Hair Color (8 hours)

TABLE OF CONTENTS

	page
Lesson 1: Color Theory (2 hours)	1
Lesson 2: Color Applications (2 hours)	14
Lesson 3: Sanitation and Sterilization (2 hours)	30
Lesson 4: OSHA Regulations (2 hours)	43
References and Resources	61

Lesson 1: <u>Color Theory</u> (2 hours)
Outline

- The Level System
- The Law of Color
- The Color Wheel
- Hair Color Product Formulations
- Oxidative Hair Coloring Products
- Non-oxidative Hair Coloring Products
- Permanent Hair Coloring Products
- Temporary Hair Coloring Products
- Patch Testing
- Developers

Learning objectives:
After completing this lesson you will be able to:

- define hair porosity and describe the porosity test
- define hair texture and the various types
- identify pigmentation and the various types
- describe the meaning of tonal values
- identify the level system, the level system chart and it's values
- describe properties of the color wheel
- define primary, secondary, tertiary and complementary colors
- identify the 2 classifications of oxidative hair coloring products
- identify the 2 classifications of non-oxidative hair coloring products
- describe temporary and semi-permanent products
- identify key facts of permanent hair coloring products
- identify key facts of demi-permanent hair coloring products
- describe the importance and purpose of a patch test
- identify the purpose of developers

Introduction

The purpose of this study topic is to review the principles and practices of Color Theory and to review key facts about hair coloring product formulations and practices of product applications..

Precautions: To ensure the safety and accuracy of product use for coloring services that you perform, please consult the product company and their published instructions and information regarding their formulations. Never take for granted that you already know how to prepare or process hair coloring products that you are unfamiliar with. To do so could cause injury to yourself or your client. Also, keep in mind that companies sometimes change their formulations. This may or may not effect the way you mix and apply their product. However, to be abreast of any changes, you should establish the practice of reading all packaging enclosures, labels and instructions as part of your customary preparations prior to performing color services.

Color Theory

Porosity

One of the first things to consider when planning a color service is the degree of porosity of the hair. **Porosity is defined as the hair's ability to absorb moisture.** It is not to be confused with hair texture.
These are two different terms that refer to two different aspects of the hair. The amount of porosity is to be analyzed and placed into one of three categories. Cosmetic Art Science terms these categories as “degrees of porosity”. The degrees of porosity are: low, average and high. There are clinical techniques to determine hair porosity. During testing you will be using your sense of touch to categorize the client's hair.

You will test the four main areas of the head:

1. the front hairline
2. the temple
3. the crown
4. the nape

Create a small strand of just a few hairs and hold it perpendicular to the head. With the opposite hand, grasp the hair strand using your thumb and forefinger then slide your fingers slowly and gently from the ends to the scalp. You are feeling for the amount of roughness of the hair cuticle.
The smoother the hair feels the lower the degree of porosity that is present. **The rougher the hair feels the higher degree of porosity that is present.**

Low Porosity: The hair feels smooth when tested.
Hair that has a low degree of porosity has a lessened ability to absorb moisture and is considered resistant to chemicals. **Hair that has a low degree of porosity might take longer to process.**

Average Porosity: The hair feels slightly rough.
Hair that has an average degree of porosity is considered normal. It is for this degree of porosity that chemical formulations of hair color are designed for when the label refers to processing instructions for “normal” hair.

High Porosity: The hair feels very rough.
Hair that has a high degree of porosity is considered overly porous. **Color processing takes less time and the hair may lose it's color quicker due to the open cuticle.**

Texture

Texture is the term used in Cosmetic Art Science to describe the diametric measurement of a hair strand. There are three categories of measurement when analyzing the diameter of a hair strand: large, medium and small. The corresponding terms for these textures are termed as:**coarse, medium and fine. Analyzing the clients' hair texture is important when planning a color service for the following reasons.**

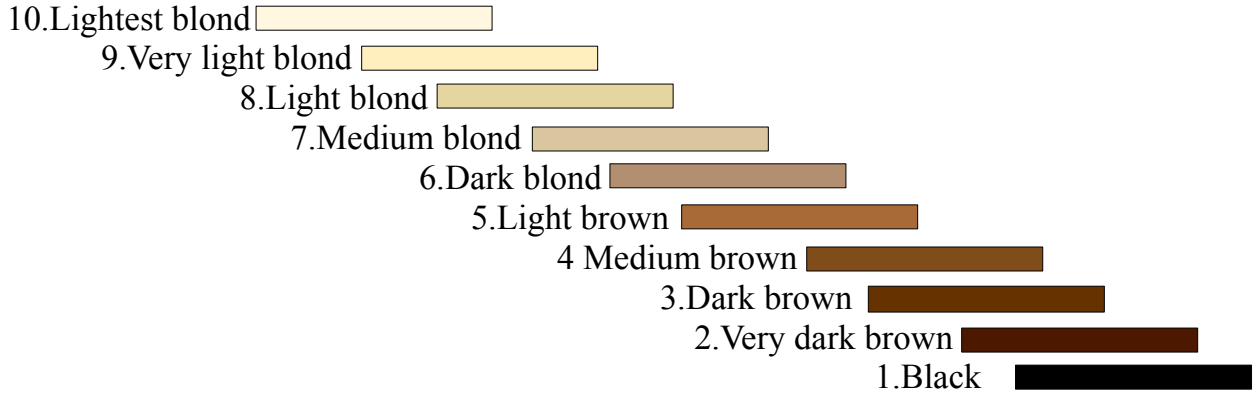
Melanin
Melanin (pigment) is created and dispersed in varying amounts in each of the texture categories. **Melanin is most compact in fine hair and less compact in coarse hair.** Where there is more compact melanin, the hair can take on more depth and become darker during a color service. Where there is less compact melanin, the hair can take longer to process. It is important to consider this theory during the planning phase of a color service.

Eumelanin
Eumelanin is the pigment that is found in natural hair that gives it tonal hues of blacks and browns.

Pheomelanin
Pheomelanin is the pigment that is found in natural hair that gives it tonal hues of blonds and reds.

The Level System
Cosmetic Art Science has developed a way to identify and categorize the lightness or darkness of the color of hair into units of measurement. It is called the level system and is used to identify and put into perspective color density. It is also described as: the amount, concentration or saturation of color.

The Level System
Figure 1 (levels of color)



There are ten units of measurement in the level system. Level 1 is black and level ten is lightest blond. Each unit of measurement, from level one, gets lighter and lighter until it reaches the lightest color labeled as #10 - lightest blond.
The units are as follows: 10.Lightest blond; 9.Very light blond; 8.Light blond; 7.Medium blond; 6.Dark blond; 5.Light brown; 4 Medium brown; 3.Dark brown; 2.Very dark brown; 1.Black

It is important to note that the names given to the 10 degrees of color level can vary among product companies who manufacture color level swatches. The focus here is to identify degrees of color saturation and depth between levels, the degrees of lightness to darkness.

The building block for any color service is the initial analysis of the clients' level of color. Without mastering this step it is impossible to achieve accuracy in predicting the end results. Many hair product manufacturers include color level system swatches to make the job easier. After familiarizing yourself with the color levels you will become less dependent upon using the level system swatches. However, it is the best practice to continue using this tool throughout your entire career as a colorist in order not to inadvertently stray from accuracy of good analysis.

While learning the level system, it is imperative to use swatches otherwise you may develop an altered sense of level recognition. It is similar to a professional singer. Unless the performer practices with an accurately tuned instrument, such as a professionally tuned piano, he is at risk of altering his ability to recognize true and perfect intonation.
This is a good example to compare with the professional colorist. Unless you train your eye with an “in tune” instrument, such as color level swatches, you are at risk of failing to develop a strong eye for color level recognition.

None the less it is superb practice to continue using color level swatches as customary practice for each color service no matter how trained your eye. All tools are to be implemented as appropriate to the service being rendered to maintain a level of excellence.

How To Use Color Level Swatches
The primary use of the color level swatch is during the initial client consultation. Later in this study we will discuss at greater length all components of a professional consultation, however for now we will focus on hair color analysis.

First determine the client's natural color level by sectioning the hair into about a half inch square at the crown of the head. Hold it perpendicular to the scalp so that light passes through it. Select the natural color level hair swatch that you think best matches and place it against the strand to compare.

You can check the hair at the scalp and throughout the strand by sliding the swatch up and down the strand to see if all parts of the hair strand are within the same level. Once you have determined color level, you will apply other color laws and factors that help in determining the services to be performed.

To develop the plan of service we also need to consider hues.

Color Hues
Also called tones, color hues are what hair color is all about when it comes to chemistry. Tones or hues are colors that we will be studying using the Color Wheel. Without a complete understanding of color hues it is impossible to achieve natural results. The average patron coming into the salon to get their hair colored requires natural colored hair. Very few people, in comparison to the mass majority, want extreme or vivid colors such as green, purple or fire engine red. Most people want an attractive natural hair color. So the goal of creating natural color is a primary basic of color analysis.

We take into consideration the tone of the natural hair and the tones that we will add with hair coloring products in order to achieve the desired results. All tones play a part of the hair coloring equation. Becoming an expert color analyst is only achievable by learning the color wheel, it's tones and the theory behind it.

The Law of Color

Color is described as the property of an object that determines what the eye is perceiving based on how it reflects light. Hair can reflect components that we perceive as brown or blond but contain the colors of red, green, blue and other shades. In certain combinations of these colors, we perceive very dark brown hair. Other combinations of colors we perceive very light blond hair. There are about as many shades and tones as your imagination will allow when it comes to color results. By adding blues and violets we can make the hair appear more ashy, by adding yellows and reds we make the hair appear more warm. Successful hair coloring is primarily the ability to properly add and remove colors. We have many choices regarding hair color. We can add to the natural hair color. We can remove natural hair color, and we can also add and remove at the same time. We can lighten the level and change the tone simultaneously. It is really an amazing art for the well-rounded colorist. Becoming an expert colorist is one of the most important things you can do in the filed of Cosmetology. It is one of the most important services offered in the salon today. It is the best way to establish consistent repeat customers who due to the nature of hair growth must book their touch-ups regularly. This in turn, make for strong client-colorist relationships which results in dependable income.

Tonal Value

Here again the need for analyzing comes into play. Once you have established the level of hair color using the level system, now you must determine the different hues that the client's hair contains. Determining levels and tones are the first steps in building the plan for the coloring process.We take the natural color level, the natural color tones, and what the client tells you that she wants the end results to be, and work the equation.

The Basics of Hair Coloring Products and The Law of Color

Hair coloring products use primary and secondary colors. All hair coloring products have a base color which is the dominant color contained in the product. Base colors are determined by the product manufacturer with natural results in mind. The colorist will use the laws of color to determine how to use these products. Through the ages several prolific scientists have discovered, theorized and defined what is now considered the laws of color.

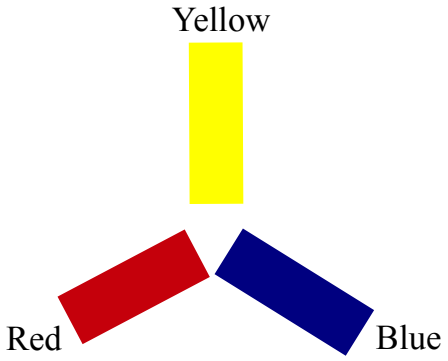
Whether in reference to an artist's paint on a canvass or a rainbow in the sky, there are certain laws we find in color creation that apply.

For example: always, without fail, **when you combine equal amounts of yellow and blue you will always get green. Equal amounts of red and yellow always make orange**. These examples are part of the laws of color and color creation.

Science has found that using the shape of a wheel and placing primary and secondary colors around the wheel in a certain order, they can best dictate color law into a meaningful conclusion.

Let's build a color wheel!
We will start with the primary colors. **Primary colors consist of yellow, red and blue**.

Primary Colors
Figure 2



Primary colors are pure colors and can not be formed from combining any other colors. However you can use these colors to make other colors. In fact, **all colors are created from the three primary colors**.

Cosmetic Art Science uses the terms “cool” and “warm”. **If a color has predominately blue tones it is considered to be cool.** If a color has predominately red or yellow tones it is considered to be warm.

This terminology helps in understanding color concepts when mixing hair coloring products. To create a warmer shade, you can add more red. To create a cooler shade, you can add more blue.
That would be a very basic rule of thumb however additional color concepts need to be mastered in order to have a complete understanding of hair coloring technology.
For instance, blue is considered the strongest of all the primary colors and the only cool one. In hair coloring concepts, it is good to know that the color blue can provide depth and darken any color. As for red, it is considered a medium strength primary color.

