL

In the RGB system, the red, green and blue dots are assigned brightness values along some scale, for example 0 to 255, where 0 is dark and 255 is bright. By listing the three values for the red, green and blue phosphors, you can specify the exact color that will be

mixed.

Additive colors get lighter when mixed. As each component of light is mixed in, the combination becomes a new color.

Red, green and blue are the three additive primaries. You can mix any color of light with different combinations of the additive primaries. When you mix all three together in balanced amounts, you get white.

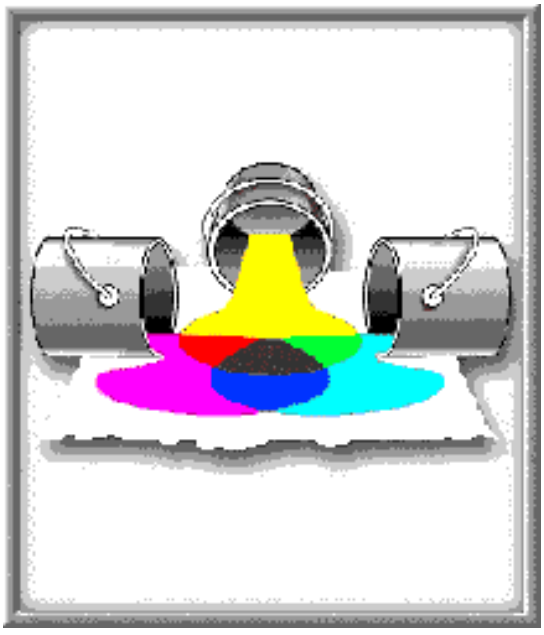
These three primaries are the basis of the additive color model. It's called the RGB model, and it's usually used to create color on your computer display as well as other electronic devices.

By mixing together various amounts of red, green and blue light, you can make almost any color. The RGB color space is a multi-colored cube with different points showing what colors different mixtures of red, green, and blue make. Television screens and computer monitors make their colors by mixing red, green and blue lights. A monitor or television screen mixes a color by illuminating tiny dots of red, green and blue phosphors with an electron gun located at the back of the monitor. By illuminating each of the dots to a different brightness, the monitor creates different colors.

The next several pages have descriptions of the major color models and some experiments to help you visualize how they work.

Because the RGB model is only capable of producing a certain range, or gamut, of colors, there are some colors that cannot be reproduced accurately by a computer monitor. The number of colors visible on a monitor is further reduced by the limitations of the video hardware in the computer, which may display anywhere from just black and white up to 16.7 million colors.

Cyan, magenta and yellow are the three subtractive primaries. Nearly any color can be produced with different combinations of



these three colors. When you mix all three together in equal amounts, you get a near black.

These three primaries are the basis of the subtractive color model. That's why it's called the CMY model. A close relative of the CMY model, called CMYK, is commonly used by printers and some software.

CMYK (Cyan, Magenta, Yellow, Black) Model

Many computer printers and traditional "four-color" printing presses use the CMYK model. In the CMYK model, by using cyan, magenta, yellow and black inks or paints, you can mix nearly any color.

In theory, you can mix any reflective color by mixing a combination of cyan, magenta and yellow. In the real world, however, the inks that printers use are not perfect. This becomes most obvious when you mix all three to make black. The color that results is muddy brown, due to impurities in the inks. That's why printers use black ink to get the best results.

Subtractive colors get darker when mixed. Each of the mixed paints or inks absorbs different components of the light. If the right combination of paints is mixed together, all of the components of light are absorbed and the

result is a near black.

When preparing a color image for printing, the prepress operator makes four separation plates. Each plate is for one of the four colors of ink in the CMYK model. When all four plates are aligned and printed on top of each other, the inks will combine to simulate the proper colors. This method is referred to as "process color" (or "four-color") printing.

HSL (Hue, Saturation, Luminance) Model

The HSL model is very similar to the RGB model. In fact, when they're expressed mathematically, they're identical. The difference lies in how colors are expressed numerically.

