

CHAPTER

# 13

# Skin Care Products: Chemistry, Ingredients, and Selection

## Chapter Outline

- Why Study Skin Care Products?
- Cosmetic Chemistry
- Product Safety
- Ingredients
- Aromatherapy
- Ingredients for Mature Skin
- Product Selection
- Home-Care Products
- Choosing a Product Line



# Learning Objectives

After completing this chapter, you will be able to:

- L01** Understand product components used in formulating products.
- L02** Understand FDA regulations regarding cosmetic claims and product safety.
- L03** Recognize the most common cosmetic ingredients and their benefits.
- L04** List and describe the main categories of professional skin care products.
- L05** Explain the basic products used in facials.
- L06** Understand product formulations for different skin types.
- L07** Explain the benefits of numerous skin care products.
- L08** Safely use a variety of salon products while providing client services.
- L09** Recommend home-care for different skin types and conditions.

# Key Terms

Page number indicates where in the chapter the term is used.

<b>alpha hydroxy acids (AHAs)</b> pg. 315	<b>azulene</b> pg. 326	<b>chelating agent</b> pg. 313	<b>DMAE (dimethylaminoethanol)</b> pg. 319
<b>alcohol (ethanol)</b> pg. 324	<b>benzyl peroxide</b> pg. 324	<b>chemical exfoliation</b> pg. 330	<b>echinacea</b> pg. 326
<b>algae</b> pg. 326	<b>beta hydroxy acids (BHAs)</b> pg. 315	<b>clay masks</b> pg. 338	<b>emollients</b> pg. 308
<b>allantoin</b> pg. 326	<b>beta-glucans</b> pg. 317	<b>cleansers</b> pg. 312	<b>emulsifiers</b> pg. 312
<b>aloe vera</b> pg. 326	<b>binders</b> pg. 320	<b>coenzyme Q10</b> pg. 319	<b>enzyme peels</b> pg. 326
<b>alpha lipoic acid</b> pg. 319	<b>botanicals</b> pg. 314	<b>colorants</b> pg. 314	<b>essential oils</b> pg. 313
<b>alum</b> pg. 324	<b>calendula</b> pg. 326	<b>comedogenicity</b> pg. 311	<b>exfoliants</b> pg. 315
<b>ampoules</b> pg. 340	<b>carbomers</b> pg. 313	<b>cosmeceuticals</b> pg. 308	<b>exfoliation</b> pg. 315
<b>anhydrous</b> pg. 308	<b>carrot</b> pg. 326	<b>cosmetics</b> pg. 307	<b>fatty acids</b> pg. 310
<b>aromatherapy</b> pg. 330	<b>certified colors</b> pg. 314	<b>delivery systems</b> pg. 316	<b>fatty alcohols</b> pg. 310
<b>astringents</b> pg. 334	<b>chamomile</b> pg. 326	<b>detergents</b> pg. 311	

# Key Terms

Page number indicates where in the chapter the term is used.

<b>fatty esters</b> pg. 310	<b>lakes</b> pg. 314	<b>paraffin wax masks</b> pg. 339	<b>sodium bicarbonate</b> pg. 325
<b>fragrances</b> pg. 313	<b>lanolin</b> pg. 324	<b>peptides</b> pg. 317	<b>sorbitol</b> pg. 325
<b>fresheners</b> pg. 334	<b>lavender</b> pg. 326	<b>performance ingredients</b> pg. 306	<b>sphingolipids</b> pg. 325
<b>functional ingredients</b> pg. 307	<b>licorice</b> pg. 327	<b>petroleum jelly</b> pg. 324	<b>squalane</b> pg. 325
<b>glycerin</b> pg. 324	<b>lipids</b> pg. 315	<b>pH adjusters</b> pg. 314	<b>squalene</b> pg. 325
<b>glycoproteins</b> pg. 317	<b>liposomes</b> pg. 316	<b>phytotherapy</b> pg. 330	<b>stem cells</b> pg. 317
<b>gommage (roll-off masks)</b> pg. 337	<b>lubricants</b> pg. 310	<b>polyglucans</b> pg. 317	<b>sulfur</b> pg. 325
<b>grapeseed extract</b> pg. 326	<b>mask (pack, masque)</b> pg. 337	<b>polymers</b> pg. 316	<b>sun protection factor (SPF)</b> pg. 319
<b>green tea</b> pg. 326	<b>mechanical exfoliation</b> pg. 335	<b>potassium hydroxide</b> pg. 324	<b>tea tree</b> pg. 327
<b>healing agents</b> pg. 314	<b>methylparaben</b> pg. 324	<b>preservatives</b> pg. 313	<b>tissue respiratory factor (TRF)</b> pg. 317
<b>herbs</b> pg. 324	<b>mineral oil</b> pg. 309	<b>propylene glycol</b> pg. 325	<b>titanium dioxide</b> pg. 325
<b>horsechestnut</b> pg. 326	<b>modelage masks (thermal masks)</b> pg. 339	<b>quaternium 15</b> pg. 325	<b>toners</b> pg. 334
<b>humectants</b> pg. 314	<b>moisturizers</b> pg. 341	<b>retinol</b> pg. 317	<b>urea</b> pg. 325
<b>hydrators</b> pg. 314	<b>noncertified colors</b> pg. 314	<b>rose</b> pg. 327	<b>vehicles</b> pg. 316
<b>hydrophilic agents</b> pg. 314	<b>oil soluble</b> pg. 312	<b>salicylic acid</b> pg. 325	<b>water soluble</b> pg. 312
<b>jojoba</b> pg. 326	<b>olfactory system</b> pg. 331	<b>seaweed</b> pg. 327	<b>witch hazel</b> pg. 327
<b>keratolytic</b> pg. 318	<b>papaya</b> pg. 327	<b>serums</b> pg. 340	<b>zinc oxide</b> pg. 325
<b>kojic acid</b> pg. 326	<b>parabens</b> pg. 324	<b>silicones</b> pg. 310	



▲ **Figure 13–1**  
Treatment products are the esthetician's most important tools.

The products an esthetician uses are the lifeblood of the facial treatment (**Figure 13–1**). The **performance ingredients** in products do the actual work of cleansing, normalizing, moisturizing, or otherwise treating the skin. Products come in many forms and types: solids, liquids, gases, or combinations of these. They may be formulated as cleansers, moisturizers, exfoliants, or other types of products. Within each category they are further differentiated by skin type.

In addition to understanding basic chemistry and cosmetic ingredients, estheticians need to know about new advanced ingredients and treatments, particularly those to which “antiaging” benefits are ascribed. While estheticians may not be allowed to claim the actual benefits of these products, you should understand them.

The cosmetics industry is continually developing new products to improve the appearance of the skin. Products used in treatments and for home-care can make a significant difference in the skin’s health and appearance. The effectiveness of skin care formulations has increased as our knowledge of skin biology expands. From phytotherapy (therapeutic benefits from plants) to clinical formulations, product ingredients are one of the most exciting subjects in skin care. The chemistry of ingredients can be studied at the molecular level, but product chemistry and biochemistry are complex subjects. This can be explored further when researching ingredients and the effects on the skin.

As an esthetician, you will need to know what a wide spectrum of skin care products do, how they work, and how they are used. You will need to make decisions about products that will best suit your client’s skin type and current condition. A person’s skin care needs can change depending upon the season or life’s activities. Be sure to check with clients to see if changes in their products are necessary. Educate them about the product or ingredient that is being used, what it does for them, and why it is effective.

Product ingredients are derived from a variety of sources including herbs, essential oils, plants, and synthetic performance ingredients. It’s important to be familiar with each ingredient in the product and know its potential side effects. Read the manufacturer’s literature and follow their instructions. This extensive chapter covers three main topics: chemistry, ingredients, and product selection.

## Why Study Skin Care Products: Chemistry, Ingredients, and Selection?

Estheticians should study and have a thorough understanding of skin care products in order to provide clients with the appropriate treatment and products for maintaining healthy, beautiful skin.

- As an esthetician, you will need to know what skin care ingredients and products do, how they work, and how they are used.
- The most important step in selecting products is determining which ingredients are best for an individual's needs and understanding product formulations for different skin types.
- In addition to understanding basic chemistry and cosmetic ingredients, you will need to stay current with new developments in cosmetic chemistry and advanced ingredients.
- Products used in treatments and for home-care have many benefits and can make a significant difference in the skin's health and appearance.
- Being aware of a client's allergies and the ingredients being used in products is very important to avoid problems or reactions to products.

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## Cosmetic Chemistry

The FDA views cosmetics according to the Cosmetic Act of 1938, which distinguishes between drugs and cosmetics. **Cosmetics** are defined by the FDA as: articles that are intended to be rubbed, poured, sprinkled or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance. In contrast, *drugs* are products (other than food) intended to affect the structures and/or functions of the body of humans or other animals. These definitions are important because they state that estheticians cannot make claims that a product or treatment can affect the structure or function of the skin. Estheticians focus on improving the skin's cosmetic appearance.

Every ingredient used in cosmetic chemistry has a function in the finished product. These ingredients are divided into two basic types: functional ingredients and performance ingredients. See **Table 13–1** and **Table 13–2** on pages 320 and 321, for a summary of some common functional and performance ingredients.

**Functional ingredients** make up the majority of a product; they allow products to spread, give them body and texture, and give them a specific form such as a lotion, cream, or gel. These ingredients do not affect the



## fyi

Some products and drugs are absorbed into the skin and the blood stream through the routes of penetration: skin cells, follicles, and glands.

appearance of the skin but are necessary to the product formulation. A preservative is an example of an inactive functional ingredient.

Performance ingredients cause the actual changes in the appearance of the skin. Examples include glycerin, which hydrates the skin's surface; alpha hydroxy acids (AHAs), which exfoliate the corneum; and lipids, which help patch the skin's barrier. Performance ingredients are sometimes referred to as active agents—or erroneously called *active ingredients*, which is an official term for use in the drug industry to indicate ingredients that chemically cause physiological changes.

A third category, **cosmeceuticals**, are products intended to improve the skin's health and appearance. Cosmeceuticals are stronger performance ingredients that may cause biochemical reactions and physiological effects to the skin. This category is not yet recognized by the FDA.

## Product Components

Ingredients can be derived from plants, vitamins, or animals. They are also synthesized from chemicals in a lab. The terms *natural* and *organic* are often used in referring to skin product ingredients, but these terms have no specific regulated definition. The FDA regulates USA food labels and certifications, but skin care product labels are not yet regulated for these terms. *Hypoallergenic* describes ingredients that may be less likely to cause allergic reactions. *Noncomedogenic* describes ingredients that will not clog pores or cause comedones.

Many of the terms used in relation to products used by estheticians are descriptive and are for consumer marketing purposes. Research or testing of products varies, and product chemistry is complicated, so it may be difficult to predict how a certain product will work for an individual. Some ingredients perform multiple roles in products and function as both a functional and performance ingredient.

## Water

Water makes up a large part of the skin. It is also the most frequently used cosmetic ingredient—it is both a vehicle and a performance ingredient. As a vehicle, it helps keep other cosmetic ingredients in solution and helps spread products across the skin. As a performance ingredient, water replenishes moisture in the surface of the skin. Almost all skin care products are a mixture of oil and water, or emulsions.

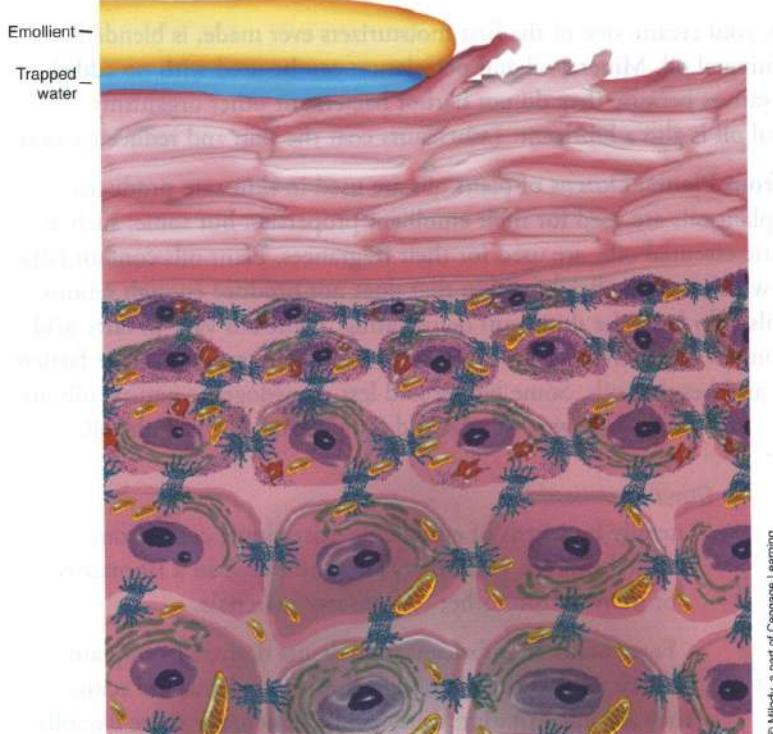
Products that do not contain any water are called **anhydrous** (an-HY-drus). These include oil-based serums, petrolatum-based products such as lip balm, and silicone serums (Figure 13–2). Anhydrous products are designed for dry skin.

## Emollients

**Emollients** are “fatty” materials (derived from oils or fats) used to lubricate and moisturize the skin. They can act as either vehicles or



▲ Figure 13–2  
Anhydrous products do not contain water.



◀ **Figure 13-3**  
Emollients trap moisture in the skin by the process of *occlusion*.

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performance ingredients. As vehicles, emollients help place, spread, and keep other substances on the skin. For instance, emollients in sunscreen help spread the sunscreen agents across the skin and hold them in place. Emollients in loose powder help the powder slip evenly across and adhere to the skin.

As performance ingredients, emollients lubricate the skin's surface and guard the barrier function. Emollients lie on top of the skin and prevent dehydration by trapping water and decreasing transepidermal water loss (TEWL). This moisturizing technique is called *occlusion* (Figure 13-3). Silicones and oils are both emollients.

### Oils

Many oils are used in skin care. They vary in density, fat content, and heaviness. They also vary in their tendency to cause comedones in oily or acne-prone skin. Different oils are appropriate for different degrees of dryness in the skin. Oils come from many sources.