In hair coloring concepts, it is good to know that adding red to blue based colors makes them lighten. **Red added to yellow based colors makes them darken.**

Yellow is considered the weakest strength of the primary colors. When added to other colors it changes that color to a brighter and lighter appearance.

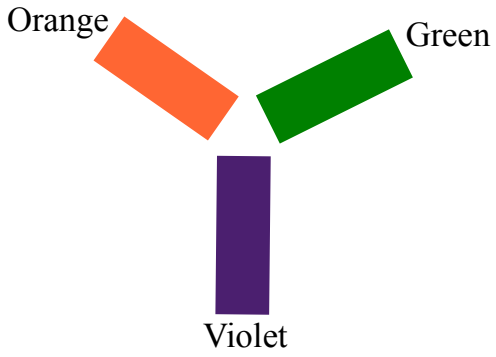
When the three primary colors (red, blue and yellow) are mixed together in equal parts, the following colors are created: black, gray and white, according to the level used.

When two primary colors are combined, a secondary color is created.

There are only three secondary colors. They are green, orange and violet.

Secondary Colors

Figure 3



Combing equal amounts of blue and yellow make green.
Combing equal amounts of red and yellow make orange.
Combing equal amounts of blue and red make violet.

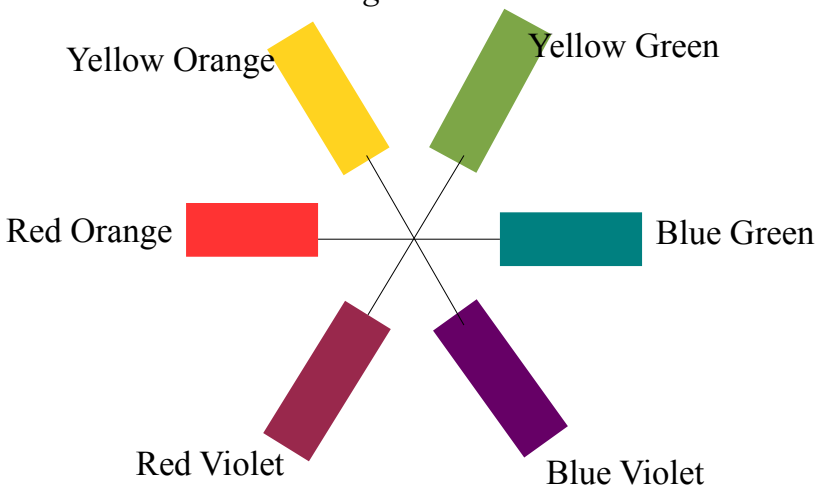
By looking at the color wheel we can see that colors are in a specific order.

Tertiary colors are the colors created when combining equal amounts of a primary color and it's neighboring secondary color on the color wheel.

Tertiary colors are: blue-green, blue-violet, red-violet, red-orange, yellow-orange and yellow-green.

Tertiary Colors

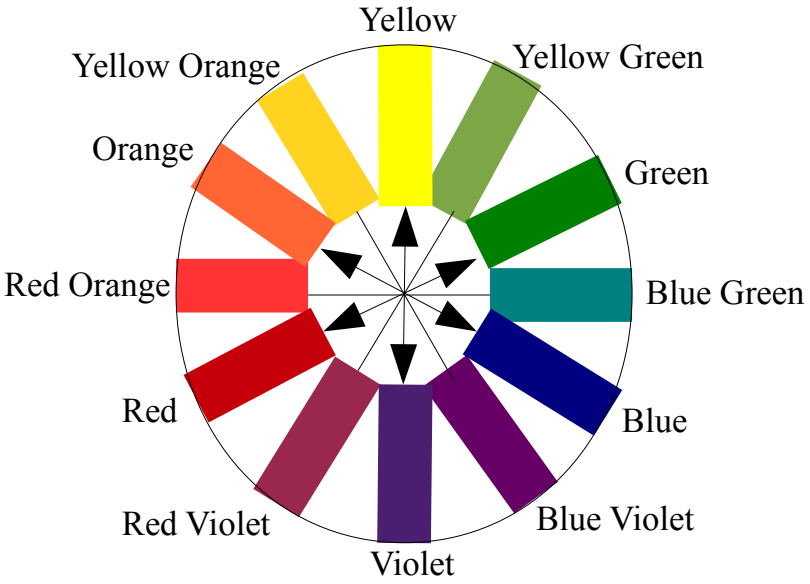
Figure 4



Complementary Colors
Complementary is the term used for primary and secondary colors that are directly opposite each other on the color wheel. Each color's complementary color neutralizes it's tone. For example: to neutralize an over abundance of yellow in the hair, use equal level of it's complementary color violet.

Complementary Colors

Figure 5



Hair Coloring Product Formulation

Cosmetic Art Science defines hair coloring products into two main categories:
Oxidative and Non-oxidative

Oxidative hair coloring products are classified into two groups:
1.Permanent
2.Demi-permanent

Non-oxidative hair coloring products are classified into two groups:
1.Temporary
2.Semi-permanent

Oxidation is when the chemical substances combine with oxygen.
Oxidative hair coloring products are designed using oxidation as a necessary action to achieve hair coloring.

Oxidative hair coloring products consist of a solution that contains dye *intermediates* which when mixed with a developer creates a dye as the chemicals react within the hair shaft.

Also contained in oxidative hair coloring products, are *preformed* dyes. They are included in hair coloring products in predetermined amounts according to the shade that is intended for the formulation.
Hair coloring products also contain soaps, detergents and conditioning agents.
The coloring product is designed to mix with the developer (hydrogen peroxide) right before application to the hair.
The terms hydrogen peroxide and developer are interchangeable and refer to the same additive.
The applied mixture causes the hair to swell, and the dye intermediates and preformed dyes penetrate the hair shaft and then have a chemical reaction. This reaction is what forms the final dye composition that will stain the hair.

Product Overview

Permanent hair coloring products are designed to lift existing color and deposit product color.
Permanent hair coloring products are used in coloring services for the following purposes.
1.To completely change one's hair color
2.To enhance one's natural hair color by brightening it, or darkening it
3.**To cover gray**

Demi-permanent hair coloring products are designed to only deposit product color.
They contain coal-tar dyes that adhere to the hair shaft. Demi-permanent hair coloring products are not designed to lighten natural hair.

Demi-permanent hair coloring products are used in coloring services for the following purposes.
1.To refresh previously colored hair that has faded
2.To enhance one's natural hair color
3.To deemphasize gray hair so it blends in better to the overall color of the person's hair
4.To use as a toner to chemically pre-lightened hair
5.To use as a filler for a color correction procedure

Temporary hair coloring products are used in coloring services for the following purposes.
1.To change the hair color temporarily
2.To neutralize an undesired tone

Semi-permanent hair coloring products are used in coloring services for the following purposes.
1.**Can be used as a toner** to pre-lightened hair
2.Can be used when a short-term change is desired, as it generally only lasts from four to six weeks

Semi-permanent hair coloring products are single products. They are not mixed with developers or peroxide. **Demi-permanent hair coloring products are mixed with developers.**

PATCH TEST REQUIRED

Permanent Hair Coloring Products

Permanent hair coloring products are always mixed with a developer.
Using a higher volume of developer creates more lightening results and using a lower volume of developer creates less lightening results.
Simultaneously with the lightening action, color is deposited.

Permanent hair coloring products are very versatile in that they can be used to match, darken, lighten or cover gray.

Aniline derivatives are used in permanent hair coloring products.
Aniline, phenylamine or aminobenzene is an organic compound; $C_6H_5NH_2$.
Any hair coloring product containing aniline dyes requires a patch test 24 to 48 hours before application.

The types of aniline are:
1.aniline oil for blue (pure aniline);
2.aniline oil for red (a mixture of equal parts - aniline and ortho- and para-toluidines);
3.aniline oil for safranine (aniline and ortho-toluidine) Safranin (basic red 2) is a biological stain that colors cell nuclei red.

Colors develop when the aniline derivatives combine with hydrogen peroxide.
The dye is deposited into the cortex of the hair. This is the oxidation process.
Oxidation is defined as: to undergo or cause to undergo a chemical reaction with oxygen.

Historians agree that aniline: was first isolated from the distillation of indigo (a plant-based blue dye such as; used in blue jeans) in 1826. This was done by Otto Unverdorben, who named it crystalline.
However in 1834 Friedlieb Runge isolated aniline using coal tar, which also in turn produced a blue color when lime chloride was added to it.

Aniline from coal tar is still widely used today in hair coloring products.

Over time aniline became greatly used commercially in many products such as plastics and dyes. There is now a giant synthetic dye industry based on aniline dyes.
Hair product manufacturers get their aniline derivatives from these dye companies to use in their hair coloring product lines.

Permanent hair coloring products are the best choice for dying gray hair.

Permanent hair coloring products create a permanent change in the hair by lightening the existing natural color by removing color pigments. This is the primary reason that they are called permanent colors – because of permanent removal of natural pigment.

PATCH TEST REQUIRED

Demi-Permanent Hair Coloring Products

Demi-permanent hair coloring products are oxidative. They require a developer. They only deposit color and do not lighten. They are less alkaline than permanent hair coloring products and require a lower volume developer.

Many demi-permanent hair coloring products do not use hydrogen peroxide as the oxidizing agent like with permanent hair coloring products. They do contain the same dyes as permanent hair coloring products therefore requiring a patch test.

Demi-permanent hair coloring products do not have the ability to decolorize hair.

These no-lift deposit-only hair coloring products are great for:
1.a client's first color service
2.blending gray
3.to refresh faded permanent color on the mid-area and ends
4.restoring natural hair color
5.correcting off-tones

On natural hair, they can deepen or change the color.

Demi-permanent color is a great choice for refreshing the hair shaft area and ends when performing a new growth hair color service.
It keeps hair coloring build-up to a minimum using this technique.

NO PATCH TEST REQUIRED

Temporary Hair Coloring Products

Temporary hair coloring products are non-oxidative. They do not require a developer.
Temporary hair coloring products only coat the hair and are easily shampooed away. No chemical change in the hair occurs.
There are various types of temporary hair coloring products in the marketplace and many new products arriving frequently.

Some of the existing types of temporary hair coloring products are:
1.Spray on
2.Shampoo
3.Liquid / rinse
4.Mousse
5.Gel
6.Mascara / wand

Spray on temporary color products wash out easily with one shampoo. It is used for many looks from subtle to dramatic – from full coverage to streaks and designs. For dramatic designs, stencils can be used. It is fun for the client and the colorist can offer it as a specialty service during the Holidays. Stencils can be purchased or custom made from existing patterns.

Shampoo temporary color products are simply used like normal shampoo. Follow label instructions for best results. The color molecules coat the hair and you can blow-dry and style as usual. The use of color shampoos is a very popular way to neutralize unwanted brassiness or yellow tones.

Liquid temporary color products, also known as rinses, are applied to freshly shampooed hair. Follow the directions on the label for recommended use for best results. Generally the rinse is applied after shampooing. Many stylists wrap the hair in a towel to blot all excess water. The hair should not be dripping wet for proper application. The hair must be able to be coated and it can not do so if over-saturated with water. For full coverage, apply beginning at the hairline and comb through to the ends, applying more rinse as needed. Style as desired.

Mousse temporary color products should be used following label directions for best results. Most are designed for either wet or dry hair – full coverage or strategically placed.
Gel temporary color products can be applied the same as customary setting gels. Usually they can be applied to wet or dry hair however read the label for best results.

Mascara temporary coloring products and those that are applied with wands are great when you want perfect placement and control. They are usually designed for use on dry hair. Of course many eye-lash mascaras are available in many colors, but so are designer hair mascaras. It's a great way to temporarily color new growth around the hairline. Creative highlights can be perfectly placed using illuminating colors on styled dry hair.

PATCH TEST REQUIRED

Semi-Permanent Hair Coloring Products
Semi-permanent hair coloring products are designed to fade over time. They often last about four to six weeks depending on how many times the hair is shampooed.
Semi-permanent hair coloring products are not mixed with peroxide. They do not lift or lighten the natural hair color and only deposit color.
Semi-permanent hair coloring products require a patch test.