The hue determines which basic color it is. Red, green, blue, yellow, orange, etc. are different hues. Saturation and luminance tell more about the variations of these basic colors. Saturation is the vividness (or "purity") of the color, i.e., how much of the color's complement is mixed in. Finally, luminance refers to the "whiteness" of the color. It may also be termed "brightness," "value" or "intensity."

Other models related to the HSL model are the HSB (Hue, Saturation, Brightness) and HSI (Hue, Saturation, Intensity) models. These terms are all similar but not interchangeable.

CIE (Commision Internationale l'eclairage) Model

The CIE model is a more subjective description than the others. In 1931, the Commision Internationale l'Eclairage tested many people and found that the sensitivity of the receptors in the eye caused certain colors to be associated with others. The CIE color space includes all visible colors, whether or not they can be defined in the RGB or CMYK models.

Computer printers and other devices for displaying color have practical limitations that prevent them from making ALL of the visible colors. The colors that they CAN create are collectively called the color gamut. The CIE model is useful in part because a printer's color gamut can be drawn on the CIE color space showing what colors cannot be printed.

PANTONE® Color Reference Systems

The PANTONE MATCHING SYSTEM® is a solid color communication system based on the visual matching of individual, pre-mixed colors. The PANTONE MATCHING SYSTEM is a series of books with thousands of precisely printed colors alongside printers' formulas for mixing those colors.

The PANTONE MATCHING SYSTEM is used by artists and commercial printers to select, specify and match colors very precisely. Many logos are created with specific PANTONE Colors that can be very closely reproduced. By

using PANTONE Colors, designers can be confident that their output will match their expectations.

The original PANTONE MATCHING SYSTEM included 504 colors and has since been expanded to include 1,012 colors along with their printing ink formulations. For four-color (CMYK) printing, the PANTONE Process Color System® specifies more than 3,000 colors and shows the screen percentages for printing.

Recently, as computers have been used more extensively for business and professional graphics, software users have begun to specify their colors with the PANTONE MATCHING SYSTEM and the PANTONE Process Color System. More and more software products have been licensed by Pantone, Inc. to ensure a greater degree of consistency throughout the industry.

Hexachrome®

More recently, Pantone has introduced a revolutionary, patented six-color process printing system called Hexachrome. By providing an enhanced set of Cyan, Magenta, Yellow and Black, plus the addition of PANTONE Hexachrome® Orange and PANTONE Hexachrome Green, the color gamut for reproducing printed photographic images and simulated spot colors has been substantially increased.

One of the inherent short-comings of printing with CMYK (commercially and/or digital printers) is that the resultant color gamut is relatively restricted, resulting in a considerable loss of color from the original artwork. In fact the four-color (CMYK) gamut can only reproduce 50% of the spot/solid PANTONE MATCHING SYSTEM Colors. With Hexachrome, you can now reproduce over 90% of these spot/solid colors, and get a substantially enhanced reproduction of the photographic images.

HowCan We Reproduce Color?

Colorful graphics get the attention and the professional admiration of your viewers, but producing color graphics on the computer used to be so time consuming and expensive that it was only used for professionally published work. Now that the technology has become accessible to even casual users you may find yourself expected to produce colorful handouts, slides or reports on a regular basis.

For some purposes, it is sufficient to be able to display your graphics on screen and show them informally. In a meeting, you may need to print out a few copies as handouts. Occasionally you'll need to publish hundreds or thousands of copies to distribute more widely.

COLOR DISPLAYS

No matter how you intend to show your computer graphics, you'll see them first on a computer monitor. All monitors have limitations that you should know about before you begin.

Most color computer monitors work on the same principle as a television. The screen is composed of phosphor dots that are illuminated from behind. On a color monitor, red, green and blue dots are distributed evenly. These dots are illuminated to different brightness to mix the different colors you see on the screen. If you look very closely, you can see these individual dots.

Most computer display systems are made up of two components: the monitor and a video adapter card that resides in the computer itself. The quality of the display is affected by both the monitor and the video card.