**Oils from the Earth.** **Mineral oil** and petrolatum come from the earth, specifically from petroleum sources. Both emollients are time-tested, offer excellent protection against dehydration, and help prevent irritant skin contact. They are completely nonreactive and biologically inert, which means that they do not react with other chemicals involved in the skin's function. They can be combined with water and blended with an emulsifier into a cream, lotion, or fluid, which makes them much less oily.

## ACTIVITY

Did you know that you can easily and safely test the pH of a solution? pH test papers (litmus papers and pH papers) can be used to indicate the pH of any aqueous solution. You can test any skin care product. You will need pH test papers, several small open containers, bottled drinking water, stirring sticks, and some white towels. Place the product you want to test in a small open cup or bowl. If the product is a powder or is extremely thick, add a small amount of bottled water and stir thoroughly. Dip the test paper into the product. Immediately place the paper on a white towel, and compare the color obtained to the color chart on the package to determine the pH level. Test anything you can think of. Be creative! What you discover may surprise you.



Classic cold cream, one of the first moisturizers ever made, is blended with mineral oil. Mineral oil and petrolatum can be used with no added preservatives because they do not harbor bacteria or other organisms. Mineral oil is also a lubricant. **Lubricants** coat the skin and reduce friction.

**Oils from Plants.** Dozens of plant oils are used in skin care products. Most plant oils are used for their emollient properties, but some, such as aromatic essential oils, are used for their fragrances. Plant oils contain fatty acids, which are beneficial for skin that does not produce enough sebum. The oils help keep the skin from dehydrating. Plant oils vary in fatty acid content and heaviness. Coconut oil and palm oil are two of the fattiest and heaviest oils. Some lighter and less comedogenic natural oils are safflower, sunflower, canola, and jojoba (huh-HOH-buh) oil.

#### **Other Emollients**

Literally hundreds of emollients exist. Some come from natural sources, and others are synthesized in a laboratory or derived from other oils or fatty materials.

**Fatty acids** are lubricant ingredients derived from plant oils or animal fats. Although these ingredients are acids, they are not irritating. Fatty acids are actually more like oils. Common fatty acids that you will see are oleic acid, stearic acid, and caprylic acid.

**Fatty alcohols** are fatty acids that have been exposed to hydrogen. They are not drying; they have a wax-like consistency and are used as emollients or spreading agents. Examples of fatty alcohols are cetyl alcohol, lauryl alcohol, and stearyl alcohol.

**Fatty esters** are produced from combining fatty acids and fatty alcohols. Esters are easily recognized on labels because they almost always end in *-ate*, such as octyl palmitate. They often feel better than natural oils and lubricate more evenly. Frequently used fatty esters are isopropyl myristate, isopropyl palmitate, and glyceryl stearate.

**Silicones** are a group of oils that are chemically combined with silicon and oxygen and leave a noncomedogenic protective film on the surface of the skin. They also act as vehicles (for spreading) in some products, including makeup foundations. They are excellent protectants, helping to keep moisture trapped in the skin yet allowing oxygen in and out of the follicles. Silicones also add an elegant, non-greasy feel to products. Examples of silicones are dimethicone, cyclomethicone, and phenyl trimethicone. These ingredients are frequently used in sunscreens, foundations, and moisturizers.

#### **Emollients and Comedogenicity**

Many emollient ingredients such as oils and fatty acids can cause or worsen the development of comedones in the skin. These emollients are said to be comedogenic, which means they block pores.

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**Comedogenicity** (kahm-uh-do-jen-IS-suh-tee) is the tendency of any topical substance to cause or to worsen a buildup of dead cells in the follicle, leading to the development of a comedo (blackhead).

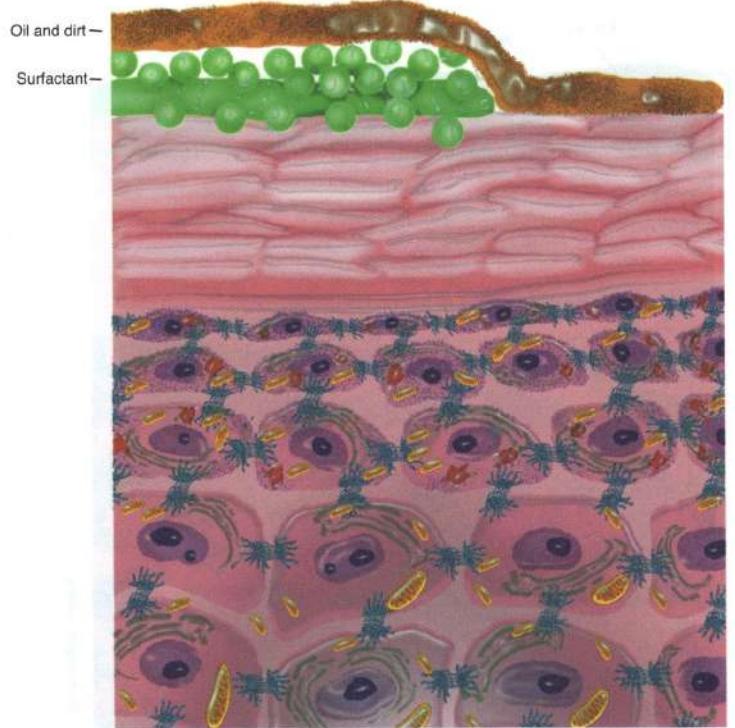
Emollients that are comedogenic are not intended for clog-prone or acne-prone skin. Oilier skin produces enough of its own emollient, as sebum, and thus does not need more. Dry skin that does not produce enough sebum may need heavier emollient ingredients to protect the skin from dehydration. This type of skin does not clog easily and is not acne prone. Not all emollients and oils are comedogenic. Common comedogenic ingredients are shown in **Table 13–7** on page 329.

## Surfactants

One of the biggest categories of cosmetic ingredients is **surfactants**. Surfactants reduce the surface tension between the skin and the product, and increase the spreadability of cosmetic products. Detergents and emulsifiers are surfactants.

### Detergents

The main types of surfactants used in skin-cleansing products are **detergents**. They reduce the surface tension of the dirt and oil on the skin's surface and form an emulsion to lift them from the skin (**Figure 13–4**). These are not the type of detergents you associate with washing clothes, but they are from the same chemical family. Detergents are used primarily in cleansing products.



◀ **Figure 13–4**  
Detergents reduce the surface tension of dirt and oils and lift them from the skin.

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They are also the agents that cause cleansers to foam. Detergents that are too strong can remove too much sebum and actually damage the lipid barrier function of the skin.

Some common detergent examples are sodium lauryl sulfate, sodium laureth sulfate (derived from coconut oil), and ammonium lauryl sulfate. There is scientific debate on the health concerns regarding sodium lauryl sulfate, but it can be a skin irritant. Do not confuse lauryl and laureth, as they are two very different things.

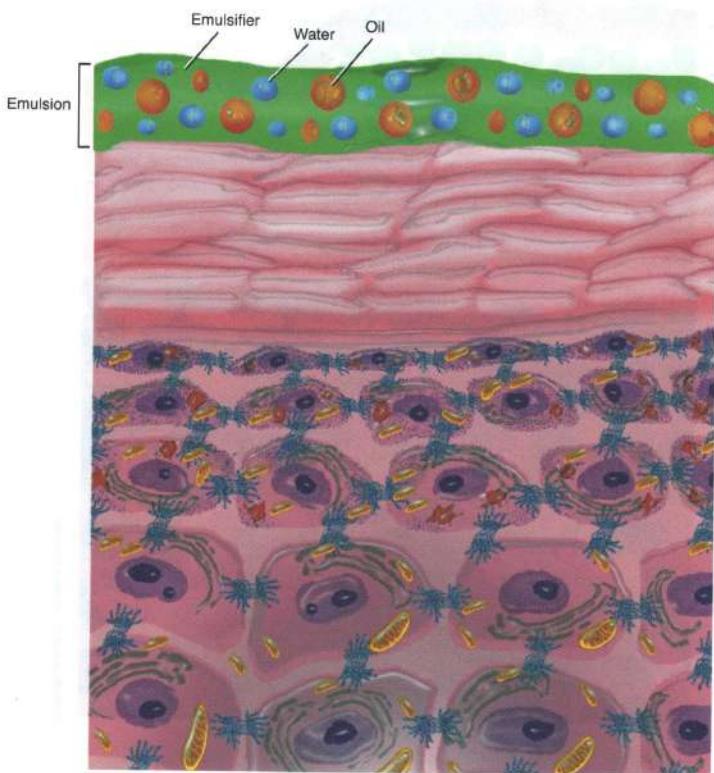
**Cleansers** are soaps and/or detergents that clean the skin. Soaps may be combined with detergents to make cleansers.

### Emulsifiers

Emulsifiers are another category of surfactants. In fact, some detergents can also act as emulsifiers. **Emulsifiers** are surfactants that cause oil and water to mix to form an emulsion. Without emulsifiers, oil and water would separate into layers. Emulsifiers surround oil particles, allowing them to remain evenly distributed throughout the water (**Figure 13–5**).

When skin care products are mixed, materials that are compatible with oil are mixed in with the oil. These substances are called **oil soluble**, and they are mixed into the oil phase of the product during manufacturing. Substances that are mixable with water are known as **water soluble** and are mixed in the water phase. Examples of emulsifiers are polysorbate and potassium cetyl sulfate.

► **Figure 13–5**  
In an emulsion, an emulsifier is added to the oil and water process.



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## Gellants and Thickeners

Gellants are agents that are used to give a product a gel-like consistency. Certain vehicle ingredients are added to thicken products or to help suspend ingredients that are hard to mix into a product. One example is **carbomers** (KAHR-boh-murz), which are used to thicken creams and are frequently used in gel products.

## Fragrances

People love wonderful scents, especially in products they associate with relaxation, such as bath oils and bath salts. **Fragrances** can come from plant, animal, or synthetic sources, but plant oils are especially popular. These perfumes give products their scent. Essential oils are often used for their natural fragrance.

Aromatherapy is the therapeutic use of plant aromas and essential oils for beauty and health treatment purposes. **Essential oils** are highly concentrated plant oils with properties that can have various effects on the skin. Essential oils are also used to relax, stimulate, or balance the psyche (Figure 13–6). Aromatherapy has been used medically for thousands of years, and it is still used today in treatments and products.

## Preservatives

Preservatives are an important functional ingredient in many skin care and cosmetic products. **Preservatives** prevent bacteria and other microorganisms from living in a product. Without preservatives, products could easily be contaminated with bacteria, fungi, molds, or other microorganisms that could cause disease in the person using the product. Examples of preservatives used in skin care products are chelating agents.

A **chelating agent** (CHE-layt-ing A-junt) is a chemical that is added to cosmetics to improve the efficiency of the preservative. Chelating agents work by breaking down the cell walls of bacteria and other microorganisms. Common chelating ingredients are disodium EDTA, trisodium EDTA, and tetrasodium EDTA. EDTA is an acronym for the chemical name *ethylene-diamine-tetra-acetic acid*. These ingredients are usually on the bottom of the ingredient list because they are used in small quantities. Parabens, quaternium (kwah-TAYR-nee-um) 15, and urea are all preservatives and some of these remain controversial due to their irritancy or other health concerns. There are debates on whether parabens accumulate in the body and disrupt hormones.

Besides fighting bacteria, preservatives help protect products from chemical changes that can adversely affect the product. **Antioxidants** are substances that inhibit oxidation reactions. They are used to help the condition of the skin by combating free radicals as well as stopping the oxidation that causes products to turn rancid and spoil. Common antioxidants used as preservatives are ascorbic acid, BHA, BHT and tocopherol.



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▲ Figure 13–6  
Essential oils are frequently used in skin care products.

### FOCUS ON

#### Aromatherapy

Essential oils are the fragrant soul of the plant.



## Color Agents

Color agents serve several purposes. In skin care products, they add color, which mainly enhances a product's visual appeal. In color cosmetics, of course, the color agents are responsible for most of the product's cosmetic effects. They give color to products such as eye shadows, lipsticks, and foundations. **Colorants** are vegetable, pigment, or mineral dyes that give products color.

The FDA closely regulates color agent ingredients. There are two types of color ingredients: certified colors and noncertified colors.

**Certified colors** are synthetic, inorganic, and are known as metal salts. These are colorants that have been batch certified and approved by the FDA.

**Noncertified colors** are organic (carbon-based) compounds from animal or plants extracts and can also be natural mineral pigments. Noncertified colors are less irritating than certified colors, making them more useful for cosmetics applied to the eye area, for example. They are listed on ingredient labels as "D&C," which stands for *drug & cosmetic* or "FD&C," which stands for *food, drug, & cosmetic*.

**Lakes** are insoluble pigments made by combining a dye with an inorganic material and are commonly used in colorful cosmetics. These colorants can be blended to produce many different colors for skin care products and makeup.

**Exempt colors**, those that do not require certification, include zinc oxide, iron oxides, carmine, mica, and the ultramarine colors. They are less intense in color than certified colors. Nonetheless, zinc oxide and iron oxide help with opacity, meaning that they provide a solid color that is not transparent. They are used extensively in coverage makeup products such as foundations.

## Other Product Components

**pH adjustors**—Substances called pH adjustors are acids or alkalis (bases) used to adjust the pH of products. Buffering ingredients stabilize products and prevent changes in pH. Sodium hydroxide and citric acid are often used as pH adjustors. These are functional ingredients.

**Solvents**—These are substances, such as water or alcohol, that dissolve other ingredients. These are functional ingredients.

**Botanicals**—Ingredients derived from plants. Performance ingredients used in phytotherapy are derived from plants and have many functions.

**Healing agents**—These are substances such as chamomile, licorice, azulene, and aloe that heal the skin. These are performance ingredients.

## Hydrators and Moisturizers

**Hydrators**, **humectants** (hyoo-MEK-tents), and **hydrophilic agents** are ingredients that attract water to the skin's surface. They can lock water on the skin, reducing dehydration. Many humectants are available including glycerin,

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sodium PCA, sorbitol, seaweed extracts, algae (AL-jee) extract, hyaluronic acid (HY-uh-lur-AHN-ik A-sid), and propylene glycol.

Most moisturizing products are combinations of emollients and humectants. Thousands of possible combinations exist. These combinations determine the differences between moisturizers, creams, lotions, and fluids. Thicker creams have more emollients than lotions or fluids.