PATCH TESTS ARE NOT INTENDED FOR DIAGNOSIS OR TREATMENT OF HEALTH CONDITIONS

Patch Test
A patch test is also known as a *predisposition* test.
The term predisposition is defined as: the state of being predisposed or susceptible to something, especially to a disease or health problem. In this case it refers to a client being predisposed to being allergic or sensitive to the aniline dye in the hair coloring product.

Therefore to determine whether a client will have a negative reaction, **we must perform the patch test 24 to 48 hours before an aniline hair coloring service.**

To perform a patch test:
1.Choose a testing area either on the inside of the elbow or behind the ear.
2.Wash a small area with a gentle soap, rinse and dry.
3.Mix a small amount of the hair coloring product (use the shade and brand that you intend on using for the service) in the same ratio as a customary application.
4.Using a cotton swab, apply color mixture to the cleaned area.
5.Do not rinse or remove for 24 to 48 hours.
6.After 24 to 48 hours look at the patch test area to determine if there are any signs of inflammation, rash or welts.
7.Record the results on the client's information card.

Developer / Hydrogen Peroxide

The developer is what must be mixed with oxidative hair coloring products in order to create the chemical reaction needed to form and deposit color. Hydrogen peroxide also plays a part in the determination of the amount of lightening natural hair.

Hydrogen peroxide is the oxidizing agent that "develops" the hair coloring product thus called the developer. When hydrogen peroxide is mixed with oxidative hair coloring products it creates oxygen gas that in turn forms the chemical action that creates color molecules that change the color of hair.

Hydrogen peroxide is available in different concentrations called volumes. The volume indicated on the labeling refers to the concentration. Concentration is also referred to as strength. The stronger the formulation the greater amount of lightening that can be achieved. Developer is somewhat customizable but there are specific limitations, scientifically speaking. Most hair coloring product companies design their permanent hair coloring products to use 20 volume developer for normal application. 20 volume peroxide is always used for achieving gray coverage.
Other volumes are used for various color applications.
10 volume is used for deposit-only applications.
30 volume is used when additional lightening is desired.
40 volume is used when maximum lightening is desired.

Lesson 1 Summary
In this lesson we have thoroughly discussed the most important aspects of The Level System, and The Law of Color. We have reviewed very important facts about the proper use of The Color Wheel. We have thoroughly reviewed Hair Color Product Formulations.and can now clearly explain Oxidative Hair Coloring Products and Non-oxidative Hair Coloring Products. We have identified Permanent Hair Coloring Products, Temporary Hair Coloring Products, and the importance of Patch Testing. And lastly we can clearly define the use of Developers. We now turn our attention to Lesson 2: Color Applications.

Lesson 2: Color Applications (2 hours)
Outline

- Hair Lightening and Decolorization
- Preliminary Strand Test
- Permanent Hair Coloring Products
- Single-process Hair Coloring Application
- Single-process Retouch
- Semi-permanent Hair Coloring Application
- Trouble-shooting
- Baliage Free-hand Application

Learning objectives:
After completing this lesson you will be able to:

- describe the process of decolorization, the decolorization chart and it's values
- define contributing pigment
- describe the contributing pigment chart and it's values
- define the purpose and application procedures for a preliminary strand test
- identify the purpose and application procedures for single-process hair coloring
- describe the purpose and list application procedures of a single-process retouch
- describe the purpose and application procedures of semi-permanent hair coloring
- describe baliage free-hand hair coloring
- define the purpose and procedures for temporary hair coloring applications

Introduction
The purpose of this study topic is to review the principles and practices of Color Theory and to review key facts about hair coloring product formulations.

Hair Lightener / Bleach

Hair lighteners, also known as bleach, work by decolorizing the hair. Bleaching products are designed to use with hydrogen peroxide as the developer. The oxidation process is required to achieve decolorization. When this action happens within the cortex of the hair shaft, it displaces and eliminates the melanin pigment thus decolorizing the hair.
You can control the amount of decolorization by choosing the volume of developer and adjusting the processing time the product is left on the hair.
Hair lighteners are designed to lift the hair to lighter levels than what permanent hair coloring products can achieve.

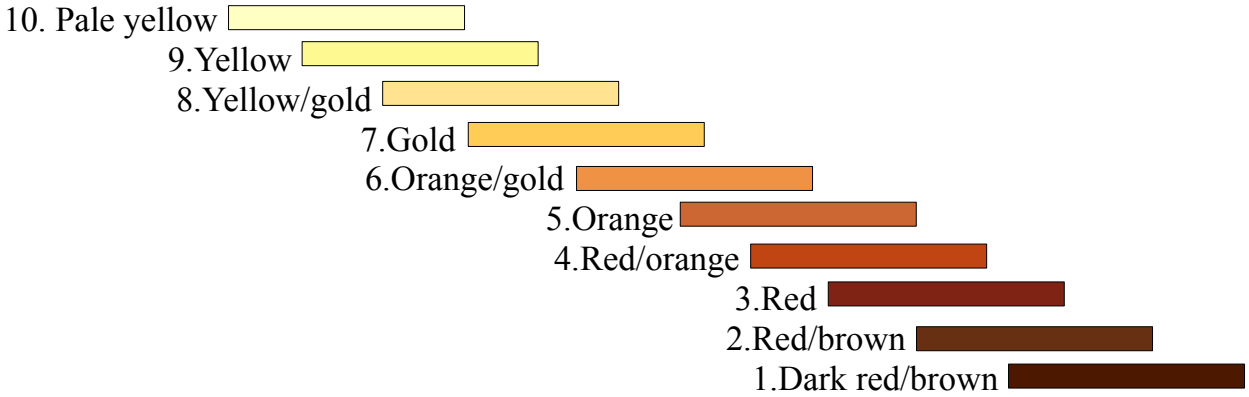
Bleaching is a very versatile tool and is used for various purposes.
Lighteners can be:

- used to lighten natural hair
- used to lighten colored hair
- used to lighten isolated parts of the hair
- used alone to achieve a color
- used as the first step to achieve a level and follow with a toner

Decolorization
The decolorization process begins immediately upon the application of a prepared lightening product.
The colorist predetermines the level of color that she wants to *remain* in the hair.
There is an invaluable tool for calculating decolorization.
It is called the 10 degrees of decolorization.

Degrees of Decolorization

Figure 6 (decolorizing process)



The 10 degrees of decolorization chart is a representation Cosmetic Art Science uses to measure the amount of pigment remaining in the hair throughout the progression of stages of the bleaching process.

In order to show all possible degrees of decolorization for human hair, the decolorization chart represents that the first degree of lightening for black hair is dark red-brown, and so forth. Hair will of course begin at different levels, but none the less will go through the remaining stages as the decolorization process progresses.

Predetermining the final degree of decolorization needed to achieve the desired results of a color service is a key part of pre-planning. Ending the decolorization process at the predetermined degree is crucial.

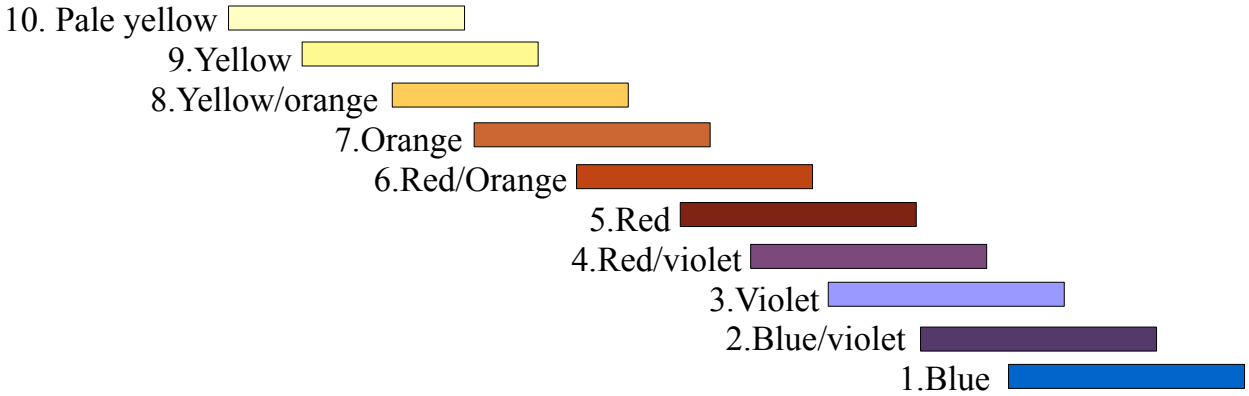
The amount of existing pigment in natural hair, the strength of the lightener and the amount of processing time all impact the lightening process. Also the temperature of the client and the ambient temperature of the room can also play a part in how fast the hair processes.

Oftentimes it has been determined that the warmer a client and room the faster the decolorization process will be.

The natural pigment left in the hair is referred to as contributing pigment or undertones.
Cosmetic Art Science has determined the amount of pigments left in the hair for each stage.

Contributing Pigment

Figure 7 (undertones)



It is the undertone and level of the remaining contributing pigment that determines how to tone the lightened hair. It is rather rare to leave bleached hair non-toned. It usually has an unnatural and unappealing appearance. Therefore toners are more often used than not when using lighteners.

The more pigment that you can leave in the hair and the less time you leave the product on the hair the healthier and stronger the hair will be at the completion of the color service.
That is why the colorist tries to never go lighter than what is needed during the bleaching process.
Also, the colorist should maintain conscious observation of how fast the client's hair is processing.

Sometimes passing through the lower degrees of decolorization may seem to take longer than the higher degrees. Some colorists have observed that after the hair passes through red-orange stage – degrees 4, it tends to progress more rapidly through the remaining degrees.

Severe damage can occur if the hair is processed beyond the pale yellow stage. Toners can not be accepted into hair that has been bleached beyond the pale yellow stage. Bleach is therefore not designed to bring the hair into a white blond level. Only those who are poorly trained in hair coloring will attempt this irreversible error.

However, toners can easily create the white blond look without over lightening the hair. Instead of removing all pigment, you need only to neutralize the yellow to give a white blond appearance.

Any professional hair coloring product can be used as a toner other than temporary hair coloring. That would include: permanent, semi-permanent, or demi-permanent hair coloring products.

Preliminary Strand Test

Because of the many possible scenarios involving ones hair, such as environmental elements, chemicals, porosity, texture, level of natural color and damage, the only true way to be sure how the color service will turn out is to do a preliminary test strand.

By performing the preliminary strand test, you are never at risk of applying color to an entire head that has had a chemical service, that might not be readily observable, such as an over-the-counter lead-based hair color. If that hair coloring product has been used, then it could prohibit certain salon hair coloring applications.
It could be disastrous if a person was too embarrassed to tell you that he had used an over-the-counter product "for men" and you failed to do a preliminary strand test before performing a color service.

Many of the "for men" products are attractive to men because they color the hair gradually, and they can do it themselves, however the end result is often unnatural and even worse, it can give the hair a metallic appearance with off-color hues such as green. Overlapping that color with a salon application could create an undesired results, therefore a strand test is imperative for a good outcome.

The preliminary strand test is performed before the full color service is given.
You will be performing all hair coloring steps as you would for the complete color service but only using the amount of products needed for the test area; 1/2 inch by 1/2 inch strand. You will record: the formulation used, the processing time and the results of the strand test.

Preliminary Strand Test Procedures
Implements

✔ Color swatches and color charts
✔ Client record card and pencil
✔ Full-coverage water-proof patron cape
✔ Towels
✔ Comb
✔ Color gloves for stylist (keep several pairs ready for use)
✔ Plastic hair clips
✔ Frosting foils or pre-cut plastic wrap
✔ Hair coloring product
✔ Developer and measuring spoon
✔ Mixing bowl (plastic or glass) and color applicator brush
✔ Spray bottle filled with warm water
✔ Shampoo
✔ Timer

Procedures

- Consult with your client to confirm that nothing has changed since the initial consultation and that she still wants the same service as decided upon in the initial consultation.
- Confirm that there have been no changes in the condition of her hair and scalp.
- Confirm that the patch test is indeed negative
- Confirm the hair coloring application plan and the formulation remains the same as the patch test formulation
- Record this information onto her record card
- Drape the client as appropriate for a wet service
- **Select the hair strand from the back of the head at the lower crown area and part off 1/2 inch by 1/2 inch section**
- Clip the surrounding hair out of the way
- Place selected pre-sized coloring foil or pre-cut plastic wrap underneath the hair strand and secure the foil to the head with plastic clips

Picture 1: Preliminary Strand Test

- **Mix hair coloring products in the same ratio as for a full service application**. If the hair coloring product calls for equal parts [*color: developer]*, for example; 2 ounces of hair coloring product to 2 ounces of hydrogen peroxide; then keep your test mixture in that same ratio. For example: one tablespoon to one tablespoon. Estimate the amount needed for complete coverage of the hair strand.
- Apply the hair coloring product mixture to the strand and begin timing.
- Every 5 minutes, check how the color is developing
- Upon full development, make a notation on the client's record card of how long you left the color on the hair
- Hold a clean towel placed underneath hair strand and remove the plastic or foil sheet. **Using your spray bottle** of water, rinse the strand
- Add a small amount of shampoo to the test strand and shampoo.