Besides the size of the screen, computer display systems have two primary features that determine the quality of the image: resolution and color depth. Resolution determines the fineness of detail on the screen. The color depth determines how much control you have over the coloring of your graphics.

The video card determines how many colors can be displayed by the monitor. Since the colors are created by mixing different brightness levels for each of the three color dots, a monitor can only mix as many colors as the number of brightness combinations it can make. The number of colors that can be displayed by a video card is called its color depth and is usually specified in bits per pixel.

Color depths in commercial video cards range from black and white (one bit) to over

16 million colors (24 bits). Of course, the human eye can't distinguish that many colors, so these higher-end displays are more powerful than most people need.

When designing on the desktop, your first concern is to assure that you are seeing color on your monitor as accurately as possible. The PANTONE Personal Color Calibrator™ software gives you the ability to set the manufacturer's standard profile for a specific brand and model of monitor, but further lets you set up and save your personal preference for red/green/blue acuity, brightness, contrast and lighting conditions.

In many cases, the number of colors in an image will exceed the capabilities of the device used to display the image. For example, it may be necessary to present a 256-color image on a 16-color display system, or to print a scanned photograph on a low-end dot-matrix printer. In situations such as these, the image is automatically simplified to reduce the number of colors. This process is referred to as color reduction.

As a typical user, you don't need to worry about doing the color reduction. That's usually done for you by the computer system or your software application. Color reduction takes its toll on the quality of your displayed images, however, and you will probably notice these effects in your work.

Color reduction typically uses a technique called dithering. In the same way that the monitor simulates individual colors with its red, green and blue dots, even more colors can be simulated by arranging individual pixels. This technique creates a coarse image which will only look good at a distance.

Over the years, a wide variety of dithering methods (or algorithms) have been developed and implemented for use in image processing. The choice of any particular method depends on the exact nature of the image, the display system and the desired results. Dithering usually creates various distracting patterns (called artifacts or moiré patterns) in the image. Some dither patterns produce better gradations and shading than others, but may require more processing time and memory.

When designing for Web site displays, you can reduce the effects of dithering and provide more consistent color on different monitors if you use the 216 "internet-safe," non-dithering colors. Pantone's ColorWeb® and ColorWeb® Pro software packages help you select and incorporate these colors in the popular Web authoring software programs.

Desktop Printing

If you want to print your graphics on paper but only need a few copies, you need a color printer for your computer. The cost and quality of these printers has been improving dramatically since they were first introduced, leaving you with quite a few choices. The four primary printer technologies for producing color output vary in cost, resolution, color depth and paper requirements. Individual printers also vary in quality, speed, reliability and lifespan.

Pantone has several software packages that can help you manage and control color on the desktop. PANTONE ColorDrive® and PANTONE ColorReady™ are designed to work with popular graphic design programs like QuarkXPress™, Photoshop®, Illustrator® and the like, and also provide more accurate output on a wide range of desktop printers. The company also offers PANTONE OfficeColor Assistant™ which allows the reduction and use of PANTONE MATCHING SYSTEM® Colors in Microsoft® Word, Excel and PowerPoint to assist the business manager in producing more attractive presentations and reports.

Commercial Printing

If you need to produce hundreds or thousands of copies of your work, you will need to take your output to a commercial printer for a large press run. This process is somewhat demanding and expensive, but is the only way to make large numbers of copies.

Commercial printing requires quite a bit of prepress work for each job. Producing camera-ready originals is somewhat technical, so most printing houses have full-time prepress technicians who can do some or all of the work for you, depending on your experience and budget.

When you are deciding what type of printing to do, speed, cost per copy and quality of the output are some of the deciding factors.

The printer's estimator can advise you about the choices available.

There are two different ways color can be applied to paper in color printing: spot color and process color. Spot color is a method of applying a premixed color of ink directly to the page. Process color applies four or more standard ink colors (the basic four are cyan, magenta, yellow and black) in very fine screens so that many thousands of colors are created. Spot color is usually used when a few exact colors are needed. Process color is more useful for printing photographs, paintings and very complex colored images.