### Lipids

**Lipids** are used to improve hydration, plumpness, and smoothness of the skin. They can also reduce sensitivity by making the skin more resistant to irritants and dehydration. Common lipid ingredients are sphingolipids, phospholipids, and glycosphingolipids. These ceramides (a family of lipid molecules), also found naturally in the intercellular matrix, are all known to improve the barrier function of the skin.

## Exfoliating Ingredients

**Exfoliation** (eks-foh-lee-AY-shun), or the removal of dead corneum cells on the epidermis, improves the skin's appearance. **Exfoliants** are mechanical and chemical ingredients that exfoliate the skin. Mechanical exfoliating ingredients are added to products to physically scrape dead cells from the skin's surface. The ingredients include polyethylene and jojoba beads, ground nuts such as almonds, and various seeds.

Exfoliation can also be achieved through chemical action

(Figure 13–7). **Alpha hydroxy acids (AHAs)** and **beta hydroxy acids (BHAs)** are naturally occurring mild acids used as chemical exfoliants. Glycolic, lactic, malic, citric, and tartaric are AHA's. Salicylic (sal-uh-SIL-ik) acid is a BHA, which is not as strong as an AHA. Citric acid was originally cited as a BHA, but is now considered a mild AHA. This has to do with the chemical composition of the acids.

These exfoliants work by loosening the bond between cells in the epidermis. They can also help to lighten pigmented areas, soften rough skin, and heal areas that are prone to breakouts. Any of these exfoliants can be added to other products. Acids come in a variety of concentrations and pH levels that affect the potency and irritancy of a given product. A product with the same concentration of hydroxy acid is more irritating at a lower pH. A concentration of 10 percent or less and a pH of 3.5 or greater is recommended for over-the-counter products and home use. Sun protection is necessary when using chemical exfoliants.

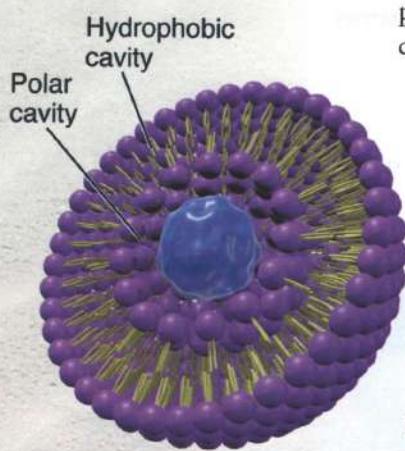
### Enzymes

Enzymes such as papain, bromelain, and pancreatin (pan-cre-a-tin) are also used in exfoliating products. These ingredients are designed to dissolve keratin proteins on the surface of the skin to make it softer, smoother, and help maintain the hydration level of the epidermis. Once the dead skin cells are gently removed, the skin is clearer and can absorb products more easily. This is true for all types of exfoliants.



▲ Figure 13–7  
Applying an AHA product.

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**▲ Figure 13–8**  
Liposomes can encapsulate and transport water-soluble ingredients in their polar cavity and oil-soluble ingredients in their hydrophobic cavity.

## Lighteners and Brighteners

Lighteners and brighteners are ingredients that are used in the bleaching or lightening of the skin, actually “lifting” a darker pigmented area to a lighter color. Commonly used ingredients are hydroquinone, kojic acid, arbutin, vitamin C, licorice root, bearberry, green tea extract, and alpha hydroxy and beta hydroxy acids. These ingredients work either by bleaching the upper layers of the epidermis or by slowing down the pigment factories in the skin, known as melanocytes, thus blocking the production of melanin. These ingredients are also known as tyrosinase inhibitors. *Tyrosinase* (TY-ruh-sin-ays) is the enzyme that converts tyrosine, an amino acid, into melanin. When using these products, it is important for clients to wear sunscreen to protect the skin and to prevent the pigmented areas from returning. Hydroquinone is another controversial ingredient due to health concerns.

## Delivery Systems

**Delivery systems** are chemical systems that deliver ingredients to specific areas of the epidermis. Vehicles, liposomes, and polymers are three types of delivery systems.

**Vehicles** are spreading agents and carrying bases necessary to the formulation of a cosmetic. Water and emollients are both vehicles. Vehicles carry or deliver other ingredients into the skin and make them more effective.

**Liposomes** (LY-puh-zohms) are closed lipid bilayer spheres that encapsulate ingredients, target their delivery to specific areas of the skin, and control their release (**Figure 13–8**). The bilayer structure of liposomes mimics cell membranes and is therefore compatible with cells—in contrast to standard *micelle* emulsions, which disrupt and damage cell membranes in the delivery process.

**Polymers** (PAHL-uh-murs) are chemical compounds formed by a number of small molecules. One use of polymers is in delivery systems. They are used as advanced vehicles that release substances onto the skin's surface at a microscopically controlled rate. They are also referred to as microsponges.

## Performance Ingredients That Improve Cell Metabolism

A major goal of advanced skin care treatments is to help the skin function at its maximum capacity at any age. Improvements in cell turnover that emulates younger skin together with nutrients to facilitate this process can slow the appearance of aging. While it is impossible to reverse major damage, a well-planned skin care program can reduce the signs of aging. A number of high-tech ingredients serve as antioxidants and actually stimulate metabolic processes. Many of these ingredients are found naturally in the body and are designed to be compatible

with natural cellular functions. Other high-tech ingredients are also briefly discussed here.

**Polyglucans** (PAHL-ee-glue-kans) and **beta-glucans** (BAY-tuh GLUE-kans) are used to enhance the skin's defense mechanism and stimulate cell metabolism. They are normally derived from yeast cells and have a natural affinity for the skin. A polyglucan is hydrophilic, absorbing more than 10 times its weight in water. Polyglucans also help preserve hydration, collagen, and elastin by forming a protective film on the skin. Beta-glucans help reduce the appearance of fine lines and wrinkles by stimulating the formation of collagen.

**Tissue respiratory factor (TRF)** is also derived from yeast cells. TRF functions as an anti-inflammatory and moisturizing ingredient.

**Stem cells** are being derived from plants to protect or stimulate our own skin stem cells. This is for health and antiaging benefits. Stem cell ingredients derived from grapes and apples may help protect the stem cells in the skin. There will be many developments in this research science in the years to come.

**Epidermal Growth Factor (EGF)** stimulates cell division and is used for healing wounds or burns. Skin contains its own natural EGF. The research on these and other ingredients continues to advance rapidly.

## Peptides

**Peptides** are chains of amino acids used in skin care products to produce changes in the skin's appearance. Peptides have been shown to help aging skin by improving tissue repair and skin functions such as cell and fibroblast activity. Collagen, elasticity, and skin firmness are all considered to be enhanced by peptides. Two of the more common peptide ingredients are palmitoyl pentapeptide-3 and palmitoyl oligopeptide. Copper peptides are another effective formulation. Peptides are less irritating than some of the other ingredients for aging skin, and they are often used along with other ingredients such as hydrators and antioxidants.

**Glycoproteins** (gly-koh-PRO-teens), also called glycopolypeptides, another yeast cell derivative, have been found to enhance immune response and cellular metabolism, which boosts oxygen uptake in the cell. This revitalizing capacity strengthens the skin's natural ability to protect itself against damaging environmental influences. Glycoproteins are skin conditioning agents derived from carbohydrates and proteins. These are especially beneficial to skin that appears unhealthy, is dull from smoking, has diffused redness, or has environmental damage.

## Retinol and Retinoic Acid (Retin-A®)

A natural form of vitamin A, **retinol** (RET-in-all) stimulates cell repair and helps to normalize skin cells by generating new cells. It has been used in serums, creams, and lotions and varies in concentration when used either as a cosmetic or a drug. As with many cosmetic ingredients, more than a trace amount is necessary





to be effective, but high concentrations of vitamin A can be irritating to sensitive skin. Vitamin A is an antioxidant and has exfoliating properties.

Retinoic acid (Retin-A®, Renova®, Tazorac®) is also a form of vitamin A approved as an active drug ingredient. It is of the **keratolytic** (kair-uh-tuh-LIT-ik) group, meaning that it causes sloughing, or exfoliating, of skin cells. It is used for skin problems such as acne, sun-damaged skin, and wrinkles. Because many people have moderate to severe reactions to retinoic acid, a physician must be treating anyone using retinoids.

## Vitamins and Other Antioxidants

Antiaging products and treatments are a main focus of the skin care industry. Antioxidants are one of the most effective treatments for the skin.

*Antioxidants* are vitamins, amino acids, and other natural substances that neutralize the damaging effects of free radicals and help skin cope with the damaging effects of environmental influences. Aging or sun-damaged skin needs antioxidants both topically and orally.

Antioxidants, applied topically, neutralize free radicals before they can attach themselves to cell membranes and destroy the cells. These are also added to cosmetic formulations to prevent the oxidation that causes a product to turn rancid and spoil.

Antioxidants play a vital role in maintaining the quality, integrity, and safety of cosmetic products. Typical cosmetic antioxidants include reducing agents and free radical scavengers.

Vitamins A, C, and E have been used in skin care products as antioxidants for many years. It is believed that they work by interfering with inflammation, thus reducing the production of enzymes that injure and destroy skin cells. Other antioxidants include alphalipoic acid, idebenone, stearyl glycyrrhizinate, green tea, and grapeseed. When used in combinations, these formulas are called broad-spectrum antioxidants that give a greater range of protection.

Antioxidants can help prevent wrinkles, promote skin healing, and reduce the formation of scar tissue (presurgical and postsurgical). Vitamins A and E (fat soluble) protect the phospholipid structure of the cell membrane. Vitamin C (water soluble) guards the inside of cells and DNA.

## Free Radicals

Antioxidants are included in many skin care formulas designed to combat free radicals. *Free radicals* are aggressive, unstable, oxygen-containing molecules. They have lost an electron and need to steal other electrons from other molecules, thereby damaging the cells they steal from.

Free radicals are *super oxidizers* that not only cause an oxidation reaction but also produce a new free radical in the process. Normal oxidation deactivates the oxidizer and stops the reaction from continuing, but the oxidation reaction caused by free radicals continues in a chain reaction that can go on forever. One free radical can oxidize millions of other compounds.

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Free radicals damage cell membranes and normal cellular metabolism systems. They can also damage DNA and RNA, and they contribute to the hardening of collagen and elastin cells. This all leads to premature aging and increases skin sensitivity, irritation, age spots, and dryness.

### **Antioxidant Ingredients**

Here are some of the most widely used antioxidants:

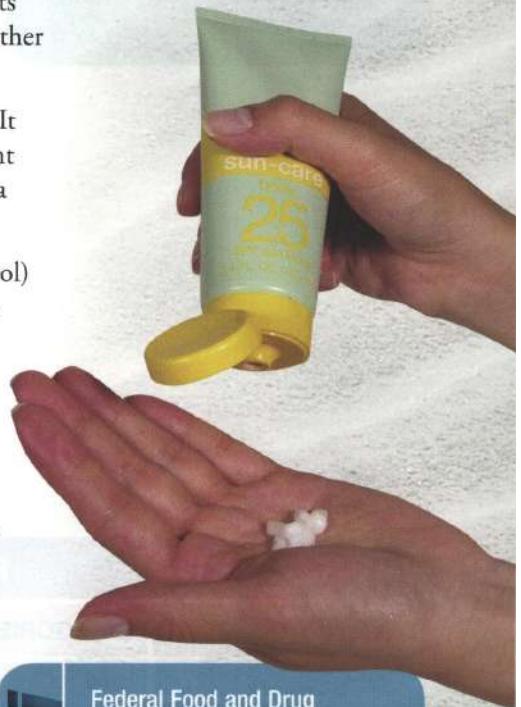
- **Vitamin C** (L-ascorbic acid) is a water-soluble antioxidant. It strengthens the white blood cells and immune system and is essential for producing collagen.
- **Ester Vitamin C**, also called *Ester C*, is joined by a chemical ester bond with a fatty acid derived from palm oil (palmitic acid). It is oil-soluble and is absorbed into the skin much more easily than water-soluble ingredients are. It is highly stable and maintains its effectiveness when mixed with other ingredients. Vitamin C ester stimulates fibroblasts and cell metabolism.
- **Alpha lipoic acid** is a natural molecule found in every cell in the body. It is a powerful antioxidant and is soluble in water and oil. This antioxidant increases cellular metabolism and the effects of other antioxidants. Alpha lipoic acid is also anti-inflammatory and reduces redness.
- **DMAE (dimethylaminoethanol)** (dy-meth-il-uh-MEEN-noh-eth-uh-nol) is an antioxidant that stabilizes cell membranes. It also boosts the effects of other antioxidants. DMAE increases chemicals that control muscle tone, thus improving the appearance of sagging skin.
- **Coenzyme Q10** is considered a powerful antioxidant that protects and revitalizes skin cells. It is often formulated with other natural protective ingredients to strengthen the capillary network and increase energy to epidermal cells. It seems to fortify the skin's immune function and activate metabolic functions. Use of CoQ10 often results in visible reduction of wrinkles and fine lines.

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### **Sunscreen Ingredients**

There are two types of active sunscreen ingredients. Chemical sunscreens are organic (carbon based) compounds that chemically absorb ultraviolet radiation. Physical sunscreens are inorganic (without carbon) compounds that physically reflect or scatter ultraviolet radiation. The **sun protection factor (SPF)** of ingredients is the ability of a product to delay sun-induced erythema, the visible sign of sun damage. SPF is based on the UVB protection, not the UVA protection. This is why the UVA exposure can be greater when using sunscreens. The estimated SPF is not just based on the exposure time, but also on the sun's intensity, skin type, product application, and other factors.

The reactions of chemicals and additives in sunscreen formulas are complex. The photostability of products exposed to UV radiation and the potential photoallergic reactions from using sunscreen in susceptible individuals are considerations in product choices. Fragrances and preservatives in sunscreens can also cause skin allergies and irritation.



**fyi**

Federal Food and Drug Administration regulations do not allow the term *sunblock* to be used in products, because no product can block 100 percent of UVA and UVB radiation.

## FOCUS ON

### Chemistry

PEG is the acronym for *polyethylene glycol*. PEGs are blended into many formulations as solvents, **binders** (substances such as glycerin that bind, or hold, products together), vehicles, humectants, and bases for enhanced results. The number listed with the name (PEG-4, PEG-75) is the weight of the molecular chain as measured in moles.