Picture 2: Using your spray bottle of water, rinse the strand.

- Mist to rinse.
- Towel dry and confirm that it is in fact a good results that would work for the full service.
- If there are any adjustments needed such as adding time, reducing time, changing the shade of the formulation, or application method.
- Make notes onto the record card.

Upon the successful completion of the preliminary strand test you would be ready to complete the full color service.

Let's now review selected **Permanent Hair Coloring Product Applications.**

Single-process Hair Coloring

When the client wants a single color all over, it is achieved by what is called the single-process application. As indicated, the hair will be processed using one application of hair coloring product.If the client's hair has never been colored, the first coloring procedure is called a virgin application. The basic virgin application procedures are as follows:

Implements

✔ Color swatches and color charts
✔ Client record card and pencil
✔ **Full-coverage water-proof patron cape**
✔ Towels
✔ Comb
✔ **Color gloves for stylist** (keep several pairs ready for use)
✔ Plastic hair clips
✔ Hair coloring product and color product tube roller
✔ **Developer and measuring container**
✔ Color applicator bottle – or if you prefer using a color brush and bowl method gather those items
✔ Shampoo and Conditioner
✔ Timer
✔ Any additional implements listed on the manufacturer's directions, such as a plastic cap, and cotton to cushion the cap, etc.

Preparation

- Check the client's patch test for confirmation that all is well and there is no inflammation or other signs of irritation from the hair coloring product.
- Record patch test analysis onto client's record card.
- Analyze the hair according to porosity, elasticity, texture, etc and record observations onto client's record card.
- Confirm the client's wishes as to the shade desired. Refer back to the color swatches and color charts that show the shades planned.
- Have the client to remove all jewelry and secure the items in her purse or pockets. **All metals and materials are subject to damage when coming in contact with hair coloring products**.
- Drape the client for the hair coloring service.
- Perform a strand test. Record the results onto the client's record card.
- With the client's hair dry, part the hair into ***four*** sections
- **Apply stain prevention cream onto the skin at the hairline area of the forehead, face, neck and ears.**

Picture 3: Apply stain protection cream; (single-use cup)

• Mix the hair coloring product and developer following the manufacturer's directions

Product Application

• Select the area of the head that you anticipate as being the most resistant to hair color. **Cosmetic Art Science has determined that on most of the population, the area of most resistance to hair coloring is the <u>hairline and temple areas</u>**.

• **Choose the quarter section that you want to begin with.**

• **Using the rat tail of the applicator brush or the tip of the applicator bottle, part the hair into a 1/4th inch subsection.**

• Hold the subsection somewhat perpendicular to the head and apply the hair color mid strand, **staying 1/2 inch away from the scalp**. Do not apply to the porous ends of the hair yet.

• You will begin processing according to the preliminary strand test results checking for color development along the way.

• Next apply hair coloring mixture to the hair at the scalp, again using the technique of 1/4th inch subsections.

• Next apply color to the ends of the hair by applying and **pulling through.**

• Upon completion of color processing, at the shampoo bowl, apply warm water and work into a lather, then rinse thoroughly

• Use a towel and shampoo or stain remover to remove any stains on the client's skin

• Shampoo and condition as needed to remove color residue

• Towel dry and style as desired

• Report results onto the client's record card and keep on file

• Dispose of all single-use materials

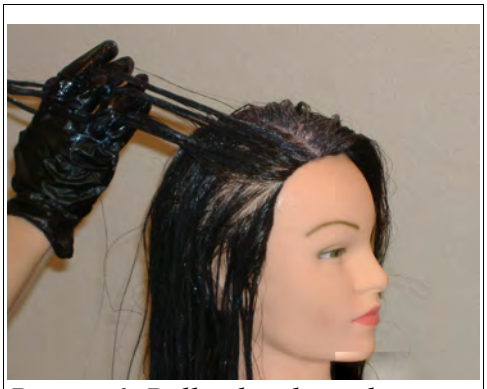
• Seal containers, wipe them down and properly store them

• Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation

• Properly sanitize your hands with adequate soap and water

Picture 4: Part the hair into 1/4" subsection

Picture 5: Apply color to mid section staying 1/2" away from scalp



Picture 6: Pull color through to ends

Single-process Retouch

After several weeks have gone by since the single-process hair coloring application, the hair will begin to show new growth making it necessary to do a retouch service.
A retouch is defined as: the act of coloring new growth to match the previously colored hair and refreshing the ends that have faded.
With a single-process retouch, you use the same methods of preparation for the client as you did for the original service. You will also perform a consultation, a patch test and a preliminary strand test as customary for a single-process hair coloring service.

Procedures for a Single-Process Retouch

Implements
✔ Color swatches and color charts
✔ Client record card and pencil
✔ Full-coverage water-proof patron cape
✔ Towels
✔ Comb
✔ Color gloves for stylist (keep several pairs ready for use)
✔ Plastic hair clips
✔ Hair coloring product and color product tube roller
✔ Developer and measuring container
✔ Color applicator bottle – or if you prefer using a color brush and bowl method gather those items
✔ Shampoo and Conditioner
✔ Timer
✔ Any additional implements listed on the manufacturer's directions, such as a plastic cap, and cotton to cushion the cap, etc.

Preparation
- Check the client's patch test for confirmation that all is well and there is no inflammation or other signs of irritation from the hair coloring product.
- **Record patch test analysis onto client's record card.**
- **Analyze the hair according to porosity, elasticity, texture**, etc and record observations onto client's record card.
- Confirm the client's wishes as to the shade desired. Refer back to the color swatches and color charts that show the shades planned.
- Have the client to remove all jewelry and secure the items in her purse or pockets. All metals and materials are subject to damage when coming in contact with hair coloring products.
- Drape the client for the hair coloring service.

- Perform a strand test. Record the results onto the client's record card.
- With the client's hair dry, part the hair into four sections
- **Apply stain prevention cream onto the skin at the hairline area of the forehead, face and neck and around the ears**.
- **Mix the hair coloring product and developer following the manufacturer's directions**

Product Application

- **Select the area of the head that you anticipate as being the most resistant to hair color.**
- Choose the quarter section that you want to begin with.
- Using the rat tail of the applicator brush or the tip of the applicator bottle, **part the hair into a 1/4th inch subsection.**
- Hold the subsection somewhat perpendicular to the head and **apply the hair color to the new growth only.** Do not overlap the color product on previously colored hair.
- You will begin processing according to the preliminary strand test results checking for color development along the way.
- If the ends are greatly faded, you can apply a hair coloring product mixture that is deposit only that will match the newly colored regrowth. If the ends are only slightly faded you can simply rinse the retouch product mixture through to the ends, checking for color results along the way, then rinse.

Picture 7: Part the hair into 1/4" subsection

- Upon completion of color processing, at the shampoo bowl, apply warm water and work into a lather, then rinse thoroughly
- **Use a towel and shampoo or stain remover to remove any stains on the client's skin**
- Shampoo and condition as needed to remove color residue
- Towel dry and style as desired
- Report results onto the client's record card and keep on file
- **Dispose of all single-use materials**
- **Seal containers, wipe them down and properly store them**
- **Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation**
- **Properly sanitize your hands with adequate soap and water**

Picture 8: Apply hair color to the new growth

Semi-permanent Hair Coloring

Semi-permanent hair coloring products are applied with a different technique than permanent hair coloring single-process applications. However, you will see similarities in the procedures.

Implements

✔ Color swatches and color charts
✔ Client record card and pencil
✔ Full-coverage water-proof patron cape
✔ Towels
✔ Comb
✔ Color gloves for stylist (keep several pairs ready for use)
✔ Plastic hair clips
✔ Hair coloring product
✔ Color applicator bottle – or if you prefer using a color brush and bowl method gather those items
✔ Shampoo and Conditioner
✔ Timer
✔ Any additional implements listed on the manufacturer's directions, such as a plastic cap, and cotton to cushion the cap, etc.

Picture 9: Apply stain protection cream; (single-use cup)

Preparation

- Check the client's patch test for confirmation that all is well and there is no inflammation or other signs of irritation from the hair coloring product.
- Record patch test analysis onto client's record card.
- Analyze the hair according to porosity, elasticity, texture, etc and record observations onto client's record card.
- Confirm the client's wishes as to the shade desired. Refer back to the color swatches and color charts that show the shades planned.
- Have the client to remove all jewelry and secure the items in her purse or pockets. All metals and materials are subject to damage when coming in contact with hair coloring products.
- Drape the client for the hair coloring service.
- Perform a strand test. Record the results onto the client's record card.
- **Apply stain prevention cream onto the skin at the hairline area of the forehead, face and neck and around the ears.**
- Prepare the hair coloring product

Picture 10: Part the hair into 1/2" subsection

Product Application

- Select the quarter section that you want to begin with
- Using the rat tail of the applicator brush or the tip of the applicator bottle, **part the hair into 1/2 inch partings**
- **Apply color to the hair closest to the scalp** – the area that would be considered the new growth of the strand. **Apply to all of the scalp area in !/2 inch partings throughout each section.**
- After applying the semi-permanent hair coloring product to all the scalp area in each of the four sections, apply color and **pull through to the rest of the hair strands to the ends**
- Set your timer to time processing
- If your color product manufacturer requires the use of a plastic cap, follow the instructions for that product
- Upon reaching the desired results, shampoo and condition as needed to remove color residue
- Towel dry and style as desired
- Report results onto the client's record card and keep on file
- Dispose of all single-use materials
- Seal containers, wipe them down and properly store them
- Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation
- Properly sanitize your hands with adequate soap and water

Picture 11: Apply color to hair closest to the scalp

Picture 12: Apply to all the scalp area in 1/2" partings

Picture 13: Pull through to ends

There are always new products coming out in the market place for semi-permanent hair coloring products.
The above procedures are the basic customary steps in coloring using a semi-permanent product, however always read the manufacturer's enclosures and labels for best results.

Tips and Solutions

With any type of hair coloring product application, excellent results is always the goal. Knowing approaches for solving color problems and mistakes is invaluable. There seems to be an endless list of bad outcomes that can develop unexpectedly when using hair coloring products. There are many tried and true tips and solutions that we can put into action when problem issues occur.

Here a few tips and solutions.

- **Chlorine in swimming pools can cause hair to acquire a green tone.** There are products designed especially for that problem. They are designed to remove mineral buildup. **If you use a mineral buildup remover and the hair still has a green tone, you can apply a no-lift deposit-only hair coloring product to neutralize the green.** Observe the off color and it's undertones to determine which complementary color to use.
- **The hair is *less* likely to turn brassy (orange) when lifting brown hair if a blue based permanent color is used.**
- **If lightening the hair more than 2 levels, you can expect brassy tones and you should be prepared to do a second step toner or glaze that deposits a neutralizing complementary color.**
- If highlights turn out too light, you can use a deposit-only color or glaze to darken the entire head
- If highlights turn out too light you can also choose to create lowlights using foils to weave darkness back into the hair to tone it down.
- **Always use an equivalent ratio of an off color's complementary color to neutralize it**. **If the main color to be neutralized is a primary color, then use a primary color to neutralize it**. **If the main color to be neutralized is a secondary color, then use a secondary color to neutralize it.**
- For red hair, if you prefer a more warm coppery red, use a red-orange based color.
- For red hair, if you prefer a more true red, use red to red-violet.
- Only use a deposit-only color to refresh colored hair.
- If the hair turns out too dark, you can use a color remover product on it. Process per the manufacturer's instructions and watch for results. When the hair lifts to the desired level, remove product per manufacturer's instructions.
- Do not mix hair coloring products until you are ready to use them.
- Do not overlap color. It will create a line of demarcation and could also make the hair brittle where it overlaps.