In some cases, both spot color and process color can be used on the same document. For example, a company brochure may include color photos (process color) and a corporate logo (spot color). Spot color applies a premixed ink to the page. This color is usually identified by a color system such as the PANTONE MATCHING SYSTEM. Spot color is useful for documents that require only a few colors, such as newsletters, brochures and stationery. Spot color is also used to match specific colors very closely.

The cost of printing color documents is related to the number of ink colors used. As process color requires four or more inks, spot color can be cheaper if you use fewer than four colors. Spot color also has the advantage of printing a wider range of clean, bright colors.

Look around you for an example of spot color printing. If a color seems smooth and even no matter how closely you look, it's probably printed with spot color.

Process color is a method used to create thousands of colors using four or more standard inks. The colors used in four-color process are the three subtractive primaries (cyan, magenta and yellow) plus black.

The original image is separated into its cyan, yellow, magenta and black components. A film is made for each separation and then a plate is produced from the film. The paper is run through the four stations of a four-color press to accept layers of ink from each plate. When all four colors are printed together, the illusion of continuous color is complete.

More recently Pantone has patented a unique six-color process printing technology called Hexachrome®. By incorporating an enhanced set of cyan, magenta, yellow and black and adding PANTONE Hexachrome® Orange and PANTONE Hexachrome Green, the reproduction of photographic imagery can be substantially enriched. Additionally, nearby all the solid PANTONE MATCHING SYSTEM Colors can be accurately simulated, thus eliminating the need to supplement the image reproduction with several spot colors, scanning, designing, separating, proofing and printing.

Take a look around you for a full-color newspaper, book or magazine. If you look very closely at a color photograph, you can make out the halftone dots of the four inks.

If you are printing in process color, your image will require a plate for each of the cyan, magenta, yellow and black inks. As each color of ink used is laid down on the paper individually, a different plate must be created for each ink. Spot colors each require their own plate as well.

Separations can be created in quite a few different ways. You may be asked to provide a full color printout to be optically separated. Your image will either be scanned or run through a separator, which separates the image using filters. On the other hand, you may be asked to provide a disk containing the graphics file. An imagesetter, which is essentially a very high-resolution printer, will create the separations directly from the graphics file.

Halftoning is the most common of the many ways printers create different shades of color from just one ink. A finely etched screen is used when making each plate. This screen changes the darker and lighter areas of the original into areas of larger and smaller dots. When printed, the larger dots will appear darker than the smaller dots, due to greater ink coverage. When multiple colors of ink are printed together, the different apparent shades will combine to simulate far more colors than are actually used.

Halftoning is done with a very fine screen when printing on glossy paper and for higher quality documents. Coarser screens are used for rough paper such as newsprint. Newspapers use coarse screens, so it's fairly easy to make out the individual dots in newspaper

photographs. The fineness of halftone screens is determined by the number of lines of halftone dots per inch. This is called the "lines per inch" or the LPI.

Lithography means "stone-writing." Invented in 1799 by Aloys Senefelder in Germany, this process relies on the fact that water and grease repel each other. A lithograph stone is prepared by drawing the image to be printed on polished limestone with a greasy crayon. In commercial offset lithography, the lithography stone is replaced by thin metal plate that wraps around a printing cylinder.

The imaging areas on the plate are water repellent and accept ink, while the non-imaging areas accept water and reject ink. The ink is offset from the metal plate onto a rubber blanket and then onto the paper, preventing excess wear of the plate. Offset printing is well-suited for color printing, because a typical press can handle six colors with a single pass, including four process and two spot colors, or six-color Hexachrome.

Why WYS IsNot WYG

A common acronym in computer graphics is WYSIWYG. It stands for "What you see is what you get." Unfortunately, a common problem in reproducing color graphics is that what you see on the screen is not what you get when you print. Several effects come together to cause this problem:

1. Monitors and output devices have limitations. Each device has a range of colors it can reproduce, called its color gamut. These vary with the type and model. The printer type, ink and paper quality and the printer's condition also affect the results.

2. Equipment can easily become miscalibrated and require very expensive, specialized accessories to keep them standardized to a predictable performance.