Examples of *organic* chemical sunscreens are:

- Octinoxate (octyl methoxycinnamate)
- Octisalate (octyl salicylate)
- Oxybenzone (benzophenone)

Examples of *inorganic* physical sunscreens are:

- Titanium dioxide
- Zinc oxide

### Natural versus Synthetic Ingredients

A combination of both natural and synthetic ingredients is one of the best chemical formulations. Natural products directly from nature can have powerful skin benefits; however, some of the most effective cosmetic ingredients are not derived from plants. Synthetically produced ingredients can be just as effective and may have certain advantages over ingredients derived naturally from plants.

Natural and synthetic ingredients can both have drawbacks. Natural ingredients may cause allergies in people who are sensitive, while synthetic versions of the same ingredients may not. Certain synthetic ingredients are effective cell renewal stimulants. It should be remembered, though, that synthetic ingredients may have unhealthy chemicals and do not harness the real essence or purity of plants or oils.

Many manufacturers are combining natural ingredients and synthetic ingredients to obtain the best of both worlds. Clients will prefer one

▼ Table 13-1  
Functional Ingredients.

### FUNCTIONAL INGREDIENTS

COMPONENTS	CATEGORIES OF INGREDIENTS	EXAMPLES OF INGREDIENTS
Water	liquid	water
Emollients	oils, fatty acids, fatty alcohols, fatty esters, silicones	jojoba oil, olive oil, sesame, mineral oil
Surfactants	detergents, emulsifiers	laurel PCA, decyl polyglucose, polysorbate, sodium cocoate, sodium lauryl sulfate, TEA (triethanolamine)
Gellants/Thickeners	carbomers (polymers)	carbomer 934, carboxymethyl cellulose (cellulose gum), xanthan gum (cornstarch gum)
pH Adjusters	buffers	citric acid, sodium bicarbonate
Color Agents	certified, noncertified, exempt, lakes	D&C organic, zinc oxide, mica, mineral dyes, metal salts, inorganic (iron oxide)
Preservatives	antioxidants, antimicrobial, chelating agents	ascorbyl palmitate, imidazolidinyl urea, BHT, BHA, EDTA, parabens, urea
Fragrances	natural, synthetic	lavender, essential oils
Solvents	alcohol, water	isopropyl alcohol, butylene glycol
Delivery Systems	vehicles, liposomes, polymers	cyclomethicone (silicone)

◀ Table 13–2  
Performance Ingredients.

PERFORMANCE INGREDIENTS	
COMPONENTS	EXAMPLES OF INGREDIENTS
Antioxidants	vitamins A, C, and E, green tea (polyphenols), idebenone, coenzyme Q10 (ubiquinone)
Botanicals	plants, herbs
Brighteners	licorice root, kojic acid, vitamin C, mulberry extract
Chemical Exfoliants	AHA's, BHA's
Enzymes	papain (papaya), bromelain (pineapple), pumpkin
Healing Agents	licorice, aloe, chamomile
Hydrators	humectants (glycerin), hyaluronic acid, polyglucans, sodium PCA, sorbitol
Lipids	phospholipids, ceramides, sterols
Peptides	palmitoyl pentapeptide 4, palmitoyl oligopeptide

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philosophy over the other and will be attracted to either natural or more clinical products. Knowing the benefits of both is important for estheticians and for those selling products.

Sometimes it can be difficult to know when to choose natural ingredients or synthetic ones—both make tremendous contributions to skin care formulations.

Manufacturers do extensive research and development to bring the latest technologies into cosmetic formulations. For example, hyaluronic acid, an ingredient used to bind moisture, was initially derived from roosters' combs. Synthetic production of this ingredient was developed, and today it is derived from synthetic sources for use in cosmetics. The synthetic version is more stable and has more effective water-binding properties.

To make informed choices, estheticians must stay current with developments in cosmetic chemistry. Combining both natural and synthetic ingredients is effective in product formulations. The quality and the sources of ingredients are both important factors to consider when choosing products.

### Organic Ingredients

Organic ingredients are intended to be natural products that are grown without the use of pesticides or chemicals. Ideally, they are harvested and manufactured in a more natural way. Unfortunately there is no organic labeling standard for cosmetics in the United States at this time.

The USDA may certify organic products that meet the standards through the National Organic Program as applied to agricultural products. The content of organically produced ingredients must be



### CAUTION!

If a client has an allergic reaction to a product that requires medical treatment, the manufacturer of the product is responsible—unless the product was purchased in bulk, repackaged by the salon in smaller containers, and resold, in which case the salon is at fault. If the product is made in the salon, the salon is also responsible. Malpractice insurance does not generally cover products formulated or repackaged in the salon.



at least 95 percent, excluding water and salt. There is International Labeling and other third-party certifications for organic products as well. The Natural Products Association has a self-regulating Natural Standard, and NSF/ANSI 305 was adopted as an American National Standard. These standards continue to expand.

It is difficult to formulate products without preservatives and other functional ingredients to stabilize the product. Additionally, most products are 60 to 90 percent water, so the product may be labeled organic by the water alone. Marketing statements do not always tell the whole story. False claims are common in the billion-dollar skin care industry.

On a positive note, green chemistry is becoming more common with manufacturers that are improving their processing to reduce their effects on the environment. Many ingredients such as herbs, fruits, and oils are grown organically. Society is more aware of environmental effects on the planet and the health benefits of using more “organic” products.

Products that are considered “green” are more sustainable, which generally means they are not as harmful to the environment due to practices such as the ingredients used, the manufacturing processes, or the resources that are conserved.

Scientific research is expanding the knowledge of how chemicals and ingredients affect our health. Organic ingredients are becoming more popular as consumer demand increases. New organic product lines are flourishing. Technological advances have also made it easier to blend effective skin care products from organic and natural sources.  L01

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## Product Safety

The FDA does not require approval of cosmetics before their manufacture and sale. The FDA does require that all drugs be proven safe and effective before their manufacture and sale. The FDA regulates cosmetics only in the areas of safety, labeling, and the claims made for a product. If a cosmetic product makes a drug claim, is not properly labeled, or has been reported as unsafe, the FDA can take legal action against the manufacturer. Drugs may claim to change a function of the body. Cosmetics may claim only to change the appearance of the body.

FDA regulations for cosmetic labeling state that cosmetic companies must list the company's name, location, or distribution point as well as all the ingredients in the product. This allows consumers to check for ingredients they may be allergic to. Ingredients must be listed in descending order of predominance, starting with the ingredient having the highest concentration and ending with the ingredient having the lowest concentration. Ingredients with a concentration of less than 1 percent may be listed in any order. A fragrance must be listed as “fragrance,” but the ingredients need not be listed.

## Allergic Reactions

Many ingredients used in skin care products—including fragrances, essential oils, and preservatives—may cause adverse skin reactions. Being aware of a client's allergies and the ingredients being used in treatments is very important to avoid problems or reactions. Sometimes a product or treatment will cause a reaction. If the skin becomes excessively red or the client complains of burning, immediately remove the product and rinse the skin with cold water. Having a cortisone cream available and products to calm skin reactions is a recommended precaution.

Fragrances and some preservatives are among the most common allergens. Allergic reactions may not be detected until several days later. Symptoms may include inflammation of the skin, burning or itching, blisters, blotches, or rashes. The eyes may swell, puff, or produce tears.

The best way to guard against allergic reactions is to pretest a small quantity of the product with a test patch (**Figure 13–9**). Before the treatment, conduct a patch test on clients with reactive skin. Try the product on the inside of the arm, near the elbow, or on a small area of the face.

If there is any reaction within 24 hours, the product should not be used. If the reaction is serious, the product should be taken to a physician who can determine what has caused the problem and then treat the condition appropriately. The manufacturer of the product should be notified immediately.

Always follow strict cleaning procedures in treatment areas and elsewhere in the salon. Products must be kept clean and stored properly. Close containers when not in use. Do not share cosmetics with anyone else. Never use saliva to moisten eye makeup or other cosmetics; use only fresh, clean water. Discard outdated, rancid, or stale products. Products stored in dark containers and in cooler temperatures will last longer. **✓ L02**

## Ingredients

Choosing products that are effective for a person's individual needs is the most important part of any treatment and home-care regime. Results are more noticeable when products are used correctly. The next section in this chapter includes a partial list of ingredients used in skin care and beauty products. Their definitions and properties are included in **Tables 13–3** through **13–7** on the following pages.

Many products are made synthetically rather than from plants or animal products. It is important to know the source of the ingredient, particularly if clients have a preference for one type over another. The source of the ingredient and the manufacturing process determine the quality and effectiveness of the product.



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Photography by Rob Werling.

▲ **Figure 13–9**  
A patch test is the best way to determine if a client is allergic to a product.

## FOCUS ON

### Controversial Ingredients

Controversial ingredients used in products include sodium lauryl sulfate; parabens and other preservatives; color agents; nanoparticles; and phthalates (plasticizers). Accutane and hydroquinone are also controversial. Scientific research and testing continues to determine potential side effects from using certain chemicals. Some concerns are valid, while others are not yet proven. There are many rumors and incorrect information is prevalent on the Internet. Estheticians and consumers need to research and verify facts from reliable sources to determine what the real concerns are.

## COMMON PRODUCT COMPONENTS AND INGREDIENTS (Natural and Synthetic)

INGREDIENT	DESCRIPTION
AHAs/BHAs	Chemical exfoliators. Glycolic, lactic, malic, citric, and tartaric are AHA's. Salicylic, a BHA, is not as strong. These exfoliants work by loosening the bond between cells in the epidermis.
Alcohol	Used as an antiseptic and solvent in perfumes, lotions, and astringents. There are many types of alcohols; not all are drying.
Alum	A compound made of aluminum, potassium, or ammonium sulfate. An astringent, antiseptic, and stimulating. Good for oily skin; also stops bleeding.
Benzyl Peroxide	A drying ingredient with antibacterial properties commonly used for blemishes and acne. It can be a skin allergen and irritant.
Ceramides	A family of lipid materials found in skin's intercellular matrix; a natural moisturizing factor; products help lipid replacement and combat dryness, aging, and dehydration.
Collagen	Protein derived from animals or synthetically manufactured. Plumps the surface of the skin and prevents water loss.
Essential Oils	Oils derived from plants and herbs; they have many different properties and effects on the skin and psyche.
Glycerin	Formed by a decomposition of oils or fats, glycerin is an excellent skin softener and humectant as well as a very strong water binder.
Herbs	These, along with plant extracts, contain phytohormones. Hundreds of different herbs are used in skin care products and cosmetics to help heal, stimulate, soothe, and moisturize. Herbs are also used as astringents.
Hyaluronic Acid	A hydrophilic agent with excellent water-binding properties.
Lanolin	An emollient with moisturizing properties, lanolin is a sheep's wool derivative formed by a secretion of the sheep's sebaceous glands.
Lipids	Fat or fat-like substances; improves hydration and the barrier function of the skin.
Liposomes	Closed-lipid bilayer spheres that encapsulate ingredients, targeting their delivery to specific tissues of the skin, and controlling their release.
Methylparaben	One of the most frequently used preservatives because of its very low sensitizing potential; one of the oldest preservatives in use to combat bacteria and molds. It is noncomedogenic. May be an irritant. See parabens.
Mineral Oil	An emollient and lubricant; mineral oil is a clear, odorless substance derived from petroleum.
Mucopolysaccharides	Made of carbohydrate-lipid complexes; good water binders.
Parabens	One of the most commonly used groups of preservatives in the cosmetic, pharmaceutical, and food industries, parabens provide antibacterial and antifungal activity against a diverse number of organisms. There are health debates on parabens as to whether they accumulate in the body and disrupt hormones.
Peptides	Chains of amino acids that stimulate fibroblasts, cell metabolism, and improve skin's firmness. Larger chains are called polypeptides.
Petroleum Jelly	An occlusive agent that protects the barrier layer by holding in water. It is used after laser surgery to protect the skin as it heals.
Potassium Hydroxide	A strong alkali used in soaps and creams.

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▲ Table 13-3  
Common Product Components and Ingredients.

*continued*

## COMMON PRODUCT COMPONENTS AND INGREDIENTS (Natural and Synthetic)

INGREDIENT	DESCRIPTION
Propylene Glycol	A humectant often used in dry or sensitive skin moisturizers.
Quaternium 15	An all-purpose preservative active against bacteria, mold, and yeast, this ingredient is probably the greatest formaldehyde-releaser among cosmetic preservatives; may cause dermatitis and allergies.
Retinoic Acid	A vitamin A derivative, retinoic acid has demonstrated an ability to alter collagen synthesis. It is used to treat acne and visible signs of aging. Side effects are irritation, photosensitivity, skin dryness, redness, and peeling.
Salicylic Acid	A beta hydroxy acid with exfoliating and antiseptic properties, its natural sources include sweet birch, willow bark, and wintergreen. Check for client allergies to this acid and to aspirin.
Silicone	Oil that is chemically combined with silicon and oxygen and leaves a noncomedogenic, protective film on the surface of the skin.
Sodium bicarbonate	Baking soda; an inorganic salt used as a buffering agent, neutralizer, and a pH adjuster.
Sorbitol	A humectant that absorbs moisture from the air to prevent skin dryness. In dry climates, if the skin's moisture content is greater than the atmosphere, humectants such as sorbitol will draw moisture out of the skin. It is obtained from the leaves and berries of mountain ash. It also occurs in other berries, cherries, plums, pears, apples, seaweed, and algae.
Sphingolipids	A ceramide; lipid materials that are a natural part of the intercellular matrix. Glycosphingolipids and phospholipids are also natural lipids found in the barrier layer.
Squalane	Derived from olives, squalane is an emollient, desensitizing agent, and nourishing.
Squalene	Originally from shark-liver oil, squalene occurs in small amounts in olive oil, wheat germ oil, and rice bran oil. It is also found in human sebum. Insoluble in water, it is a lubricant and perfume fixative.
Sulfur	Sulfur reduces oil-gland activity and dissolves the skin's surface layer of dry, dead cells. This ingredient is commonly used in acne products. It can cause allergic skin reactions in some sensitive people and those allergic to sulfur or sulfates.
Titanium Dioxide	An inorganic sunscreen that reflects UVA and UVB. When applied, it remains on the skin surface, basically scattering the UV radiation. Used in sunscreen, makeup bases, and daytime moisturizers; also used to give cosmetics a white color.
Urea	Properties of urea include enhancing the penetration abilities of other substances. It is anti-inflammatory and an antiseptic; its deodorizing action protects the skin's surface and helps maintain healthy skin.
Vitamins	Vitamins are organic compounds and essential nutrients. Vitamins A, C, E, and K are beneficial to the skin for many reasons.
Zinc Oxide	An inorganic sunscreen that reflects UVB and UVA. Also used to protect, soothe, and heal the skin. Zinc oxide is somewhat astringent, antiseptic, and antibacterial. It is obtained from zinc ore and is nonallergenic.