Baliage Highlighting Technique

Baliage or Balayage, is a free-hand or free-form technique of applying lightener.
Using a lightly loaded color brush, you apply a slender line of lightener product mixture to the external layer of dry styled hair. This technique is an excellent way to create subtle highlights especially in all-one-length hair. It touches only the outer layer so
it does limit the area in which you will see them.
The colorist uses very thin long strokes.
Baliage is usually one of the more affordable hair coloring services available in the modern salon.

Picture 14: Baliage highlighting technique

Implements

✔ Color swatches and color charts
✔ Client record card and pencil
✔ Full-coverage water-proof patron cape
✔ Towels
✔ Color gloves for stylist
✔ Hair lightener product
✔ Color brush and bowl
✔ Shampoo and Conditioner
✔ Timer

Preparation

- Perform client consultation and hair and scalp analysis and record finding onto the client's record card
- Using shade charts /color swatches and styling books, confirm the client's wishes as to the shade desired and to how many highlights the client desires
- Have the client to remove all jewelry and secure the items in her purse or pockets.
- Drape the client for the hair coloring service.
- Prepare the client's hair – it must be dry and styled before beginning the bialage highlighting technique service .
- Perform a preliminary strand test and record the results onto the client's record card
- Prepare the hair lightener product

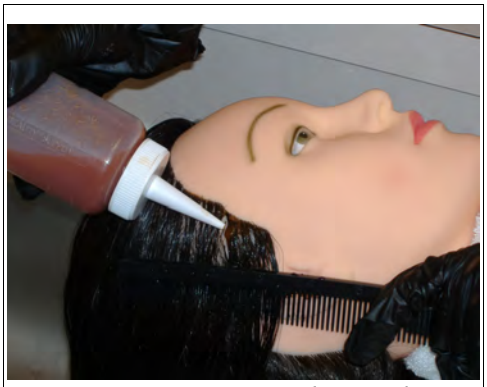
Product Application

- Select the area that you want to begin with
- Using a lightly loaded color brush, begin at the top of the head and paint a very slender line from scalp to ends using the edge of the bristles as not to apply too thickly
- Work your way around the entire head according to how many highlights or how few the client desires
- Upon reaching the desired results, shampoo and condition as needed to remove color residue
- Towel dry and style as desired
- Report results onto the client's record card and keep on file
- Dispose of all single-use materials
- Seal containers, wipe them down and properly store them
- Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation
- Properly sanitize your hands with adequate soap and water

Temporary Hair Coloring

There are various types of temporary hair coloring products on the market. The formats can vary and include: mascara style, that is applied using a wand applicator, gel, mousse, spray-on, shampoo-in, and color liquids also called color rinse.

The following application outlines the proper procedures using a color rinse. Color rinses are very popular for home or salon use. It's most used when an all-over application is desired.



Picture 15: Temporary hair coloring application

Implements

✔ Shampoo cape
✔ Towels
✔ Comb
✔ Gloves
✔ Temporary Hair Coloring Product
✔ Applicator Bottle
✔ Record Card and Pencil

Preparation

Perform a Client Consultation
Have the client to remove all jewelry and store it in her pocket book or pockets

Procedure

- Drape the client for a hair coloring service
- Recline client at shampoo bowel and prepare them for the service
- Shampoo and towel dry the hair
- Read product instructions and shake produce if required before applying
- Apply the color product starting at the hairline and comb throughout hair shafts to ends
- Apply color as needed for coverage over the entire head while combing
- Do not rinse the hair but blot any excess product from the hair with a towel
- Dry and style as desired
- Report results onto the client's record card and keep on file
- Dispose of all single-use materials
- Seal containers, wipe them down and properly store them
- Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation
- Properly sanitize your hands with adequate soap and water

Study the following terms and definitions.

Terms and Definitions:

aniline dye	an·i·line [an-l-in] Origin: 1860–65 *any of a large number of synthetic dyes derived from aniline, usually obtained from coal tar.
decolorization	de·col·or·iza·tion [dē-ˌkəl-ə-rə-ˈzā-shən] Origin:1830–40 *the act of displacing and eliminating melanin pigment in the hair
developer	de·vel·op·er [dih-vel-uh-per] Origin: 1825–35 *an agent that when added to an oxidative hair coloring product creates a chemical reaction using oxygen to form color dyes in order to stain hair
eumelanin	Eu·mel·a·nin [yoo-mel-uh-nin] *the pigment that is found in natural hair that gives it tonal hues of blacks and browns
hydrogen peroxide	Origin: 1870–75 *a colorless liquid, H_2O_2, used chiefly as an antiseptic and a bleaching agent
level	lev·el [lev-uhl] Origin: 1300–50 Middle English, variant of livel - plummet line, level, diminutive of lībra balance, scales; for formation *position or status in a scale of values; *amount or degree of progress; stage; *A relative degree, as of intensity or concentration

melanin	mel·a·nin [mel-uh-nin] Origin: 1835–45 *any of a group of pigments present in the hair
oxidation	ox·i·da·tion [ok-si-dey-shuh n] Origin: 1785–95 *the chemical combination of a substance with oxygen
pheomelanin	*Pheomelanin is the pigment that is found in natural hair that gives it tonal hues of blonds and reds.
primary colors	*the 3 pure colors that can not be created by combining other colors: *yellow, red, blue
Secondary colors	*the colors created from combining equal parts of 2 primary colors: *orange, green, violet
tertiary colors	the colors created when combining equal amounts of a primary color and it's neighboring secondary color on the color wheel: *yellow-orange, yellow-green, red-orange, blue-green, red-violet, blue-violet

Lesson 2 Summary

In this lesson we have discussed scientific facts regarding Hair Lightening and Decolorization. We understand the importance of the Preliminary Strand Test. We have reviewed Permanent Hair Coloring Products as well as the method of Single-process Hair Coloring Application. We have reviewed and understand the method of the Single-process Retouch as well as the method of the Semi-permanent Hair Coloring Application. We have also reviewed irreplaceable methods of Trouble-shooting. And lastly we can accurately describe the Baliage Free-hand Application method. It is important to continue learning new methods and to maintain practice of the existing tried and true methods. We now turn our attention to the next topic: Sanitation and Sterilization.

Lesson 3: Sanitation and Sterilization (2 hours)

Outline

- Standard cleaning and disinfecting precautions
- How to distinguish between disinfectants and antiseptics
- How to sanitize hands and disinfect tools used in the practice of cosmetology
- Bacterial, viral, and fungal control
- Bloodborne pathogens control
- Parasite infection and infestation control

Learning objectives

After completing this lesson you will be able to

- identify cleaning precautions
- describe cleaning routines
- describe the importance of reading labels
- define the term clean
- describe the properties of ideal disinfectants
- identify sterilization
- describe wet disinfection
- define the purpose of infection control
- list safety and sanitation requirements
- describe cleaning and disinfecting procedures
- identify salon environment requirements
- identify CDC infection control guidelines
- describe chlorine based disinfectants
- describe phenol based disinfectants
- describe QAC based disinfectants
- list types of sterilization techniques
- identify lice and infestation

Introduction

In this chapter we will identify standard cleaning and disinfecting precautions, disinfectants and antiseptics, hand sanitation, tool disinfection, bacterial, viral, and fungal control, bloodborne pathogens control, and parasite infection and infestation control.

Standard Cleaning and Disinfecting Precautions

Protect Yourself

We must take precautions and heed the warnings of all labels regarding the handling, use and storage of cleaning chemicals. We will go more into an in-depth study of specific safety issues when we study OSHA regulations later in this course. Just bear in mind that we must observe all safety rules and regulations at all times when preparing, mixing, and applying chemicals. Follow all label instructions without alteration. Only use chemicals deigned for the specific material you are cleaning, otherwise damage may occur.

Protect Your Clients

There are Federal and State Guidelines that the personal service worker must adhere to in order to protect each and every client as well as the salon worker.

How should cleaners and disinfectants be used?
Read the label first. Each cleaner and disinfectant has instructions on the label that tell you important facts:

- How to apply the product to a surface.
- How long you need to leave it on the surface to be effective (contact time).
- If the surface needs to be cleaned first and rinsed after using.
- If the disinfectant is safe for the surface.
- Whether the product requires dilution with water before use.
- Precautions you should take when applying the product, such as wearing gloves or aprons or making sure you have **good ventilation** during application.

Facility Cleaning & Disinfection

Cleaning and disinfection should be performed on surfaces that are likely to contact your patron.

- ***Cleaning surfaces with detergent-based cleaners or Environmental Protection Agency (EPA)-registered disinfectants is effective at removing germs, viruses and fungi from the environment.***
- It is important to read the instruction labels on all cleaners to make sure they are used safely and appropriately.
- Environmental cleaners and disinfectants should not be used to treat the skin
- The EPA provides a list of EPA-registered products

Illustration 1: Cleaning surfaces

Surfaces to Clean

Focus on surfaces that touch people's bare skin each day and any surfaces that could come into contact with people. Clean large surfaces such as floors and walls when they become visibly soiled or on a regular schedule. There is no evidence that spraying or fogging rooms or surfaces with disinfectants will prevent infections more effectively than the targeted approach of cleaning frequently touched surfaces and any surfaces that have been exposed to infections.

Shared Equipment

Shared equipment that comes into direct skin contact should be cleaned after each use and allowed to dry. Salon equipment, and protective gear, should also be cleaned according to the equipment manufacturers' instructions to make sure the cleaner will not harm the item.

Cleaning Keyboards and other Difficult Surfaces

Many items such as computer keyboards or handheld electronic devices may be difficult to clean or disinfect or they could be damaged if they became wet. If these items are touched by many people during the course of the day, a cleanable cover/skin could be used on the item to allow for cleaning while protecting the item. Always check to see if the manufacturer has instructions for cleaning.

Laundry
Routine laundry procedures, detergents, and laundry additives will all help to make clothes, towels, and linens safe to wear or touch. If items have been contaminated by infectious material, these may be laundered separately, but this is not absolutely necessary.

Proper Water Temperature for Laundry

Read and follow the clothing and soap or detergent label instructions. Water temperatures for laundry depend on the type of fiber or fabric. In general, wash and dry in the warmest temperatures recommended on the fabric label. Also, some laundry detergents are made to clean best at certain temperatures. Not following instructions could damage the item or decrease the effectiveness of the detergent.

Using Bleach for Laundry

Use of bleach as a disinfectant in laundering is optional, and not all fabrics are suitable for bleach. Read the label instructions.

Routines

- Facilities should always be kept clean.
- Review cleaning procedures and schedules with the staff.
  - ❍ Cleaning procedures should focus on commonly touched surfaces and surfaces that come into direct contact with people's bare skin each day.
  - ❍ Cleaning with detergent-based cleaners or Environmental Protection Agency (EPA)-registered detergents/disinfectants will remove bacteria from surfaces.
  - ❍ Cleaners and disinfectants, including household chlorine bleach, can be irritating and exposure to these chemicals has been associated with health problems such as asthma and skin and eye irritation.
    - ❒ Take appropriate precautions described on the product's label instructions to reduce exposure. Wearing personal protective equipment such as gloves and eye protection may be indicated.
  - ❍ Follow the instruction labels on all cleaners and disinfectants, including household chlorine bleach, to make sure they are used safely and correctly.
    - ❒ Some key questions that should be answered by reading the label include:
      - ❒ How should the cleaner or disinfectant be applied?
      - ❒ Do you need to clean the surface first before using the disinfectant (e.g., precleaned surfaces)?
      - ❒ Is it safe for the surface? Some cleaners and disinfectants, including household chlorine bleach, might damage some surfaces (e.g., metals, some plastics).
      - ❒ How long do you need to leave it on the surface to be effective (i.e., contact time)?
      - ❒ Do you need to rinse the surface with water after using the cleaner or disinfectant?
  - ❍ If you are using household chlorine bleach, check the label to see if the product has specific instructions for disinfection.
  - ❍ Environmental cleaners and disinfectants should not be put onto skin or wounds and should never be used to treat infections.

- Repair or dispose of equipment and furniture with damaged surfaces that do not allow surfaces to be adequately cleaned.

How to distinguish between disinfectants and antiseptics, How to sanitize hands and disinfect tools used in the practice of cosmetology, Bacterial, viral, and fungal control, Bloodborne pathogens control, and Parasite infection and infestation control

First, let's review disinfectants

What's the difference between cleaners, sanitizers, and disinfectants?