3. Printers that dither can only create a limited number of colors. If you attempt to print a color which does not fall within its abilities, it will produce the nearest match. The printer's resolution is important to its dithering ability, so higher resolution printers usually print higher quality color.

Color management systems are available to help solve these problems if precise color matching is important to you.

Psychology of Color

Do different colors affect your mood?

Like death and taxes, there is no escaping color. It is ubiquitous. Yet what does it all mean? Why are people more relaxed in green rooms? Why do weightlifters do their best in blue gyms?

Colors often have different meanings in various cultures. And even in Western societies, the meanings of various colors have changed over the years. But today in the U.S., researchers have generally found the following to be accurate.

What Colors Mean

We live in a colorful World. In many countries, colors represent various holidays; they are also used to express feelings and enliven language. Find your favorite color and see what it means around the world.

Red

The most emotionally intense color, red stimulates a faster heartbeat and breathing. It is also the color of love. Red clothing gets noticed and makes the wearer appear heavier. Since it is an extreme color, red clothing might not help people in negotiations or confrontations. Red cars are popular targets for thieves. In decorating, red is usually used as an accent. Decorators say that red furniture should be perfect since it will attract attention. It is often associated with credibility, power, cleanliness, focus, medical, professional, judicial, tranquility, peace, harmony, confidence, trust, appetite suppression.

1. For the ancient Romans, a red flag was a signal for battle.

2. Because of its visibility, stop signs, stoplights, brake lights, and fire equipment are all painted red.

3. The ancient Egyptians considered themselves a red race and painted their bod-

RED:

ies with red dye for emphasis.

4. In Russia, red means beautiful. The Bolsheviks used a red flag as their symbol when they overthrew the tsar in 1917. That is how red became the color of communism.

5. In India, red is the symbol for a soldier.

6. In South Africa, red is the color of mourning.

7. It's considered good luck to tie a red bow on a new car.

8. In China, red is the color of good luck and is used as a holiday and wedding color. Chinese babies are given their names at a red-egg ceremony.

9. Superstitious people think red frightens the devil.

10. A "red-letter day" is one of special importance and good fortune.

11. In Greece, eggs are dyed red for good luck at Easter time.

12. To "paint the town red" is to celebrate.

13. Red is the color most commonly found in national flags.

14. In the English War of the Roses, red was the color of the House of Lancaster, which defeated the House of York, symbolized by the color white.

15. The "Redshirts" were the soldiers of the Italian leader Garibaldi, who unified modern Italy in the nineteenth century.

16. To "see red" is to be angry.

17. A "red herring" is a distraction, something that takes attention away from the real issue.

18. A "red eye" is an overnight airplane flight.

19. If a business is "in the red," it is losing money.

Suggested Website Uses: Food, clothing, fashion, cosmetics, real estate, entertainment, health care, emergency services, hospitality, marketing, PR, sport.

Pink

The most romantic color, pink, is more tranquilizing. Sports teams sometimes paint the locker rooms used by opposing teams bright pink so their opponents will lose energy. Romance, creative, unusual, dainty, nostalgia, feminine.

Suggested Website Uses: Florists, Travel, Dating, Crafts, Women's Retail, magazines/e-zines

Orange

Trusting, fruitful, creative, dynamic, energetic, youthful, expressive, childlike, innocent, enthusiastic, vibrant, warm, enthused, health.

Suggested Website Uses: Childcare, food, entertainment, education, recruitment, sport

Brown

Solid, reliable brown is the color of earth and is abundant in nature. Light brown implies genuineness while dark brown is similar to wood or leather. Brown can also be sad and wistful. Men are more apt to say brown is one of their favorite colors. Nurturing, historical, retrospective, safe, financial, traditional, conservative, reliable, Conservative, simplistic, stable, boring, comfort, outdoors, warm homey.

Suggested Website Uses: Mining, construction, veterinary, financial, real estate.