▲ Table 13–3 (continued)

## INGREDIENTS FROM NATURE

Some of the following natural ingredients are derived from plants (phytotherapy), and some are also produced synthetically.

INGREDIENT	DESCRIPTION	PRIMARY BENEFITS
Algae	Derived from seaweed; contains minerals	Moisturizing, nourishing
Allantoin	Derived from the comfrey plant or uric acid; used in soothing products	Healing, promotes healthy tissue growth
Almond meal	Ground almonds; commonly used in scrubs	Soothing and exfoliating
Aloe vera	A versatile plant used in many products	Healing, soothing, hydrating, anti-inflammatory
Arnica	Healing; great for sore muscles, bruising	Anti-inflammatory
Avocado	An emollient; contains vitamins A and C	Moisturizing, soothing
Azulene	Derived from the chamomile plant; used for sensitive skin and calming	Anti-inflammatory, soothing
Bayberry	Root bark; good for oily skin	Antiseptic, astringent
Birch leaf	Good for oily skin	Antiseptic, stimulating
Calendula	From the marigold plant; good for itching, swelling, and acne	Healing, soothing, anti-inflammatory
Carrot	Used in creams and masks; rich in vitamin A	Antioxidant, moisturizing, soothing
Chamomile	Plant extract; used for sensitive skin	Calming, anti-inflammatory
Cocoa butter	Softens and lubricates; from the cocoa tree	Moisturizing
Coconut	Commonly used for oils, soaps, and creams	Lathers, cleanses, lubricates
Comfrey	Has many beneficial and soothing qualities; contains allantoin	Healing, moisturizing, emollient
Coneflower	<b>Echinacea</b> (ek-uh-NAY-shah) is from the coneflower; used internally to support the immune system	Healing, preventing infection
Cucumber	Commonly used for masks and the eye area to reduce puffiness	Antiseptic, soothing
Eucalyptus	From the gum tree; used for acne and oily skin	Antiseptic, antimicrobial, astringent, stimulating
Evening primrose	Soothing; known to help women's menstrual pain	Treats dry skin, flakiness; healing
Geranium	Calm irritation, an anti-irritant	Astringent, anti-inflammatory
Grapeseed extract	A soothing antioxidant derived from grapes	Healing, moisturizing, antiaging
Green tea	Many health benefits include lipid protection; antibacterial, stimulating	A strong antioxidant and anti-inflammatory
Horsechestnut	A plant extract with bioflavonoids (vitamin P); strengthens capillary walls	Good for couperose skin and redness
Jojoba	A widely used noncomedogenic oil derived from a desert shrub; healing	A soothing emollient, moisturizer, and lubricant
Kojic acid	A tyrosinase inhibitor; usually derived from mushrooms	A skin-lightening agent for hyperpigmentation
Lavender	A popular herb and oil used for aromatherapy and calming	Soothing, anti-inflammatory, antiseptic properties

▲ Table 13–4  
Ingredients from Nature.

*continued*

## INGREDIENTS FROM NATURE

Some of the following natural ingredients are derived from plants (phytotherapy), and some are also produced synthetically.

Licorice	An anti-irritant good for sensitive skin; also inhibits melanin production	Soothing, used to lighten surface hyperpigmentation
Mint	An herb good for circulation	Stimulating, also an antiseptic
Oatmeal	Good for skin irritation, rashes, and sunburns; used in masks and scrubs	Soothing, anti-inflammatory, healing
Olive	Olive tree extracts are used for many beauty products	Moisturizing and calming
Orange	Soothing with an aromatic, uplifting scent	Anti-inflammatory, antibacterial, and an astringent
Papaya	Contains papain, an enzyme used in enzyme peels	Exfoliating, softening, moisturizing
Peppermint	Cools skin and constricts capillaries; has refreshing properties; contains menthol	Reduces irritation and itching
Pineapple	Contains bromelain, an enzyme with stimulating and antiseptic properties	Good for exfoliation and treating blemishes
Pomegranate	A powerful antioxidant; treats sun damage	Healing, fights free radicals
Rose	One of the most common ingredients in skin care products; used for dry, aging skin	Soothing and moisturizing
Sandalwood	An exotic scent used for aromatherapy; good for skin irritations	Soothing and antiseptic properties
Seaweed	Derivatives such as algae have many nourishing minerals and properties; detoxifies, stimulates metabolism; <i>may be a serious allergen if allergic to seaweed, shellfish, or iodine!</i>	Humectant and moisturizing properties, firming
Sesame	Used in massage and moisturizing products	Moisturizing
Shea butter	A natural fat used as heavier occlusive moisturizer.	Moisturizing and healing
Soy	A protein and a source of vitamins; an isoflavonoid (phytoestrogen) with antioxidant and anti-inflammatory properties	Anti-inflammatory, moisturizing
Tea tree	Good for oily skin and scalp treatments	Germicidal, healing antifungal, antiseptic
Witch hazel	From the hamamelis shrub; good for toning the skin	An astringent and antiseptic

▲ Table 13–4 (continued)

### FOCUS ON

#### Nanotechnology

Nanoparticles are submicroscopic particles of matter that range from 1 to 100 nanometers in size. The width of one hair is about 70,000 nanometers. Substances in nanoparticle form can penetrate deeper into the skin and have a higher reactivity. Because of their unique properties, the use of nanoparticles in skin care products has exciting potential applications, but also may raise health concerns. Normally inert chemicals can trigger chemical reactions and disrupt cell activity when combined in nanoparticles. Additionally, these particles do not dissolve as readily so they may stay in the body longer. Research continues on this fascinating technology.

► Table 13–5  
Essential Oils and Herbs.

### ESSENTIAL OILS AND HERBS

Here are some common essential oils or herbs used for their aromatherapeutic properties as well as skin benefits.

INGREDIENT	PRIMARY PROPERTIES	SKIN BENEFITS
Benzoin	astringent	oily skin; acne
Bergamot	soothing	oily skin; acne
Birch leaf	stimulating	moisturizing
Eucalyptus	stimulating	increases circulation
Evening primrose	soothing	moisturizing
Frankincense	soothing	healing; rejuvenating
Geranium	stimulating	antiseptic; healing
Jasmine	soothing	moisturizing
Lavender	soothing	healing
Lemon	stimulating	antiseptic for acne; oily skin
Lemongrass	stimulating	antiseptic for acne; oily skin
Melissa (lemon balm)	soothing	soothes irritation
Myrrh	healing	soothes irritation; acne
Neroli	soothing	antiseptic for acne; oily skin
Orange	stimulating, uplifting	astringent
Patchouli	soothing	moisturizing
Peppermint	cooling	decreases circulation
Rose	soothing	moisturizing
Rosemary	stimulating	increases circulation
Rosewood	stimulating	healing; dry skin
Sandalwood	soothing	anti-inflammatory
Tea tree	stimulating	antiseptic; acne
Ylang-ylang	soothing	antiseptic; enhances circulation

► Table 13–6  
Natural Food Ingredients and Their Benefits.

### NATURAL FOOD INGREDIENTS AND THEIR BENEFITS

- Avocado—rich in vitamins and oil; beneficial for dry and sensitive skin.
- Cucumber—soothing and healing; commonly used as a mask or for eye pads.
- Eggs—egg white masks tone and tighten the skin.
- Herbs—many herbs and teas such as chamomile are used for masks and compresses.
- Honey—hydrating, toning, and tightening effects; used in masks and scrubs.
- Lemon—brightening, astringent.
- Oatmeal—soothing, healing; used in face and body masks.
- Papaya—exfoliating with enzymatic properties; papaya enzyme peels are popular.
- Potatoes—used for oily skin or to reduce puffiness in the eye area.
- Tea—reduces puffiness; great for the eyes.
- Yogurt—cleansing and mildly astringent; used in masks.

## COMMON COMEDOGENIC INGREDIENTS

HIGHLY COMEDOGENIC	MODERATELY COMEDOGENIC	MILDLY COMEDOGENIC
Linseed Oil	Decyl Oleate	Corn Oil
Olive Oil	Sorbitan Oleate	Safflower Oil
Cocoa Butter	Myristyl Lactate	Lauryl Alcohol
Oleic Acid	Coconut Oil	Lanolin Alcohol
Coal Tar	Grapeseed Oil	Glyceryl Stearate
Isopropyl Isostearate	Sesame Oil	Lanolin
Squalene	Hexylene Glycol	Sunflower Oil
Isopropyl Myristate	Tocopherol	Avocado Oil
Myristyl Myristate	Isostearyl Neopentanoate	Mineral Oil
Acetylated Lanolin	Most D & C Red Pigments	
Oleyl Alcohol	Octyldodecanol	
Octyl Palmitate	Peanut Oil	
Isostearic Acid	Lauric Acid	
Myreth 3 Myristate	Mink Oil	
Butyl Stearate		
Lanolic Acid		

\*Note: Mildly comedogenic ingredients are generally not a problem when used in diluted concentrations.

Check to see their ranking of concentration on the ingredient label.

## NONCOMEDOGENIC

Glycerin	Water	Sodium Hyaluronate
Squalane	Iron Oxides	Octylmethoxycinnimate
Sorbitol	Dimethicone	Oxybenzone
Sodium PCA	Cyclomethicone	Petrolatum
Zinc Stearate	Polysorbates	Butylene Glycol
Octyldodecyl Stearate	Cetyl Palmitate	Tridecyl Stearate
SD Alcohol	Propylene Glycol Dicaprate	Tridecyl Trimellitate
Propylene Glycol	Propylene Glycol Dicaprylate	Octyldodecyl Stearyl Stearate
Allantoin	Jojoba Oil	Phenyl Trimethicone
Panthenol	Isopropyl Alcohol	

▲ Table 13–7  
Common Comedogenic Ingredients.

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## Herbs and Plant Properties

Another classification system is to list ingredients by the category or properties. The following is a partial list of plant and herbal properties that have astringent, stimulating, calming and/or soothing, healing, and hydrating properties. Many of the plants or herbs listed have more than one property or effect on the skin or senses. Check out aromatherapy and herb books for more information on this intriguing subject.

## CAUTION!

Many people are allergic to seaweed and other ingredients such as salicylic acid and sulfur. A thorough consultation is imperative to avoid serious allergic reactions.

**fyi**

A necessary book for estheticians to have on hand is an ingredients dictionary, which lists the properties of hundreds of natural and synthetic ingredients. One example is *Milady's Skin Care and Cosmetic Ingredients Dictionary*, 2<sup>nd</sup> ed., published by Milady, a part of Cengage Learning.

Herb and Plant properties:

- **Aromatic:** lavender, mint, rose, orange, eucalyptus
- **Antiseptic:** peppermint, tea tree, clove
- **Astringent:** comfrey root, witch hazel, alum root, lemon
- **Stimulating:** eucalyptus, wintergreen, spearmint
- **Calming:** comfrey root (allantoin), chamomile (azulene), almond
- **Cleansing:** lemongrass, aloe
- **Healing:** chamomile, comfrey, aloe
- **Moisturizing:** rose, chamomile

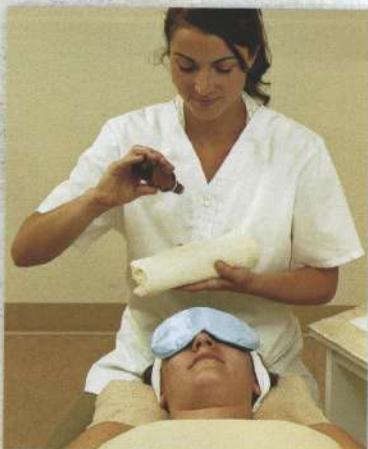
## Aromatherapy

**Aromatherapy** is an ancient healing practice using essential oils and aromas from plants to treat the body, mind, and spirit (**Figure 13–10a and b**). These plant components have medicinal and healing properties. The practice is used therapeutically for physical ailments and for mental balancing. Essential oils can affect the brain and emotions. The psychological benefits from essential oils depend on the oil chosen. Aromatherapy incorporated in esthetic services can make a treatment even more relaxing and effective.

To retain the plant's natural living properties, it must be extracted properly. Synthetically produced oils do not have the therapeutic value that natural oils retain. **Phytotherapy** is the use of plant extracts for therapeutic benefits. The different parts of the plants used for making products from oils and essences are the roots, bark, stem, seeds, and flowers. The extraction process can be expensive, and the way that essences are extracted determines their strength and quality.

Aromatherapy, a form of phytotherapy, must be used with caution. The pure oils are powerful and can irritate the skin or the senses if overused.

▼ Figure 13–10a and b  
Aromatherapy is used to treat the body, mind, and spirit.



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One or two drops of pure oil are usually enough. Some people are allergic to certain fragrances, and a wonderful facial could turn into an unpleasant experience if that oil is used. Study aromatherapy and the contraindications before using oils on clients.

There are many benefits of using aromatherapy oils for the skin. Oils can moisturize, stimulate, cleanse, soothe, and nourish. Plant extracts, teas, flowers, and fruits have therapeutic value when applied as compresses, masks, sprays, oils, or lotions.

### The Olfactory System

The body's **olfactory system** gives us our sense of smell, which is the strongest of the five senses. Scents have a strong effect on our reactions to places, products, and other people. Memories are also brought on by familiar scents. Aromatherapy scents affect us because of the sensitive olfactory system. Fragrances are a large part of our everyday life, from food scents to our perfume. Notice how fragrance influences our moods and how much more relaxed we are when the scent of a favorite candle diffuses across the room. Different blends of scents have different effects, both physically and mentally.

## Ingredients for Mature Skin

When working with mature skin, estheticians are expected to inform clients about the causes of their skin changes. Knowledge of hormone replacement, diet, and lifestyle influences is useful. Consider clients' needs, and use care when selecting treatments and suggesting home-care products.