- **Cleaners or detergents** are products that are used to remove soil, dirt, dust, organic matter, and germs (like **bacteria, viruses, and fungi**). Cleaners or detergents work by washing the surface to lift dirt and germs off surfaces so they can be rinsed away with water. The same thing happens when you wash your hands with soap and water or when you wash dishes. Rinsing is an important part of the cleaning process. Use these products for routine cleaning of surfaces.
- **Sanitizers** are used to reduce **germs** from surfaces but not totally get rid of them. Sanitizers reduce the germs from surfaces to levels that are considered safe.
- **Disinfectants** are chemical products that **destroy or inactivate germ**s and prevent them from growing. Disinfectants have no effect on dirt, soil, or dust. Disinfectants are regulated by the U.S. Environmental Protection Agency (EPA).

CDC – Infection Control Guidelines
The Centers for Disease Control and Prevention (CDC) have developed Guidelines for Disinfection and Sterilization.

They provide the following information:

Cleaning is the removal of foreign material (e.g., soil, and organic material) from objects and is normally accomplished using water with detergents or enzymatic products. Thorough cleaning is required before high-level disinfection and sterilization because inorganic and organic materials that remain on the surfaces of salon implements and equipment interfere with the effectiveness of disinfection and sterilization.
Also, if soiled materials dry, the removal process becomes more difficult and the disinfection or sterilization process less effective or ineffective.
With manual cleaning, the two essential components are friction and soap/detergents and water.
Friction (e.g., rubbing/scrubbing the soiled area with a brush) is an old and dependable method.
Soap/detergents and water is used to remove soil and debris.

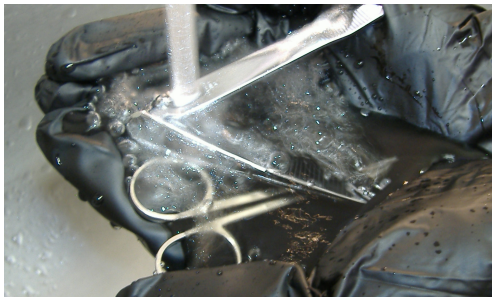


Illustration 2: Wash with soap and water

Disinfection
Many chemical disinfectants are used alone or in combinations. These include chlorine and chlorine compounds, phenolics, and quaternary ammonium compounds. Commercial formulations based on these chemicals are considered unique products and must be registered with EPA or cleared by FDA. In most instances, a given product is designed for a specific purpose and is to be used in a certain manner. Therefore, users should read labels carefully to ensure the correct product is selected for the intended use and applied efficiently.

Disinfectants are not interchangeable, and incorrect concentrations and inappropriate disinfectants can result in excessive costs. Because occupational diseases have been associated with use of several disinfectants such as chlorine, precautions (e.g., gloves and proper ventilation) should be used to minimize exposure.
Asthma and reactive airway disease can occur in sensitized persons exposed to any airborne chemical, including germicides.

Clinically important asthma can occur at levels below ceiling levels regulated by OSHA (Occupational Safety and Health Administration) or recommended by NIOSH (the National Institute for Occupational Safety and Health).

The following is information that can be used to select an appropriate disinfectant for any item and use it in the most efficient way.

Properties of an ideal disinfectant

- Broad spectrum: should have a wide antimicrobial spectrum
- Fast acting: should produce a rapid kill
- Not affected by environmental factors: should be active in the presence of organic matter (e.g., blood, sputum, feces) and compatible with soaps, detergents, and other chemicals encountered in use
- Nontoxic: should not be harmful to the user or patron
- Surface compatibility: should not corrode instruments and metallic surfaces and should not cause the deterioration of cloth, rubber, plastics, and other materials
- Residual effect on treated surfaces: should leave an antimicrobial film on the treated surface
- Easy to use with clear label directions
- Odorless: should have a pleasant odor or no odor to facilitate its routine use
- Economical: should not be prohibitively high in cost
- Solubility: should be soluble in water
- Stability: should be stable in concentrate and use-dilution
- Cleaner: should have good cleaning properties
- Environmentally friendly: should not damage the environment on disposal

Barbicide

Barbicide is a disinfectant solution used by barbers and cosmetologists for sterilizing grooming tools such as combs and hair-cutting shears. Manufactured by King Research, it was invented in 1947 by Maurice King and marketed heavily around the United States by his brother James.

Illustration 3: Barbicide jar

Barbicide is a United States Environmental Protection Agency approved combination germicide, pseudomonacide, fungicide, and a viricide effective against the HIV-1 virus (AIDS virus), Hepatitis B, and Hepatitis C. Its active ingredient is Alkyl dimethyl benzyl ammonium chloride (5.12% by volume); sodium nitrite and blue dye are also present. Contact can cause irritation to the skin and eyes, and consumptionof 50 mL can cause shock and may lead to death if not treated quickly.

Barbicide is sold as a concentrate diluted for use in a 1:32 ratio with water, with each stylist having a container for treating their own tools. At one time, several US states legally required barber shops to use Barbicide; according to the maker two still did in 1997. A jar of Barbicide sits on display in the Smithsonian Institution's National Museum of American History.

Chlorine and Chlorine Compounds

Illustration 4: Bleach

Hypochlorites, the most widely used of the chlorine disinfectants, are available as liquid (e.g., sodium hypochlorite) or solid (e.g., calcium hypochlorite).
The most prevalent chlorine products in the United States are aqueous solutions of 5.25%–6.15% ***sodium hypochlorite, usually called household bleach***. They have a broad spectrum of antimicrobial activity, do not leave toxic residues, are unaffected by water hardness, are inexpensive and fast acting, remove dried or fixed organisms and biofilms from surfaces, and have a low incidence of serious toxicity. Sodium hypochlorite at the concentration used in household bleach (5.25-6.15%) can produce ocular irritation or oropharyngeal, esophageal, and gastric burns. Other disadvantages of hypochlorites include corrosiveness to metals in high concentrations (>500 ppm), inactivation by organic matter, discoloring or "bleaching" of fabrics, and the ***release of toxic chlorine gas when mixed with ammonia or other household cleaning agents.***

EPA has determined the currently registered uses of hypochlorites will not result in unreasonable adverse effects to the environment.

Phenols

Illustration 5: Lysol concentrate

Phenol has occupied a prominent place in the field of disinfection since its initial use as a germicide by Lister in his pioneering work on antiseptic surgery. In the past 30 years, however, work has concentrated on the numerous phenol derivatives or phenolics and their antimicrobial properties. Phenol derivatives originate when a functional group (e.g., alkyl, phenyl, benzyl, halogen) replaces one of the hydrogen atoms on the aromatic ring. Two phenol derivatives commonly found as constituents of disinfectants are *ortho*-phenylphenol and *ortho*-benzyl-*para*-chlorophenol. The antimicrobial properties of these compounds and many other phenol derivatives are much improved over those of the parent chemical. Phenolics are absorbed by porous materials, and the residual disinfectant can irritate the skin.

Examples of phenol disinfectant cleaners are Pine-Sol and Lysol.

Microbicidal Activity of Phenols
Published reports on the antimicrobial efficacy of commonly used phenolics showed they were bactericidal, fungicidal, virucidal, and tuberculocidal at their recommended use-dilution.

Quaternary Ammonium Compounds
Quaternary Ammonium Compounds (QACs) are a type of chemical that is used to kill bacteria, viruses, and mold. QACs are widely used as disinfectants. The quaternaries are good cleaning agents, but high water hardness and materials such as cotton and gauze pads can make them less microbicidal because of insoluble precipitates or cotton and gauze pads absorb the active ingredients, respectively .

Illustration 6: Quaternary disinfectant

Examples of QAC products are Lysol Spray and Clorox Disinfectant Spray.

Microbicidal Activity of QACs
Results from manufacturers' data sheets and from published scientific literature indicate that the quaternaries sold as hospital grade disinfectants are generally fungicidal, bactericidal, and virucidal against most viruses.

Salon Computer Keyboards
Quaternary ammonium compounds (as well as 70% isopropyl alcohol, phenolic, and a chlorine-containing wipes effectively (>95%) remove and/or inactivate contaminants from computer keyboards with a 5-second application time. No functional damage or cosmetic changes occurred to the computer keyboards after 300 applications of the disinfectants.

EPA and FDA
In the United States, chemical germicides formulated as sanitizers, disinfectants, or sterilants are regulated in interstate commerce by the Antimicrobials Division, Office of Pesticides Program, EPA, under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947, as amended .
Under FIFRA, any substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest (including microorganisms but excluding those in or on living humans or animals) must be registered before sale or distribution.
To obtain a registration, a manufacturer must submit specific data about the safety and effectiveness of each product. For example, EPA requires manufacturers of sanitizers, disinfectants, or chemical sterilants to test formulations by using accepted methods for microbiocidal activity, stability, and toxicity to animals and humans.
The manufacturers submit these data to EPA along with proposed labeling. If EPA concludes the product can be used without causing "unreasonable adverse effects," then the product and its labeling are registered, and the manufacturer can sell and distribute the product in the United States.

Sterilization
Sterilization destroys all microorganisms on the surface of an article or in a fluid to prevent disease transmission associated with the use of that item. The use of inadequately sterilized items represents a high risk of transmitting pathogens.
The concept of what constitutes "sterile" is measured as a probability of sterility for each item to be sterilized.
This probability is commonly referred to as the sterility assurance level (SAL) of the product and is defined as the probability of a single viable microorg anism occurring on a product after sterilization. SAL is normally expressed a 10.
For example, if the probability of a spore surviving were one in one million, the SAL would be 10^{-6}. In short, a SAL is an estimate of lethality of the entire sterilization process and is a conservative calculation.

Liquid Chemicals
Several FDA-cleared liquid chemical sterilants include indications for sterilization of implements. The indicated contact times range from 3 hours to 12 hours. These solutions are commonly used as high-level disinfectants when a shorter processing time is required.

Ultraviolet Radiation (UV)

UV radiation has been used in the disinfection of drinking water, air, and contact lenses. Bacteria and viruses are more easily killed by UV light than are bacterial spores.

The wavelength of UV radiation ranges from 328 nm to 210 nm (3280 A to 2100 A). Its maximum bactericidal effect occurs at 240–280 nm. Mercury vapor lamps emit more than 90% of their radiation at 253.7 nm, which is near the maximum microbicidal activity. Inactivation of microorganisms results from destruction of nucleic acid through induction of thymine dimers.

Illustration 7: UV Sterilizer

Hand-hygiene

Washing hands at key times with soap and water is one of the most important steps you can take to get rid of germs and avoid spreading germs to those around you.

Illustration 8: Washing hands

How can washing your hands keep you healthy?

Germs can get into the body through our eyes, nose, and mouth and make us sick.

Handwashing with soap removes germs from hands and helps prevent sickness. Studies have shown that handwashing can prevent 1 in 3 diarrhea-related sicknesses and 1 in 5 respiratory infections, such as a cold or the flu.

Handwashing helps prevent infections for these reasons:

People often touch their eyes, nose, and mouth without realizing it, introducing germs into their bodies. Germs from unwashed hands may get into foods and drinks when people prepare or consume them. Germs can grow in some types of foods or drinks and make people sick. Germs from unwashed hands can be transferred to other objects, such as door knobs, tables, or toys, and then transferred to another person's hands.

What is the correct way to wash your hands?

1. Wet your hands with clean running water (warm or cold) and apply soap.
2. Lather your hands by rubbing them together with the soap.
3. Scrub all surfaces of your hands, including the palms, backs, fingers, between your fingers, and under your nails. Keep scrubbing for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song twice.
4. Rinse your hands under clean, running water.
5. Dry your hands using a clean towel or air dry them.

When should you wash your hands?

• Before, during, and after preparing food

• Before eating food

• Before and after caring for someone who is sick

• Before and after treating a cut or wound

• After using the bathroom, changing diapers, or cleaning up a child who has used the bathroom

• After blowing your nose, coughing, or sneezing

• After touching an animal, animal food or treats, animal cages, or animal feces (poop)

• After touching garbage

• If your hands are visibly dirty or greasy

What type of soap should you use?
You can use bar soap or liquid soap to wash your hands. Many public places provide liquid soap because it's easier and cleaner to share with others. Studies have not found any added health benefit from using soaps containing antibacterial ingredients when compared with plain soap. Both are equally effective in getting rid of germs. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol.