Green

Currently the most popular decorating color, green symbolizes nature. It is the easiest color on the eye and can improve vision. It is a calming, refreshing color. People waiting to appear on TV sit in "green rooms" to relax. Hospitals often use green because it relaxes patients. Brides in the Middle Ages wore green to symbolize fertility. Dark green is masculine, conservative, and implies wealth. However, seamstresses often refuse to use green thread on the eve of a fashion show for fear it will bring bad luck. Nurturing, natural, organic, calm, youthful, instructional, education, adventurous, ecological.

Notable uses of green

1. Only one national flag is a solid color: the green flag of Libya.

2. Ancient Egyptians colored the floors of their temples green.

3. In ancient Greece, green symbolized victory.

4. In the highlands of Scotland, people wore green as a mark of honor.

5. Green is the national color of Ireland.

6. A "greenback" is slang for a U.S. dollar bill.

7. Green means "go." When "all systems are green," it means everything is in order.

8. The green room of a concert hall or theater is where performers relax before going onstage.

9. The "green-eyed monster" is jealousy.

10. A greenhorn is a newcomer or unsophisticated person.

11. Green is youthful.

12. Being "green around the gills" is looking pale and sickly.

13. "Green with envy" means full of envy or jealousy.

14. A person with a "green thumb" is good at making plants grow.

15. A green, or common, is a town park.

16. Green is a healing color, the color of nature.

Suggested Website Uses: Medical, scientific, governmental, recruitment, HR, tourism, eco-business

Blue

The color of the sky and the ocean, blue is one of the most popular colors. It causes the opposite reaction as red. Peaceful, tranquil blue causes the body to produce calming chemicals, so it is often used in bedrooms. Blue can also be cold and depressing. Fashion consultants recommend wearing blue to job interviews because it symbolizes loyalty. People are more productive in blue rooms. Studies show weightlifters are able to handle heavier weights in blue gyms. Credible, powerful, calming, clean, focused, medical, professional, judicial, tranquility, peace, harmony, confidence, trust, suppress appetite.

Notable uses of blue

1. In ancient Rome, public servants wore blue. Today, police and other public servants wear blue.

2. In China, blue is for little girls.

3. In Iran, blue is the color of mourning.

4. Blue was used as protection against witches, who supposedly dislike the color.

5. If you are "true blue," you are loyal and faithful.

6. Blue stands for love, which is why a bride carries or wears something blue on her wedding day.

7. A room painted blue is said to be relaxing.

8. "Feeling blue" is feeling sad. "Blue devils" are feelings of depression.

9. Something "out of the blue" is from an unknown source at an unexpected time.

10. A bluebook is a list of socially prominent people.

11. The first prize gets a blue ribbon.

12. A blue blood is a person of noble descent. This is probably from the blue veins of the fair-complexioned aristocrats who first used this term.

13. "Into the blue" means into the unknown.

14. A "bluenose" is a strict, puritanical person.

15. A "bluestocking" used to be a scholarly or highly knowledgeable woman.

16. The pharaohs of ancient Egypt wore blue for protection against evil.

17. The "blues" is a style of music derived from southern African-American secular songs. It influenced the development of rock, R&B, and country music.

18. "Blue laws" are used to enforce moral standards.

19. A blue ribbon panel is a group of especially qualified people.

Suggested Website Uses: Medical, dental, scientific, utility services, governmental, health care, IT, technological, recruitment, trades, podiatry, law.

Purple, Violet

The color of royalty, purple connotes luxury, wealth, and sophistication. It is also feminine and romantic. However, because it is rare in nature, purple can appear artificial. Spiritual, sensual, metaphysical, mysterious, magical, religious, evocative, senses, healing.

Notable uses of purple and violet

1. The Egyptian queen Cleopatra loved purple. To obtain one ounce of Tyrian purple dye, she had her servants soak 20,000 Pur-

pura snails for 10 days.

2. In Thailand, purple is worn by a widow mourning her husband's death.

3. A "purple heart" is a U.S. military decoration for soldiers wounded or killed in battle.

4. Purple is a royal color.

5. Purple robes are an emblem of authority and rank.

6. "Purple speech" is profane talk.

7. "Purple prose" is writing that is full of exaggerated literary effects and ornamentation.