Many ingredients are available to support the needs of mature skin. Topical ingredients need to have high-tech delivery systems, such as liposomes, to carry or deliver the ingredients effectively into the skin. One example of an effective formula to combat premature aging is a combination of alpha lipoic acid, vitamin C ester, DMAE, and glycolic acid. In addition to peptides and other antioxidants, the following ingredients are proven to have a positive effect on mature skin and rosacea:

- Green tea
- Dipotassium glycyrrhizate (licorice root)
- Squalane oil (vegetable oil from green olives)—rich in vitamins A, D, and E
- Seaweed
- Chamomile
- Micronized vitamin E
- Panthenol—vitamin B<sub>5</sub>

### Here's a Tip

Essential oils can be used in a variety of ways. Lighting a cinnamon candle in the winter can give the salon a cozy feeling, cheering up both clients and the staff. You can use a spray bottle to diffuse well-diluted essential oils in the treatment room, or spray it on the sheets and towels. You can create your own aromatherapy massage oil by adding a few drops of essential oil to a massage oil, cream, or lotion. Remember people are sensitive to scents, so do not overuse it. A little bit goes a long way in aromatherapy.

### CAUTION!

Essential oils are powerful. To prevent allergic reactions, they should be used with caution and only after proper training.

- Allantoin
- Guarana (an anti-inflammatory and decongestant)
- Rose essential oil

**Green tea** (from China and Japan) is an excellent everyday source of help for microcirculation problems. It contains polyphenols (strong antioxidants); essential oils; salts; calcium; potassium; manganese; copper; zinc; fluoride; vitamins A, B, and C; and caffeine. It is one of the best antioxidants available and provides effective lipid protection. Green tea is antibacterial, an anti-irritant, and provides UV protection.

**Licorice root** is 50 to 100 times sweeter than sugar and contains sugar, flavonoids (found in plants with yellow pigment), estrogens, amino acids, and polysaccharides. It is anti-inflammatory and a natural replacement for hydrocortisone (used to reduce rashes and redness). Licorice root also inhibits histamine release in allergic reactions. An antioxidant, licorice root lightens skin because it inhibits tyrosinase activity (melanin production).

**Vitamin K** has been used in products for blood coagulation. It is helpful for clients with telangiectasias and spider veins.  **L03**



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**▲ Figure 13–11**  
There is a limitless selection of facial products to choose from.

## Product Selection

All products are formulated for different skin types and conditions. The most important step in recommending products is determining which ingredients are best for an individual's needs. Learning about ingredients is necessary, and it takes time. Before applying a product, be sure to do a consultation and ask the client discreetly about any allergies she may have. No matter what the skin type, using the correct ingredients and following the proper steps in a home-care routine is essential for healthy skin.

Most skin care products (Figure 13–11) can be grouped into the following main categories:

- Cleansers
- Exfoliants
- Hydrators and moisturizers
- Sunscreens
- Toners
- Masks
- Serums and ampoules

### Cleansers

Cleansers come in many forms and should be used twice a day as the first step in a skin care routine. Cleansers that rinse clean with water

and do not strip the skin's natural acid mantle are the best choices. Different skin types require different ingredients to achieve this balance. All cleansers should leave the skin pH-balanced. Soap is not usually recommended; it can leave a film on the skin and can be quite alkaline, causing dryness and other problems.

### Cleanser Benefits

Skin cleansers have the following benefits:

- Cleansers dissolve makeup and dirt to keep pores clean and prepare the skin for other products.
- Cleansers may have emollients that soften dry skin.
- Cleansers may contain ingredients to counteract various skin problems.
- Additional ingredients can help certain skin conditions such as sensitivity, dehydration, or capillary problems.

### Types of Cleansers

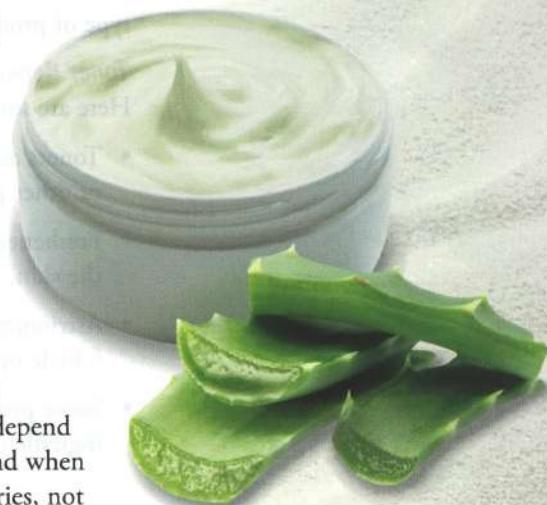
Cleansers for all skin types and conditions come in three basic forms: gels, lotions, and creams. All products are unique and depend on the ingredients in that particular product. Keep this in mind when reading about each product category. These are general categories, not absolutes.

A **cleansing gel** is a detergent-type “foaming” cleanser with a neutral or slightly acidic pH. Foaming cleansers are designed to dissolve more oil. Many people are accustomed to the foaming type of bar soap and want that “squeaky clean” feeling. Gels leave the skin feeling clean, but often a little tight or dry. Clients with oily or combination skin prefer foamy cleansers.

For acne-prone skin, an antimicrobial agent may be added to kill bacteria. Recommend gel cleansers with caution because they can dry out the skin. This often leads to irritation, stimulates an overproduction of oil in the skin, and can exacerbate acne.

A **cleansing lotion** is a water-based emulsion for normal and combination skin. For dry skin, “milky” lotion cleansers containing more oils or emollients that soften the skin are recommended. These cleansers do not strip the skin’s natural oil or pH balance. Additional ingredients can be added to cleansers to suit certain skin conditions such as sensitivity, dehydration, or capillary problems.

A **cleansing cream** is a water-in-oil emulsion used primarily to dissolve makeup and dirt. It is suitable for very dry and mature skin. Cleansing creams are heavier than cleansing lotions. Actors and other performers use these products to remove heavy stage makeup. Remember that like dissolves like, so oil dissolves oil. Cleansing cream should be removed with a sponge or a soft cloth; otherwise, a residue may be left on the skin. Cleansing creams may be followed by a toner or another cleanser to remove any residue.





**Makeup removers** are special cleansers designed primarily to remove eye makeup or heavier makeup. Makeup removers are generally oil-based. Most cleansers will remove makeup without needing an additional product. Some makeup removers need to be rinsed off because they can leave a residue on the skin or in the eye area.

## Toners

Toners, fresheners, tonics, and astringents are all essentially the same type of product; these terms are sometimes used interchangeably.

### Toner Benefits

Here are some benefits of using toners:

- Toners and similar products remove residue left behind by cleansers or other products.
- Fresheners restore the skin's natural pH after cleansing and hydrate the skin.
- Astringents have a temporary tightening effect on both the skin and follicle openings.
- Some products can help certain skin conditions, depending on the ingredients.

### Types of Toners

Toners, fresheners, and astringents have different properties and vary in alcohol content. These are watery liquids, used after cleansing in the skin care routine and generally before a moisturizer is applied. Toners can be applied to the face with a cotton pad or can be sprayed directly onto the skin (avoid the eyes).

- **Fresheners**, or skin freshening lotions, have the lowest alcohol content and are beneficial for dry and mature skin as well as for sensitive skin.
- **Toners** have a higher alcohol content and are designed for use on normal and combination skin. They tone, or tighten, the skin.
- **Astringents** have the highest alcohol content and are used for oily and acne-prone skin. They help oily and acneic conditions and remove excess oil on the skin, but some are too drying and should be used carefully.

## Exfoliants

### Exfoliation Benefits (Mechanical or Chemical)

Removing dead epidermal cells benefits the skin in many ways:

- Skin texture is smoother and softer.

- Follicle openings are cleaner.
- Deep pore cleansing and extraction are easier.
- The cell turnover rate is increased, bringing new cells to the surface more rapidly.
- The skin's ability to retain moisture and lipids is improved.
- Product penetration is improved, and delivery of ingredients into the epidermis is more effective.
- Blood flow and circulation are stimulated.
- Makeup application is smoother and more even.

Exfoliation is especially beneficial for the following conditions:

- Oily, clogged skin with blackheads, whiteheads, and minor acne breakouts
- Dry or dehydrated skin with cell buildup, flaking, and a tight, dry surface
- Dull, lifeless-looking skin (this skin condition actually has a tremendous buildup of dead cells that produces a slight gray color on the surface)

The term *exfoliation* refers to the peeling or sloughing of the horny (outer) layer of the skin, also known as the *corneum*. Many different types of peeling and exfoliation treatments are available, ranging from brushing treatments and light enzyme peels to strong surgical peels that can be administered only by dermatologists and plastic surgeons.

Alpha hydroxy acids (AHAs), gentle scrubs, and peeling creams all exfoliate dead skin cells that clog pores. Exfoliating the skin can treat a variety of skin problems and is necessary for healthy skin.

Use caution when exfoliating the skin. It is important to note that the esthetician's domain is the superficial epidermis, not treatments that involve the live layers of the skin below the epidermis. There are two basic types of exfoliation treatments: mechanical and chemical.

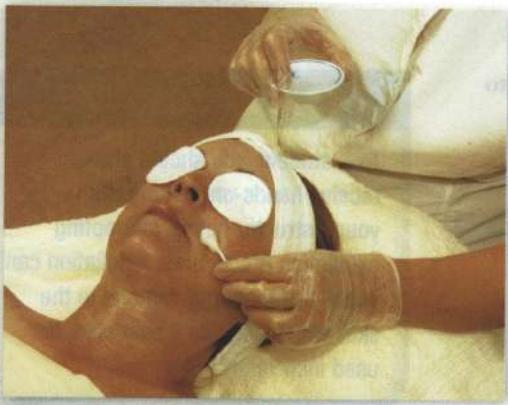
#### **Mechanical Exfoliants**

**Mechanical exfoliation** is a method of physically rubbing dead cells off of the skin. Examples of mechanical peeling treatments include granular scrubs, such as those made with almond meal or jojoba beads, or treatments that use a brushing machine. The movement of the brushes or scrubs removes cells from the surface of the corneum.

Granular scrubs are usually used after cleansing from one to two times per week and are rinsed with water. Frequency of use depends on the skin conditions. Exfoliation should be avoided if someone has sensitive or irritated skin. Microdermabrasion, a strong type of mechanical exfoliation, is covered in Chapter 19, Advanced Topics and Treatments.

#### **CAUTION!**

As a student, you should always receive hands-on training from your instructor before attempting exfoliation procedures. Exfoliation can cause irritation and damage to the skin and capillaries if overused, or used incorrectly.



▲ Figure 13–12  
Chemical exfoliation with AHAs.

### Chemical Exfoliants

In **chemical exfoliation**, dead skin cells and the intercellular matrix, or “glue” that holds them together (desmosomes), are dissolved by chemical agents such as AHAs (Figure 13–12). Chemical exfoliation products and procedures are discussed in Chapter 19, Advanced Topics and Treatments.

### Enzyme Peels

Unlike AHAs, enzymes digest only the dead cells on the surface. Superficial enzyme peels are mild. AHAs are much stronger than enzymes.

**Enzyme peels** involve the use of keratolytic enzymes, which help speed up the breakdown of keratin, the protein in skin. One enzyme often used is papain, which is derived from the papaya. Another frequently used enzyme is pancreatin (derived from beef by-products). Pumpkin and pineapple (bromelain) are other popular enzymes.

The enzyme peel is an exfoliating treatment for clients who are Retin-A® users and for ultrasensitive clients who have skin that is too sensitive for glycolic acid peels. Many acne clients (when first starting treatments) fall into this category. These peels digest keratinized epidermal cells, dislodge “sebaceous filaments” (sebum and other cellular wastes accumulated in the follicles), prepare the skin for extraction, and help fade and even out superficial irregular skin tone.

There are two basic types of enzyme treatments: masks and gommage. The most popular type of enzyme peel uses a powdered form of enzyme that is either mixed by the esthetician with warm water or can be purchased premixed in a base similar to a treatment mask. Other ingredients are combined in the peel formula to address different skin types and conditions. This type of enzyme treatment generally produces

### CAUTION!

To avoid damaging skin, do not use brushing machines, scrubs, or any harsh mechanical exfoliation techniques on these skin conditions:

- Sensitive skin
- Skin with many visible capillaries
- Thin skin that reddens easily
- Older skin that is thin and bruises easily
- Acne-prone skin with inflamed papules and pustules
- Skin medically treated with tretinoin (retinoic acid or Retin-A®), Accutane®, adapalene (Differin®), other acne drugs, azelaic acid, alpha hydroxy acids (AHAs), or salicylic acid (found in many common skin products)

a more even exfoliation of the cell buildup and helps to dilate the follicle openings slightly.

A second type of enzyme peel is a **gommage** (go-MAHJ), also known as **roll-off mask**, in a cream form that is applied and then massaged or “rolled” off the skin. This cream may contain paraffin or oatmeal. This treatment is actually a combination of an enzyme and a mechanical exfoliation (**Figure 13–13**).

## Masks

### Mask Benefits

Masks provide many benefits for the skin. Depending on their ingredients, they can do the following:

- Tighten and tone the skin
- Draw impurities out of the pores
- Clear up blemishes
- Hydrate
- Nourish
- Calm and soothe
- Rejuvenate the skin
- Brighten the complexion

### Types of Masks

A good **mask**, also known as **pack** or **masque**, can do wonders for the skin and, like most beauty treatments, the benefits of masks have been known for hundreds of years. Mask ingredients include herbs and vitamins, which can be combined in clay, seaweed, or hydrating bases. Masks come in powder form or premixed. Masks allow an esthetician to treat a variety of skin conditions at the same time.

There are two types of mask categories: *nonsetting* and *setting*. Nonsetting masks do not dry or “set up.” Setting masks harden or dry.

**Nonsetting Masks.** Nonsetting masks, such as cucumber or aloe, are designed to stay moist and are more hydrating. For home-care, masks are usually applied once a week, after exfoliation for best results and penetration. Also referred to as cream masks or gel masks, nonsetting masks are not formulated to dry. These nourish or treat the skin rather than give it a deep cleaning. They are highly beneficial for sensitive, couperose, aging, or dry skin because ingredients such as collagen, aloe, and seaweed have excellent hydrating properties.

Cream masks, which do not dry on the skin like clay masks do, are often used for dry skin. They often contain oils and emollients as well as humectants, and they have a strong moisturizing effect.



▲ **Figure 13–13**  
**Gommage** is used for exfoliation.

## Did You Know?

### The Inflammation Cascade

Inflammation can be caused by too much irritation from exfoliation or other factors and lead to premature aging. Stimulating the body's histamine activity that reacts to irritants and allergens causes the enzyme *collagenase* to break down collagen and the enzyme *elastase* to break down elastin. Natural hydrators in the skin, such as hyaluronic acid, are also lost when the skin is excessively irritated. Over-exfoliating can break down our natural protection and impede normal cellular functions. This is an example of "too much of a good thing."