Hand Sanitizers
Washing hands with soap and water is the best way to reduce the number of germs on them in most situations. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol. Alcohol-based hand sanitizers can quickly reduce the number of germs on hands in some situations, but sanitizers do **not** eliminate all types of germs and might not remove harmful chemicals.

Hand sanitizers are not as effective when hands are visibly dirty or greasy.

How do you use hand sanitizers?

- Apply the product to the palm of one hand (read the label to learn the correct amount).
- Rub your hands together.
- Rub the product over all surfaces of your hands and fingers until your hands are dry.

Nail Hygiene
Appropriate hand hygiene includes diligently cleaning fingernails, which may harbor dirt and germs and can contribute to the spread of some infections. Before clipping or grooming nails, all equipment should be properly cleaned. Sterilizing equipment before use is especially important. Infections of the fingernails are often characterized by swelling of the surrounding skin, pain in the surrounding area, or thickening of the nail. In some cases, these infections may be serious and need to be treated by a physician.

To help prevent the spread of germs and nail infections:

- Scrub the underside of nails with soap and water (or a nail brush) every time you wash your hands.

- Clean any nail grooming tools before use.
- Sterilize nail grooming tools before use.
- Avoid biting or chewing nails.
- Avoid cutting cuticles, as they act as barriers to prevent infection.
- Never rip or bite a hangnail. Instead, clip it with a clean, sanitized nail trimmer.

Global Handwashing Day
Celebrate Global Handwashing Day to promote handwashing with soap throughout the world. Global Handwashing Day is a way to support a global and local culture of handwashing with soap, shine a spotlight on the act of handwashing in each country, and raise awareness about the benefits of handwashing with soap. Since 2008, Global Handwashing Day has been celebrated annually on **October 15** worldwide. The Global Public-Private Partnership for Handwashing with Soap founded Global Handwashing Day and encourages school children, teachers, and families to get involved.

People and communities around the world will celebrate Global Handwashing day in many ways, including:

- Learning how to wash hands the right way through an online video produced by the Centers for Disease Control
- Watching a Facebook Live talk on why handwashing with soap is so important.
- Sharing handwashing lessons, events, and materials for thousands of students across the state of Georgia, where CDC is based.

How does handwashing help fight antibiotic resistance?
Antibiotic resistance occurs when bacteria resist the effects of an antibiotic – that is, germs are not killed and they continue to grow. Sicknesses caused by antibiotic-resistant bacteria can be harder to treat. Simply using antibiotics creates resistance, so avoiding infections in the first place reduces the amount of antibiotics that have to be used and reduces the likelihood that resistance will develop during treatment. Handwashing helps prevent many sicknesses, meaning less use of antibiotics.

Antiseptics
Dictionary.com defines antiseptics as: A substance that inhibits the proliferation of infectious microorganisms. Proliferation is the growth or production of cells by multiplication of parts.

Google explains them this way: antiseptic (anti-sep-tik) n. a chemical, such as **chlorhexidine** or **cetrimide**, that destroys or inhibits the growth of disease-causing bacteria and other microorganisms. Antiseptics are used externally to cleanse wounds and internally to treat infections of the intestine and bladder.

Encyclopedia.com explains antiseptics as:
An antiseptic is a substance that inhibits the growth and development of microorganisms. For practical purposes, antiseptics are routinely thought of as topical agents, for application to skin, mucous membranes, and inanimate objects, although a formal definition includes agents that are used internally, such as the urinary tract antiseptics.

Purpose
Antiseptics are a diverse class of drugs that are applied to skin surfaces or mucous membranes for their anti-infective effects.

This may be either bacteriocidal (kills bacteria) or bacteriostatic (stops the growth of bacteria). Their uses include cleansing of skin and wound surfaces after injury, preparation of skin surfaces prior to injections or surgical procedures, and routine disinfection of the oral cavity as part of a program of oral hygiene. Antiseptics are also used for disinfection of inanimate objects, including instruments and furniture surfaces.

Commonly used antiseptics for skin cleaning include benzalkonium chloride, chlorhexidine, hexachlorophine, alcohol, and hydrogen peroxide.
Other agents that have been used for this purpose, but have largely been supplanted by more effective or safer agents, include boric acid and volatile oils such as methyl salicylate (oil of wintergreen).

Chlorhexidine shows a high margin of safety when applied to mucous membranes, and has been used in oral rinses and preoperative total body washes.

Benzalkonium chloride and hexachlorophine are used primarily as hand scrubs or face washes. Benzalkonium may also find application as a disinfecting agent for instruments, and in low concentration as a preservative for drugs including ophthalmic solutions. Benzalkonium chloride is inactivated by organic compounds, including soap, and must not be applied to areas that have not been fully rinsed.

Hydrogen peroxide acts through the liberation of oxygen gas. Although the antibacterial activity of hydrogen peroxide is relatively weak, the liberation of oxygen bubbles produces an effervescent action, which may be useful for wound cleansing through removal of tissue debris. The activity of hydrogen peroxide may be reduced by the presence of blood and pus. The appropriate concentration of hydrogen peroxide for antiseptic use is 3%, although higher concentrations are available.

Precautions
Precautions vary with individual product and use. Hypersensitivity reactions should be considered with organic compounds such as chlorhexidine, benzalkonium and hexachlorophine. Skin dryness and irritation should be considered with all products, but particularly with those containing alcohol.

Most antiseptics have not been rated according to pregnancy category under the pregnancy risk factor system.
Hexachlorophene is schedule C during pregnancy, and should not be used on newborns due to risk of systemic absorption with potential central nervous system (CNS) effects, including convulsions.

Application of hexachlorophene to open wounds, mucous membranes, or areas of thin skin, such as the genitalia, should be avoided, since this may promote systemic absorption.

Chlorhexidine should not be instilled into the ear. There is one anecdotal report of deafness following use of chlorhexidine in a patient with a perforated eardrum. Safety in pregnancy and breastfeeding have not been reported; however there is one anecdotal report of an infant developing slowed heartbeat apparently related to maternal use of chlorhexidine.

Interactions
Antiseptics are not known to interact with any other skin products. However, they should not be used together with any other topical cream, solution, or ointment.

Parasite infection

Lice infestation

A lice infestation, or pediculosis, is caused by parasites living on human skin. Lice are tiny, wingless insects with sucking mouthparts that feed on human blood and lay eggs on body hair or in clothing. Lice bites can cause intense itching.

There are three related species of human lice:

- head lice, *Pediculus humanus capitis*
- body lice, *Pediculosis humanus corpus*
- pubic lice, *Phthirus pubis*, commonly called crab lice

Pediculosis capitis is an infestation of head lice. A body lice infestation is called pediculosis corporis. Pediculosis palpebrarum or phthiriasis palpebrarum, caused by crab lice, is an infestation of the pubic hair.

Head lice live and crawl on the scalp, sucking blood every three to six hours. Their claws are adapted for clinging to hair or clothing. Adult head lice can be silvery-white to reddish-brown. They are about the size of a sesame seed. Female lice lay their eggs in sacs called nits that are about 0.04 in (1 mm) long and are glued to shafts of hair close to the scalp. During her one-month lifespan a female louse may lay more than 100 eggs. The nymphs hatch in three to 14 days and must feed on blood within one day. Nymphs are smaller and lighter in color than adults and become sexually mature after nine to 12 days.

Body lice lay their nits in clothing or bedding. Occasionally the nits are attached to body hair. Body lice nits are oval and yellow to white in color. They may not hatch for up to 30 days. Nymphs mature in about seven days.

Pubic lice have large front legs and look like tiny crabs. Females are larger than males. Nits hatch in about one week and the nymphs mature in about seven days.

Transmission

Lice are endemic in human populations, spreading through personal contact or contact with infested clothing or other personal items. They can be transmitted when unaffected clothing is stored with infested items. Among children head lice are commonly transmitted by the sharing of hats, combs, brushes, hair accessories, headphones, pillows, and stuffed **toys** . Pubic lice are sexually transmitted, although occasionally they can be transmitted through infested bedding, towels, or clothing.
Lice do not jump, hop, or fly and they do not live on pets. Head lice cannot survive without a human host for more than a few days at most. Body lice can live without human contact for up to 10 days. Pubic lice can survive for one to two weeks without human contact.

Head lice infestations are extremely common among children in schools, childcare facilities, camps, and playgrounds. They are the second most common communicable health problem in children, after the common cold , and appear to be on the increase. Some 6 to 12 million American children get head lice every year. In developing countries more than 50 percent of the general population may be infested. Although anyone can get head lice, children aged three to ten and their families are most affected.

Lice infestations are characterized by intense itching caused by an allergic reaction to a toxin in lice saliva. The itching can interfere with sleep and concentration. Repeated bites can lead to generalized skin eruptions or inflammation. Swelling or inflammation of the neck glands are common complications of head lice.

Prevention

Prevention of lice infestation depends on adequate personal hygiene and consistently not sharing combs, brushes, hair accessories, hats, towels, or bedding. Hair should be checked weekly for lice and nits. Prevention includes sanitation and sterilization of salon equipment and implements as directed using an EPA approved product.

Lesson 3 Summary

In this lesson we have thoroughly discussed the most important aspects of standard cleaning and disinfecting precautions, how to distinguish between disinfectants and antiseptics, and how to sanitize hands and disinfect tools used in the practice of cosmetology. We now understand how to control the spread of bnacterial, viral, and fungal infections. We have also reviewed practices in bloodborne pathogens control as well as parasite infection and infestation control. Personal care service workers must consistently strive to maintain professional sanitation and sterilization methods in order to protect themselves and others in the salon environment. Let us now turn our attention to the next subject: Occupational Safety and Health Administration Regulations.

Lesson 4: <u>Occupational Safety and Health Administration Regulations</u> (2 hours)

Outline

- Hazard Communication Standard
- Safety Data Sheets
- Manufacturer's SDS

Learning objectives

After completing this lesson you will be able to

- list the 16 sections of Safety Data Sheets
- identify the purpose of the Hazard Communication Standard
- list the required sections and it's contents of a Safety Data Sheet
- recognize a manufacturer's SDS

Introduction

With the Occupational Safety and Health Act of 1970, Congress created the Occupational Safety and Health Administration (OSHA) to assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance. OSHA is part of the United States Department of Labor. The administrator for OSHA is the Assistant Secretary of Labor for Occupational Safety and Health. OSHA's administrator answers to the Secretary of Labor, who is a member of the cabinet of the President of the United States.

Hazard Communication Standard

What is Hazard Classification?

Hazard classification is the process of evaluating the full range of available scientific evidence to determine if a chemical is hazardous, as well as to identify the level of severity of the hazardous effect. When complete, the evaluation identifies the hazard class(es) and associated hazard category of the chemical. The HCS defines hazard class as the nature of a physical or health hazard, e.g., flammable solid, carcinogen, and acute toxicity.

Hazard Communication Standard

<u>OSHA's Hazard Communication Standard (HCS) is designed to protect against chemical injuries</u> and illnesses by ensuring that employers and workers are provided with sufficient information to anticipate, recognize, evaluate, and control chemical hazards and take appropriate protective measures. This information is provided through **safety data sheets (SDSs), labels,** and employee training. **In order for SDSs, labels, and training to be effective, the hazard information they convey must be complete a nd accurate.** Thus, it is critically important to obtain comprehensive and correct information about the hazards associated with particular chemicals.

SAFETY DATA SHEETS (SDS)

Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., fire fighting). This information should be helpful to those that need to get the information quickly.

Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

Sections 12 through 15, is required to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.

The following 16 page document is the official manufacturer's Safety Data Sheet for Lysol Brand Disinfectant Concentrate

Conforms to USDOL OSHA 29CFR 1910.1200 HAZCOM

SAFETY DATA SHEET

Lysol Brand Disinfectant Concentrate

HEALTH • HYGIENE • HOME

1. Product and company identification

Product name : Lysol Brand Disinfectant Concentrate

Distributed by : Reckitt Benckiser LLC.
Morris Corporate Center IV
399 Interpace Parkway (P.O. Box 225)
Parsippany, New Jersey 07054-0225
+1 973 404 2600

Emergency telephone number (Medical) : 1-800-338-6167

Emergency telephone number (Transport) : 1-800-424-9300 (U.S. & Canada) CHEMTREC
Outside U.S. and Canada (North America), call Chemtrec:703-527-3887

Website: **http://www.rbnainfo.com**

Product use : Disinfectant.