8. Leonardo da Vinci believed that the power of meditation increases 10 times when done in a purple light, as in the purple light of stained glass.

9. Purple in a child's room is said to help develop the imagination according to color theory.

10. Richard Wagner composed his operas in a room with shades of violet, his color of inspiration.

Suggested Website Uses: Body, mind and soul, podiatry, crystals, astrology, tarot, aromatherapy, massage, yoga.

Yellow

Cheerful sunny yellow is an attention getter. While it is considered an optimistic color, people lose their tempers more often in yellow rooms, and babies will cry more. It is the most difficult color for the eye to take in, so it can be overpowering if overused. Yellow enhances concentration, hence its use for legal pads. It also speeds metabolism. Often interpreted as a way to indicate youth, energy, dynamics, encouragmentg, design, ideas, bright, invention, sunshine, happiness, optimism, imagination, cheery, unsettling.

Notable uses of yellow

1. In Egypt and Burma, yellow signifies mourning.

2. In Spain, executioners once wore yellow.

3. In India, yellow is the symbol for a merchant or farmer.

4. In tenth-century France, the doors of traitors and criminals were painted yellow.

5. Hindus in India wear yellow to celebrate the festival of spring.

6. If someone is said to have a "yellow streak," that person is considered a coward.

7. In Japan during the War of Dynasty in 1357, each warrior wore a yellow chrysanthemum as a pledge of courage.

8. A yellow ribbon is a sign of support for soldiers at the front.

9. Yellow is a symbol of jealousy and deceit.

10. In the Middle Ages, actors portraying the dead in a play wore yellow.

11. To holistic healers, yellow is the color of peace.

12. Yellow has good visibility and is often used as a color of warning. It is also a symbol for quarantine, an area marked off because of danger.

13. "Yellow journalism" refers to irresponsible and alarmist reporting.

Suggested Website Uses: Signs, childcare, food, entertainment, e-commerce, new technology.

White

Brides wear white to symbolize innocence and purity. White reflects light and is considered a summer color. White is popular in decorating and in fashion because it is light, neutral, and goes with everything. However, white shows dirt and is therefore more difficult to keep clean than other colors. Doctors and nurses wear white to imply sterility. Often associated with cleanliness, purity, simplicity, innocence, readability, honest, bareness, clinical, clean, medicinal, clear, pure, spacious, simple**.**

Notable uses of white

1. A white flag is the universal symbol for truce.

2. White means mourning in China and Japan.

3. Angels are usually depicted wearing white robes.

4. The ancient Greeks wore white to bed to ensure pleasant dreams.

5. The Egyptian pharaohs wore white crowns.

6. The ancient Persians believed all gods wore white.

7. A "white elephant" is a rare, pale el-

ephant considered sacred to the people of India, Thailand, Burma, and Sri Lanka; in this country, it is either a possession that costs more than it is worth to keep or an item that the owner doesn't want but can't get rid of.

8. It's considered good luck to be married in a white garment.

9. White heat is a state of intense enthusiasm, anger, devotion, or passion.

10. To whitewash is to gloss over defects or make something seem presentable that isn't.

11. A "white knight" is a rescuer.

12. A white list contains favored items (as opposed to a blacklist).

13. A "whiteout" occurs when there is zero visibility during a blizzard.

14. A "white sale" is a sale of sheets, towels, and other bed and bath items.

15. A "whited sepulcher" is a person who is evil inside but appears good on the outside, a hypocrite.

16. "White lightning" is slang for moonshine, a homebrewed alcohol.

17. A white room is a clean room as well as a temperature-controlled, dust-free room for precision instruments.

18. White water is the foamy, frothy water in rapids and waterfalls.

Black

Black is the color of authority and power. It is popular in fashion because it makes people appear thinner. It is also stylish and timeless. Black also implies submission. Priests wear black to signify submission to God. Some fashion experts say a woman wearing black implies submission to men. Black outfits can also be overpowering, or make the wearer seem aloof or evil. Villains, such as Dracula, often wear black. Strong, powerful, credible, precise, definite, professional.