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▲ Figure 13–14  
Applying a clay mask.

### CAUTION!

Remember that many people are allergic to seaweed and even shellfish, which is usually a contraindication for seaweed products. Serious reactions to marine-based products do occur, so use caution when using these ingredients.

Gel masks can be used for sensitive or dehydrated skin. They often contain hydrators and soothing ingredients and thus help plump surface cells with moisture, making the skin look more supple and hydrated.

Collagen masks are another great mask choice with many benefits such as plumping, calming, and diminishing wrinkles. Freeze-dried collagen sheets infused with ingredients are applied wet on the skin.

**Setting Masks.** Setting masks harden and contain setting ingredients, which dry and provide a complete barrier on top of the skin. Ingredients such as clay, alginate, paraffin wax, and gypsum (a kind of plaster) account for this effect. Keep in mind that some of these ingredients do not always set up, depending on the formulation and the purpose of the product.

**Clay Masks.** Clay masks draw impurities to the surface of the skin as the mask dries and tightens. Clay also stimulates circulation and temporarily contracts the pores of the skin. These masks contain clay, kaolin, bentonite, or silica for their tightening and sebum-absorbing effects. Stronger clay masks are used on oily and combination skin. Clay-based masks with sulfur have healing and antiseptic properties that have a beneficial effect on acne.

Clay masks are applied with a mask brush or the fingers and are allowed to set for about 10 minutes (**Figure 13–14**). After they are fully dried, clay masks are softened with towels or steam and then removed with cotton pads or towels.

**Algae and Seaweed Masks.** Alginate masks (AL-jun-ate) are often seaweed based. They come in powder form and are mixed with water or sometimes serums. After mixing, they are quickly applied to the face and then dry to form a rubberized texture. A treatment cream or serum is generally applied under them. The alginate mask forms a seal that encourages the skin's absorption of the serum or cream underneath. These professional masks are generally used only in the salon and are not retailed for home use.

Algae (derived from seaweed) is also used in other types of masks and products for its moisturizing properties, ability to smooth wrinkles, and detoxification. Seaweed is high in mineral content and therapeutic ingredients.

**Modelage Masks** (MA-dell-ahj), also known as **thermal masks**, contain special crystals of gypsum, a plaster-like ingredient. Modelage masks are used with nourishing products underneath. Mixed with water immediately before application and applied about  $\frac{1}{4}$ -inch (.6 centimeters) thick, the modelage mask sets up and hardens (**Figure 13–15**). The chemical reaction that occurs when the plaster and the crystals mix with water produces a gradually increasing temperature that reaches approximately 105 degrees Fahrenheit.

(40.5 degrees Celsius). Left on the skin, the mask gradually cools. The setting time for modelage masks is approximately 20 minutes.

Like other heat-creating treatments that increase circulation, modelage masks are very beneficial for dry, mature skin or dull-looking skin. This type of mask is not typically recommended for use on sensitive skin, skin with capillary problems, oily skin, or skin with blemishes. Massage is not recommended either before or after a modelage mask application, because blood circulation will already be increased from the mask. These masks can become heavy on the face and should not be applied to the lower neck or to clients who suffer from claustrophobia. These masks are used in the salon and are not retailed.

**Paraffin Wax Masks.** Paraffin masks are used to warm the skin and promote penetration of ingredients deeper into the skin through the heat trapped under the paraffin. The heat increases blood circulation and is beneficial for dry, mature skin or skin that is dull and lifeless. It has a plumping and softening effect on the skin.

Paraffin masks are specially prepared facial masks containing paraffin and other beneficial ingredients. They are melted at a little more than body temperature (98.6 degrees Fahrenheit or 37 degrees Celsius) before application. When applied, the paraffin quickly cools to a lukewarm temperature and hardens to a candle-like consistency (**Figure 13–16**). Paraffin masks are applied on top of a treatment cream as the paraffin, which has no treatment properties of its own, allows for deeper penetration of the cream's ingredients into the skin. The paraffin mask procedure is presented in Chapter 15, Facial Treatments.

**Custom-designed Masks.** Homemade masks derived from fresh fruits, vegetables, milk, yogurt, or eggs have been used traditionally for many years. Ingredients such as honey and almond meal or oatmeal can be mixed with milk into a paste for use as a mask. These masks are beneficial unless the person is allergic to a particular substance. Custom-designed masks can be fun to experiment with, but they are usually done at home rather than in a professional setting. Sanitation, regulations, and convenience preclude the use of homemade masks in the salon. Additionally, products not packaged by a manufacturer may not be covered under your employer's insurance. While problems are unlikely, there are insurance liability issues about any skin reactions to homemade products.

A client may ask about homemade products. It is important for estheticians to be familiar with these ingredients and to know why the quality of prepackaged professional products give more predictable results. Additionally, some product lines are designed to custom-blend products and estheticians can add ingredients to various products. This is a good way to customize treatments.



▲ Figure 13–15  
The modelage mask.

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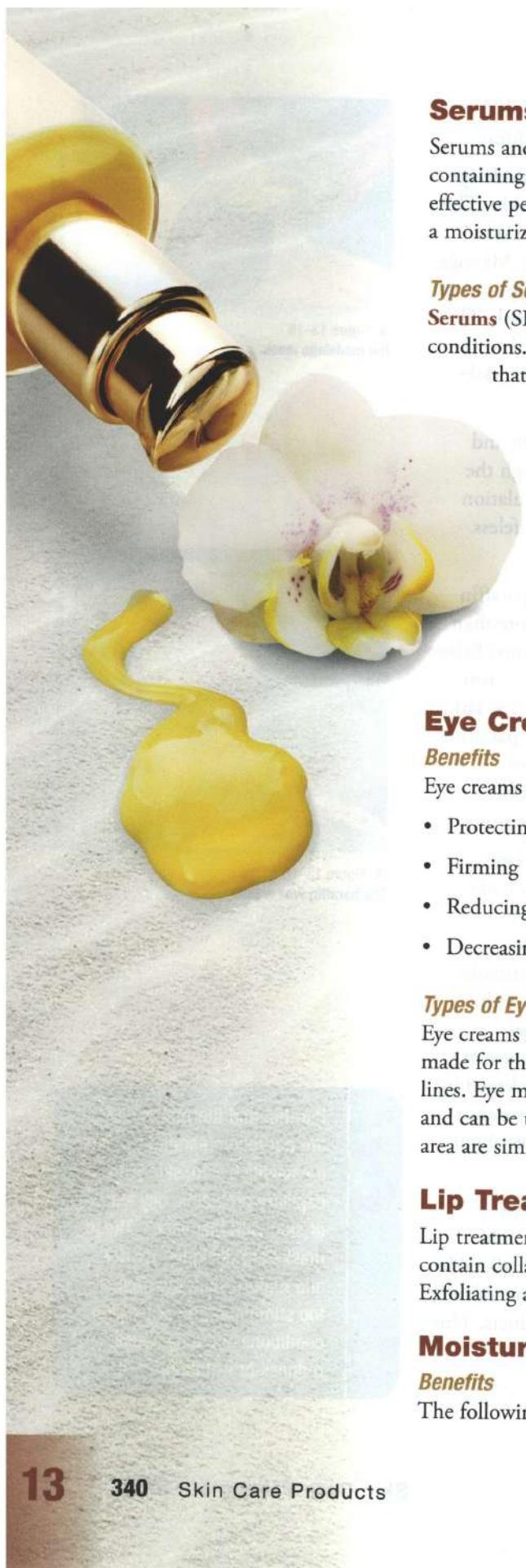


▲ Figure 13–16  
The paraffin wax mask.

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Paraffin and thermal masks are not recommended for use on sensitive skin, skin with capillary problems, oily skin, or skin with blemishes. These masks are designed for dry and mature skin; the heat is too stimulating for other skin conditions and may cause redness or irritation.



## Serums and Ampoules

Serums and ampoules are essentially the same type of product containing concentrated and specialized ingredients designed for effective penetration into the skin. These products are applied under a moisturizer, mask, or massage cream.

### *Types of Serums and Ampoules*

**Serums** (SIR-ums) are concentrated ingredients that target specific skin conditions. Serums are chemically formulated with smaller molecules that are able to penetrate further into the skin and thus are more effective. Serums are thin liquids made with performance ingredients such as vitamins, lipids, and antioxidants.

**Ampoules** (AM-pyools) are small, sealed vials containing a single application of highly concentrated extracts in a water or oil base. They are designed for a wide variety of skin types and problems. The advantage of ampoules is that they deliver highly concentrated performance ingredients in a premeasured amount. The extract is applied to the client's face with light massage movements until it has been completely absorbed.

## Eye Creams

### *Benefits*

Eye creams have several benefits, including the following:

- Protecting thin, delicate tissue
- Firming
- Reducing lines
- Decreasing puffiness

### *Types of Eye Creams*

Eye creams are usually thicker to protect thin, delicate tissue. Products made for the eye area include ingredients for firming and reducing lines. Eye masks, tea bags, or compresses are beneficial for the eye area and can be used in facial treatments. Products formulated for the eye area are similar to concentrated specialty creams and gels.

## Lip Treatments

Lip treatments include moisturizing balms and products. Some contain collagen derivatives or other ingredients to plump-up the lips. Exfoliating and healing ingredients are also used in lip conditioners.

## Moisturizers and Hydrators

### *Benefits*

The following are some benefits of using moisturizers and hydrators:

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- Protecting skin from the elements
- Nourishing skin through ingredients
- Balancing the oil–water content of skin
- Treating various skin conditions such as redness, aging, or dryness

### **Types of Moisturizers**

**Moisturizers** are products formulated to add moisture to the skin. Lotions, hydrators, and creams are all referred to as *moisturizers*. These products are used twice a day after cleansing to protect and nourish the skin. They are applied at the end of the facial and are intended for daily use as a day cream or makeup base (**Figure 13–17**). Moisturizer is a good general term to use with clients, even though technically there are differences in the products. Moisturizers are available for various skin types and conditions, from acne-prone skin to dry and mature skin.

Treatment creams and massage lotions are different forms of moisturizers. Moisturizers contain an ingredient that helps retain water within the surface layers of the skin. Hydrators are formulated with humectants that attract water to the skin.

Oil-based moisturizers contain emollients and are heavier and occlusive, designed to protect the surface and trap water under the cream. It is important to use a moisturizer to hydrate and balance the oil–water moisture content of the skin. Water-based moisturizers are lighter emulsions for combination to oily skin and are absorbed quickly and leave no residue on the skin's surface. Even oily skin needs the hydration and protection found in a hydrator. This skin type will try to overcompensate for dryness and produce more oil, or it will become dehydrated if it is not balanced.

A valuable ingredient included in some day creams is sunscreen. These creams are good only for incidental sun exposure. For direct sun exposure, stronger sunscreens must be used and reapplied often.

**Treatment Creams.** Treatment creams, also referred to as *nourishing creams*, are designed to moisturize and condition the skin—especially during sleep, when normal tissue repair is taking place. Treatment creams are often heavier in consistency and texture than moisturizers and they contain more emollient and active ingredients. Specialty treatment products for oily skin usually have very little or no emollient.

**Massage Creams.** Massage creams, lotions, or oils have a variety of bases and ingredients. These are designed to provide slip (gliding ability) for massage while also nourishing and treating skin conditions. Massage lotions are also blended with aromatherapy oils to use during

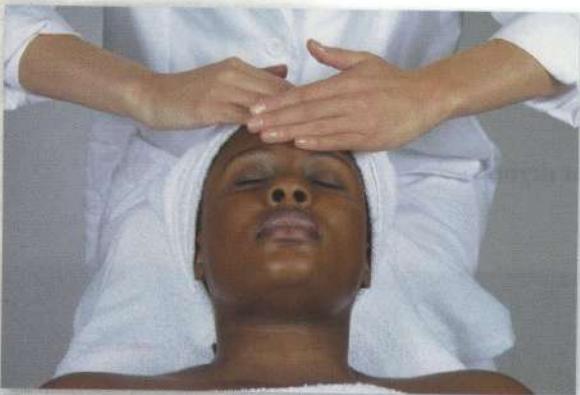


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▲ **Figure 13–17**  
Applying a moisturizer.

### **Here's a Tip**

With all product usage, choose the right formulas for your client's skin. Be sure to apply the appropriate amount of product; using too much can have adverse affects on the skin and wastes money on products.



▲ Figure 13–18  
Applying massage cream.

treatments (Figure 13–18). Choose the appropriate massage blend for the skin type.

## Sunscreens

Daily sunscreen is helpful to protect skin from UV radiation. An important part of an esthetician's job is to recommend sunscreen. Estheticians should stress to clients that sun exposure leads to skin cancer as well as to aging, hyperpigmentation, capillary damage, free radical damage, and collagen and elastin deterioration. Daily sunscreen can be in moisturizer form and comes in all weights and formulas.

Oil-free, light lotions that will not clog pores are available for oily skin. The amount of SPF labeled on products does not always match the protection level. The amount of face powders and lotions may need to be much thicker than the amount typically applied on the skin in order to match the SPF rating. Remind clients that these products are only for incidental sun exposure.

### Sunscreen Ingredients

Full-spectrum sunscreens protect the skin from both UVA and UVB exposure. Sunscreens absorb or reflect ultraviolet radiation. Categories of compounds that absorb UVB are salicylates and cinnamates. UVA-absorbing compounds are benzophenones. Most sunscreens now combine ingredients to target both UVB and UVA radiation.

Sunscreens that protect the skin from UVB include: octyl salicylate, octyl methoxycinnamate, oxybenzone, octylhomosalate, octocrylene, zinc oxide, and titanium dioxide.

Some of the sunscreens that protect the skin from UVA are: oxybenzone, avobenzone (Parsol 1789), benzophenone-3, butyl methoxydibenzoylmethane, mexoryl®, titanium dioxide, and zinc oxide.

Physical (nonchemical) sunscreens are broad spectrum sunscreens: zinc oxide and titanium dioxide.