This SDS is designed for workplace employees, emergency personnel and for other conditions and situations where there is greater potential for large-scale or prolonged exposure, in accordance with the requirements of USDOL Occupational Safety and Health Administration.

This SDS is not applicable for consumer use of our products. For consumer use, all precautionary and first aid language is provided on the product label in accordance with the applicable government regulations, and shown in Section 15 of this SDS.

SDS # : 353773PSDS v3.0

Formulation #: : 269-005 (353773 v10.0)

EPA ID No. : 777-94

UPC Code / Sizes : 19200-02201-10; 19200-77500-10 (12 fl.oz. PET Amber Pour Bottle with CRC cap)

2. Hazards identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 4
SKIN CORROSION/IRRITATION - Category 1C
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Combustible liquid.
Causes severe skin burns and eye damage.

Precautionary statements

2. Hazards identification

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from flames and hot surfaces. - No smoking. Wash hands thoroughly after handling.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Store locked up. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : None known.

Hazards not otherwise classified : None known.

3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
clorofene	5 - 10	120-32-1
potassium hydroxide	2.5 - 5	1310-58-3
Ethyl alcohol	1 - 2.5	64-17-5
Isopropyl alcohol	1 - 2.5	67-63-0

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

4. First aid measures

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

Skin contact : Causes severe burns.

Ingestion : May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Control

Occupational exposure limits

Ingredient name	Exposure limits
potassium hydroxide	**ACGIH TLV (United States, 6/2013).** C: 2 mg/m³ **OSHA PEL 1989 (United States, 3/1989).** CEIL: 2 mg/m³ **NIOSH REL (United States, 10/2013).** TWA: 2 mg/m³ 10 hours.
Ethyl alcohol	**ACGIH TLV (United States, 6/2013).** STEL: 1000 ppm 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** TWA: 1000 ppm 8 hours. TWA: 1900 mg/m³ 8 hours. **NIOSH REL (United States, 10/2013).** TWA: 1000 ppm 10 hours. TWA: 1900 mg/m³ 10 hours. **OSHA PEL (United States, 2/2013).**

8. Exposure controls/personal protection

	TWA: 1000 ppm 8 hours. TWA: 1900 mg/m³ 8 hours.
Isopropyl alcohol	**ACGIH TLV (United States, 6/2013).** TWA: 200 ppm 8 hours. STEL: 400 ppm 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** TWA: 400 ppm 8 hours. TWA: 980 mg/m³ 8 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m³ 15 minutes. **NIOSH REL (United States, 10/2013).** TWA: 400 ppm 10 hours. TWA: 980 mg/m³ 10 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m³ 15 minutes. **OSHA PEL (United States, 2/2013).** TWA: 400 ppm 8 hours. TWA: 980 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

8. Exposure controls/personal protection

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. Physical and chemical properties

Appearance

Physical state : Liquid. [Clear.]

Color : Red.

Odor : soap

Odor threshold : Not available.

pH : 10.3 to 11.1 [Conc. (% w/w): 100%]

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: 62.8°C (145°F)

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1.024 to 1.034

Solubility : Easily soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Reactive or incompatible with the following materials:
oxidizing materials

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
clorofene	LD50 Oral	Rat	1700 mg/kg	-
Ethyl alcohol	LC50 Inhalation Vapor	Rat	124700 mg/m³	4 hours
	LD50 Oral	Rat	7 g/kg	-
Isopropyl alcohol	LD50 Dermal	Rabbit	12800 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
*Lysol Brand Disinfectant Concentrate, Original Scent	LC50 Inhalation Vapor	Rat	>2.07 mg/l	4 hours
	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-

Conclusion/Summary : Not classified Harmful. *Information is based on toxicity test result of a similar product.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
clorofene	Skin - Mild irritant	Human	-	48 hours 1 Percent	-
potassium hydroxide	Eyes - Moderate irritant	Rabbit	-	24 hours 1 milligrams	-
	Skin - Severe irritant	Guinea pig	-	24 hours 50 milligrams	-
	Skin - Severe irritant	Human	-	24 hours 50 milligrams	-
	Skin - Severe irritant	Rabbit	-	24 hours 50 milligrams	-
Ethyl alcohol	Eyes - Moderate irritant	Rabbit	-	0.066666667 minutes 100 milligrams	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	100 microliters	-
	Eyes - Severe irritant	Rabbit	-	500 milligrams	-
	Skin - Mild irritant	Rabbit	-	400 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
Isopropyl alcohol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
*Lysol Brand Disinfectant Concentrate, Original Scent	Skin - Visible necrosis	Rabbit	-	240 minutes	14 days
	Eyes - Cornea opacity	Rabbit	>3	-	-

Conclusion/Summary

Skin : Causes burns. *Information is based on toxicity test result of a similar product.

Eyes : Causes irreversible eye damage *Information is based on toxicity test result of a similar product.

Sensitization

11. Toxicological information

Product/ingredient name	Route of exposure	Species	Result
*Lysol Brand Disinfectant Concentrate, Original Scent	skin	Guinea pig	Not sensitizing

Conclusion/Summary

Skin : Non-sensitizer to skin. *Information is based on toxicity test result of a similar product.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Ethyl alcohol	-	1	-
Isopropyl alcohol	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Isopropyl alcohol	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

Skin contact : Causes severe burns.

Ingestion : May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

11. Toxicological information

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
clorofene	Acute EC50 0.59 ppm Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 0.33 ppm Fresh water	Fish - Lepomis macrochirus	96 hours
potassium hydroxide	Acute LC50 80 ppm Fresh water	Fish - Gambusia affinis - Adult	96 hours
Ethyl alcohol	Acute EC50 17.921 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Acute EC50 2000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 25500 µg/l Marine water	Crustaceans - Artemia franciscana - Larvae	48 hours
	Acute LC50 42000 µg/l Fresh water	Fish - Oncorhynchus mykiss	4 days
	Chronic NOEC 4.995 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Chronic NOEC 0.375 ul/L Fresh water	Fish - Gambusia holbrooki -	12 weeks

12. Ecological information

Isopropyl alcohol	Acute LC50 1400000 µg/l Marine water Acute LC50 4200 mg/l Fresh water	Larvae Crustaceans - Crangon crangon Fish - Rasbora heteromorpha	48 hours 96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
clorofene	3.6	-	low
Ethyl alcohol	-0.35	-	low
Isopropyl alcohol	0.05	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information

14. Transport information

DOT Classification	UN1760	Corrosive liquids, n.o.s. (potassium hydroxide, 2,4-xylenol) RQ (potassium hydroxide, 2,4-xylenol)	8	II		**Reportable quantity** 25990.9 lbs / 11799.9 kg [3029.3 gal / 11467.3 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements. **Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: 1 L **Cargo aircraft** Quantity limitation: 30 L **Special provisions** B2, IB2, T11, TP2, TP27
TDG Classification	UN1760	CORROSIVE LIQUID, N.O.S. (potassium hydroxide, 2,4-xylenol)	8	II		**Explosive Limit and Limited Quantity Index** 1 **Passenger Carrying Road or Rail Index** 1 **Special provisions** 16
Mexico Classification	UN1760	LIQUIDO CORROSIVO, N.E.P. (potassium hydroxide, 2,4-xylenol)	8	II		**Special provisions** 274
IMDG Class	UN1760	CORROSIVE LIQUID, N.O.S. (potassium hydroxide, 2,4-xylenol)	8	II		**Emergency schedules (EmS)** F-A, S-B **Special provisions** 274

14. Transport information

IATA-DGR Class	UN1760	Corrosive liquid, n.o.s. (potassium hydroxide, 2,4-xylenol)	8	II		**Passenger and Cargo Aircraft** Quantity limitation: 1 L Packaging instructions: 851 **Cargo Aircraft Only** Quantity limitation: 30 L Packaging instructions: 855 **Limited Quantities - Passenger Aircraft** Quantity limitation: 0.5 L Packaging instructions: Y840 **Special provisions** A3, A803

PG* : Packing group

15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: 2-methylpropan-2-ol

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): Not determined.

Clean Water Act (CWA) 307: clorofene; 2,4-xylenol

Clean Water Act (CWA) 311: potassium hydroxide; sodium hydroxide; ammonia, anhydrous; xylenol; m-cresol; p-cresol

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Ammonia	< 0.01	Yes.	500	-	100	-

SARA 304 RQ : 100000000 lbs / 45400000 kg [11655404.4 gal / 44120505.3 L]

15. Regulatory information

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
clorofene	5 - 10	No.	No.	No.	Yes.	No.
potassium hydroxide	2.5 - 5	No.	No.	No.	Yes.	No.
Ethyl alcohol	1 - 2.5	Yes.	No.	No.	Yes.	No.
Isopropyl alcohol	1 - 2.5	Yes.	No.	No.	Yes.	No.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	clorofene Isopropyl alcohol	120-32-1 67-63-0	5.4998 1.8333
Supplier notification	clorofene Isopropyl alcohol	120-32-1 67-63-0	5.4998 1.8333

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: POTASSIUM HYDROXIDE; ISOPROPYL ALCOHOL; ETHYL ALCOHOL

New York : The following components are listed: Potassium hydroxide

New Jersey : The following components are listed: POTASSIUM HYDROXIDE; CAUSTIC POTASH; ISOPROPYL ALCOHOL; 2-PROPANOL; ETHYL ALCOHOL; ALCOHOL

Pennsylvania : The following components are listed: POTASSIUM HYDROXIDE (K(OH)); CHLORINATED PHENOLS; 2-PROPANOL; DENATURED ALCOHOL

Label elements

Signal word: : DANGER

Hazard statements : Harmful if swallowed.

Corrosive Causes irreversible eye damage

Corrosive CAUSES SKIN BURNS.

Precautionary measures : Keep out of reach of children.
Do not get in eyes, on skin, or on clothing.
Avoid breathing vapor or mist.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.
Remove contaminated clothing and wash it before reuse.

Avoid breathing dust/fume/gas/mist/vapors/spray.

16. Other information

Hazardous Material Information System (U.S.A.) :

Health	3
Flammability	2
Physical hazards	0
Personal protection	D

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Date of issue : 01/04/2015.

Date of previous issue : 09/04/2010.

Version : 3

16. Other information

Prepared by : Reckitt Benckiser LLC.
Product Safety Department
1 Philips Parkway
Montvale, New Jersey 07646-1810 USA.
FAX: 201-476-7770

Revision comments : Update as per US GHS.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

RB is a member of the CSPA Product Care Product Stewardship Program.

Lesson 4 Summary

In this lesson we have thoroughly discussed important facts about the Occupational Safety and Health Administration's Hazard Communication Standard . We have identified all key elements of Safety Data Sheets and how they apply to businesses. And lastly we reviewed an official manufacturer's Safety Data Sheet and. It is recommended that personal service workers, such as salon professionals, stay up to date on any changes or improvements made by OSHA or any other government entities regarding the topic of Federal workplace regulations.

Course Summary

We have now completed the course. In this review, we focused on many topics of the principles, practices and theories pertinent to being a licensed professional. We have discussed the science of Color Theory and Color Applications. We have also discussed the importance of Sanitation and Sterilization and OSHA Regulations. This knowledge is a necessary base for a solid foundation in the success of a professional career in the beauty industry. We applaud your continued interest in learning and your motivation to keep your professional license in good standing with the State Board. We invite you to participate in our course next renewal cycle.

References and Resources

Hair Color (8 hours) © ContinuingCosmetology.com;
Illustrations and images © ContinuingCosmetology.com

Centers for Disease Control and Prevention
https://www.cdc.gov/

U.S. Department of Health and Human Services
https://householdproducts.nlm.nih.gov/

U.S. Environmental Protection Agency
https://www.epa.gov/

United State Department of Labor
Occupational and Health Administration
https://www.osha.gov/

WebMD
https://www.webmd.com

dictionary.com

Google

Encyclopedia.com

"Parasites." UXL Encyclopedia of Science. . Encyclopedia.com. http://www.encyclopedia.com>.

"Lice Infestation." Gale Encyclopedia of Children's Health: Infancy through Adolescence. . Encyclopedia.com. <http://www.encyclopedia.com>.

Wikipedia
https://www.wikipedia.org/

Milady Standard Cosmetology, 13th Edition ©2016
ISBN-13: 9781285769417 Milady Publishing Company (2016). Clifton Park, NY: Cengage Learning.