Notable uses of black

1. The ancient Egyptians and Romans used black for mourning, as do most Europeans and Americans today.

2. The "Blackshirts" were the security troops in Hitler's German army, also known as the S.S.

3. Black often stands for secrecy.

4. Black humor is morbid or unhealthy and gloomy humor.

5. In China, black is for little boys.

6. A "blackhearted" person is evil.

7. If a business is "in the black," it is making money.

8. A "blacklist" is a list of persons or organizations to be boycotted or punished.

9. Black is associated with sophistication and elegance. A "black tie" event is formal.

10. A black belt in karate identifies an expert.

11. A black flag in a car race is the signal for a driver to go to the pits.

12. A blackguard is a scoundrel.

13. The ancient Egyptians believed that black cats had divine powers.

14. Black lung is a coal miner's disease caused by the frequent inhaling of coal dust.

15. Blackmail is getting things by threat.

16. Black market is illegal trade in goods or money.

17. A black sheep is an outcast.

18. "Blackwash" (as opposed to "whitewash") is to uncover or bring out in the light.

19. A blackout is a period of darkness from the loss of electricity, for protection against nighttime air raids, or, in the theater, to separate scenes in a play.

20. When you "black out," you temporarily lose consciousness.

Suggested Website Uses: Corporate, financial, fashion, construction, manufacturing, cosmetics, mining, oil, marketing, trades.

Colors of the Flag

In the U.S. flag, white stands for purity and innocence. Red represents valor and hardiness, while blue signifies justice, perseverance, and vigilance. The stars represent the heavens and all the good that people strive for, while the stripes emulate the sun's rays.

Food for Thought

While blue is one of the most popular colors it is one of the least appetizing. Blue food is rare in nature. Food researchers say that when humans searched for food, they learned

to avoid toxic or spoiled objects, which were often blue, black, or purple. When food dyed blue is served to study subjects, they lose appetite.

Green, brown, and red are the most popular food colors. Red is often used in restaurant decorating schemes because it is an appetite stimulant.

Color is symbolism.

We say someone who is jealous is "green with envy". Someone who is sad is said to be "blue". When we are angry, we "see red". Colors affect us psychologically. They can stimulate our appetite or suppress it. They can make us happy, excited, angry or sad. We all have the same reaction to color. It affects our emotions thereby leaving a lasting effect on us when we buy or purchase products.

You created your web design for usability. If you are selling "tarot cards" then consider using mystical, spiritual colors like **purples, blues, golds**. Put your user in an inspirational mood upon their first click to your site. The color emotion invoked in your user will be the best stickiness (keeping your user at your website) for your site. If they feel inspired through your color then they will stay here and read your text or see the crystal ball animated gif sparkling its *"Welcome to my Psychic Homepage"* sign.

Your web page colors should similarly allow your visitor to read the content, or view photos without strain. So remember your users when choosing your color scheme since they will be the ones who will click their credit card there.

Tips to stop scaring your visitors and your money straight to the competitor:

- Make sure you have avoided bright yellow backgrounds.
- Make your content stand out from the page by using darker colors on light backgrounds. Plus these pages are easier for users to print and read later.
- Make sure you have allowed busy backgrounds and photos to stand alone. You should not write text across either. It won't get read.
- Choose larger fonts for text on dark or black backgrounds. Staring at a computer provides enough strain on the eyes. Don't lose a visitor by adding to it.

A Special Note About Using Colors on the Web

Although modern computers are capable of displaying millions of colors on the screen, Web design is limited to only 216 colors. The reason for this is that Mac computers and PC's both use completely different color palettes. However, they have 216 colors that are common to both. These 216 colors are considered "Web safe". Using the 216 Web safe colors means that your Web site colors will look fairly consistent on different computers (Mac or PC), different operating systems (Windows or Mac), as well as different browsers (Internet Explorer and Netscape Navigator, to name two).

Colors speak their own language and evoke emotions instantly. Use colors sparingly, yet intelligently, in the creation of your website. Once you understand how to intertwine colors into your site, your sales should increase.