*SPF* refers to the sun protection factor in sunscreens that delays sun-induced *erythema*. An SPF 2 sunscreen blocks 50 percent of UVB, allowing you to stay in the sun twice as long as you could with no sun protection. Increasing the SPF increases the protection. An SPF 15 sunscreen blocks 93.3 percent of UVB; and an SPF 30 sunscreen blocks 96.9 percent of UVB. But notice that doubling the SPF from 15 to 30 does not double the protection. In this case it increases UVB protection by only 3.6 percent, and at higher SPFs the increase is even less. Although doubling the SPF does not double the protection, the higher SPF increases the potential for sensitivity to the product due to the increase in the concentration of active ingredients. The SPF can be misleading and is based on many factors, not just the exposure time.

## ACTIVITY

Choose products and ingredients for different skin types and conditions according to your product line. Write-in ingredients and product types you think you would use. Use the ingredient tables in this chapter or a cosmetic ingredients dictionary to research your products.

PRODUCT TYPE AND INGREDIENTS FOR DIFFERENT SKIN TYPES AND CONDITIONS	Mature	Sensitive	Dry	Normal	Combo	Oily	Acne
cleansers	Example: <i>cleansing cream with antioxidants</i>						
exfoliants		enzyme <i>peel</i>					
masks	<i>collagen</i>						
massage lotions							
additives and oils		calming— <i>chamomile</i>					
toners							
serums							
moisturizers and sunscreen	<i>ceramides</i>						
eye and lip care products							

### Self-Tanners

Self-tanning lotions are formulated with dihydroxyacetone (DHA), an ingredient that reacts with the proteins (keratin) on the surface cells of the skin and turns them darker. Most self-tanners have no sunscreen protection; sunscreen should still be applied. Looking tan does not mean the skin has protection from sunburns or photoaging. Keep in mind that the “tan” look from self-tanners can disguise redness or sunburn.  L04  L05  L06  L07  L08



### Home-Care Products

Products the client can use at home are as important as those you use during the facial. The same principles that you use in determining products for treatments apply here. Give clients simple, precise instructions as to how and when to use the product. It is a good idea to give a home-care sheet to clients who may not remember what you told them. Your product line and specific treatments will determine what to

## CLIENT HOME-CARE INSTRUCTION SHEET

Write-in recommendations for clients from the product line you carry.  
Most product companies provide home-care sheets to give out to clients.

DAY	NIGHT	WEEKLY	PRODUCT RECOMMENDATIONS
1. Cleanser	1. Cleanser	1. Cleanser	
2. Toner	2. Toner	2. Exfoliation: 1-2 times/week	
3. Serums/eye cream	3. Serums/eye cream	3. Masks: 1-2 times/week	
4. Moisturizer	4. Moisturizer	4. Toner	
5. Sunscreen		5. Serums/eye cream	
		6. Moisturizer	

▲ **Table 13–8**  
Client Home-Care Instruction Sheet.



▲ **Figure 13–19**  
The home-care consultation.

### ACTIVITY

Using the client home-care instruction sheet, practice recommending products to someone you know. Pull out the retail products, explain each one, the benefits, a few of the main ingredients, and how to use them.

recommend. Explaining instructions, precautions, and realistic expectations will be beneficial to both you and your clients.

Use **Table 13–8** as a general home-care guideline for clients. Giving out product samples saves money for you and your clients: they help you determine what works best, and your clients will appreciate being able to try a product without investing a lot of money. A product guarantee and refund policy will depend on the place where you work. Satisfied clients are good for business and will be loyal if you take care of them.

Retailing products is not just about making sales. You are helping your clients take care of their skin. As you begin to work with clients, you become familiar with the needs of their skin and are more knowledgeable in recommending personalized products. Professional products sold only by licensed professionals (estheticians) are generally better formulated for individual needs. While professional products may cost more initially, they are usually more effective due to a higher concentration of performance ingredients—and this means less product is needed. With proper products chosen just for them, clients will see better results in their home-care (**Figure 13–19**). This saves your clients money in the long run because they will avoid wasting money in trying different products that might not be suited to their individual needs.

## Choosing a Product Line

Deciding what product lines to use and retail can be one of the biggest business decisions an esthetician can make. Whether a technician is self-employed or involved in choosing product lines for a salon owner, the product line and retail sales affect the success of the business. If the staff likes the product and use it at home, it will be easy to use in treatments.

It will also be easier to promote and sell.

When choosing a product line, take into consideration the following points:

- Are the ingredients high quality and beneficial?
- Are the products versatile—that is, effective for all skin types?
- Are the wholesale cost and the retail pricing affordable?
- Is the product name recognizable and reputable? Many clients choose a product based on its name and how it is marketed.
- How are the products packaged?
- What fragrances are used?
- What can clients in your area afford?
- What support can you anticipate from the company or supplier? The costs of samples and brochures, return policies, and marketing promotions affect your business.
- What educational opportunities and training are provided by the supplier? These can help you become more knowledgeable and successful.

There are countless skin care ingredients and hundreds of product lines for the esthetician to choose from. Researching the different product options will help estheticians become familiar with these choices. Knowing the daily skin care steps for maintaining healthy skin is necessary in making product recommendations. Choosing the correct product formulas for clients is important to effectively and safely treat the skin.

Understanding what ingredients do for the skin will make it easier to recommend and choose products. Ingredient and product technology is an exciting part of esthetics. It is an area demanding continuous attention and review, but it is also one of the most interesting aspects of the industry.

### Product Prices and Costs

Pricing and costs of products are a consideration for both you and your client. Product costs can be expensive if you do not choose wisely. Generally, the markup for retail products is 100 percent, or doubled from the wholesaler cost. Let your client know why professional products available only from licensed estheticians cost more than those they can purchase over the counter. Consider the quality of the ingredients and the concentration of performance ingredients in the products when comparing prices. When comparing skin care product lines, determine what you and your clientele like. Use **Table 13–9** on page 346 to compare and rate product lines.  L09

### Here's a Tip

To save time and be ready for the post-consultation, pull out recommended home-care products while the client is getting dressed after a facial. Show them what you recommend before they check out at the front desk.

### Here's a Tip

A good way to determine product cost is to break down the costs into daily or weekly amounts. This gives clients a better idea of how affordable the product is and how much they are spending on the recommended products, which is usually not more than a cup of coffee per day.

For example, if you have a product that costs \$50 for 2 ounces (56 g) and is estimated to last 6 months, then the cost is \$8.33/per month (the cost of \$50 divided by 6 months).

The cost per week is \$2.08 (\$8.33 for 1 month divided by 4 weeks in a month).

This is only .30 cents/per day (\$2.08 per week divided by 7 days/week).

*A very good price for maintaining beautiful skin. How much would it cost for your product line? Use three products and figure out the total cost per day for all three.*

CHART FOR COMPARING AND RATING PRODUCT LINES						
Use your own rating system—for example, rate products from 1 to 5 or from excellent to fair.						
PRODUCT LINE	CLEANSER	TONER	MOISTURIZER	EXFOLIANT	MASK	OTHER
Skin types						
Main ingredients						
Cost						
Quality						
Texture						
Scent						
Color						
Packaging						
Overall rating						

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▲ Table 13–9 Chart for Comparing and Rating Product Lines.

## ACTIVITY

Use Table 13–9 to compare and rate product lines. Make a copy of the chart, or create your own and fill in the blanks while sampling and testing different products.

## Web Resources

- [www.ams.usda.gov](http://www.ams.usda.gov)
- [www.cir-safety.org](http://www.cir-safety.org)
- [www.cosmeticscop.com](http://www.cosmeticscop.com)
- [www.cosmeticsdatabase.org](http://www.cosmeticsdatabase.org)
- [www.cosmeticsdesign.com](http://www.cosmeticsdesign.com)
- [www.fda.gov](http://www.fda.gov)
- [www.medscape.com](http://www.medscape.com)
- [www.nsf.org](http://www.nsf.org)



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# Review Questions

1. What is the FDA definition of cosmetics?
2. What is the main difference between functional and performance ingredients?
3. What functions does water serve in cosmetic formulations?
4. What are emollients?
5. Name three emollients other than oil that are used in skin care products.
6. Define comedogenicity.
7. What are essential oils?
8. Why are preservatives necessary in cosmetic products?
9. What is the function of humectants in skin care products?
10. What are the two basic types of sunscreen products?
11. What is the difference between a physical sunscreen and a chemical sunscreen?
12. Describe the symptoms of an allergic reaction to cosmetic products.
13. What two main product components are the most common allergens?
14. List five antioxidant ingredients.
15. What are the primary functions and benefits of antioxidants?
16. List four ingredients beneficial for mature or aging skin.
17. List two ingredients beneficial for acne.
18. List two ingredients beneficial for sensitive skin.
19. What are the main categories of professional skin care products?
20. What are the benefits of toners?
21. Describe the two basic types of exfoliation treatments.
22. What are five benefits of exfoliation?
23. List the benefits of a mask.
24. What is the difference between a nonsetting and a setting mask?
25. Why are moisturizers necessary?
26. What does SPF refer to?
27. Why is using sunscreen important?
28. List the steps in a good daily skin care routine.
29. What considerations are important in choosing product lines?

## Glossary

<b>alpha hydroxy acids</b>	Abbreviated AHAs; acids derived from plants (mostly fruit) that are often used to exfoliate the skin; mild acids: glycolic, lactic, malic, and tartaric acid. AHAs exfoliate by loosening the bonds between dead corneum cells and dissolve the intercellular matrix. Acids also stimulate cell renewal.
<b>alcohol</b>	Antiseptic and solvent used in perfumes, lotions, and astringents. SD alcohol is a special denatured ethyl alcohol.
<b>algae</b>	Derived from minerals and phytohormones; remineralizes and revitalizes the skin.

# Glossary

<b>allantoin</b>	An anti-inflammatory compound isolated from the herb comfrey; it is used in creams, hand lotion, hair lotion, aftershave, and other skin-soothing cosmetics for its ability to heal wounds and skin ulcers and to stimulate the growth of healthy tissue.
<b>aloe vera</b>	Most popular botanical used in cosmetic formulations; emollient and film-forming gum resin with hydrating, softening, healing, antimicrobial, and anti-inflammatory properties.
<b>alpha lipoic acid</b>	A natural molecule found in every cell in the body; it is a powerful antioxidant and is soluble in water and oil.
<b>alum</b>	Compound made of aluminum, potassium, or ammonium sulfate with strong astringent action.
<b>ampoules</b>	Small, sealed vials containing a single application of highly concentrated extracts in a water or oil base.
<b>anhydrous</b>	Describes products that do not contain any water.
<b>aromatherapy</b>	Therapeutic use of plant aromas and essential oils for beauty and health treatment purposes; involves the use of highly concentrated, nonoily, and volatile essential oils to induce such reactions as relaxation and invigoration, or to simply create a pleasant fragrance during a service.
<b>astringents</b>	Liquids that help remove excess oil on the skin.
<b>azulene</b>	Derived from the chamomile plant and characterized by its deep blue color; has anti-inflammatory and soothing properties.
<b>benzyl peroxide</b>	Drying ingredient with antibacterial properties commonly used for blemishes and acne.
<b>beta-glucans</b>	Ingredients used in antiaging cosmetics to help reduce the appearance of fine lines and wrinkles by stimulating the formation of collagen.
<b>beta hydroxy acids</b>	Abbreviated BHAs; exfoliating organic acid; salicylic acid; milder than alpha hydroxy acids (AHAs). BHAs dissolve oil and are beneficial for oily skin.
<b>binders</b>	Substances such as glycerin that bind, or hold, products together.
<b>botanicals</b>	Ingredients derived from plants.
<b>calendula</b>	Anti-inflammatory plant extract.
<b>carbomers</b>	Ingredients used to thicken creams; frequently used in gel products.
<b>carrot</b>	Rich in vitamin A, commonly derived from seeds and as an oil; also used as product colorant.
<b>certified colors</b>	Inorganic color agents also known as metal salts; listed on ingredient labels as D&C (drug and cosmetic).
<b>chamomile</b>	Plant extract with calming and soothing properties.
<b>chelating agent</b>	A chemical added to cosmetics to improve the efficiency of the preservative.
<b>chemical exfoliation</b>	Chemical agent that dissolves dead skin cells and the intercellular matrix, or “glue,” that holds them together (desmosomes).
<b>clay masks</b>	Oil-absorbing cleansing masks that draw impurities to the surface of the skin as they dry and tighten.
<b>cleansers</b>	Soaps and detergents that clean the skin.

# Glossary

<b>coenzyme Q10</b>	Powerful antioxidant that protects and revitalizes skin cells.
<b>colorants</b>	Substances such as vegetable, pigment, or mineral dyes that give products color.
<b>comedogenicity</b>	Tendency of any topical substance to cause or to worsen a buildup in the follicle, leading to the development of a comedo (blackhead).
<b>cosmeceuticals</b>	Products intended to improve the skin's health and appearance.
<b>cosmetics</b>	As defined by the FDA: articles that are intended to be rubbed, poured, sprinkled or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance.
<b>delivery systems</b>	Systems that deliver ingredients to specific tissues of the epidermis.
<b>detergents</b>	Type of surfactant used as cleansers in skin-cleansing products.
<b>DMAE</b>	Dimethylaminoethanol; antioxidant that stabilizes cell membranes and boosts the effect of other antioxidants.
<b>echinacea</b>	Derivative of the purple coneflower; prevents infection and has healing properties; used internally to support the immune system.
<b>emollients</b>	Oil or fatty ingredients that lubricate, moisturize, and prevent water loss.
<b>emulsifiers</b>	Surfactants that cause oil and water to mix and form an emulsion; an ingredient that brings two normally incompatible materials together and binds them into a uniform and fairly stable blend.
<b>enzyme peels</b>	Enzyme products that dissolve keratin proteins (dead skin cells) and exfoliate the skin.
<b>essential oils</b>	Oils derived from herbs; have many different properties and effects on the skin and psyche.
<b>exfoliants</b>	Mechanical and chemical products or processes used to exfoliate the skin.
<b>exfoliation</b>	Peeling or sloughing of the outer layer of skin.
<b>fatty acids</b>	Emollients; lubricant ingredients derived from plant oils or animal fats.
<b>fatty alcohols</b>	Emollients; fatty acids that have been exposed to hydrogen.
<b>fatty esters</b>	Emollients produced from fatty acids and alcohols.
<b>fragrances</b>	Give products their scent.
<b>fresheners</b>	Skin-freshening lotions with a low alcohol content.
<b>functional ingredients</b>	Ingredients in cosmetic products that allow the products to spread, give them body and texture, and give them a specific form such as a lotion, cream, or gel. Preservatives are also functional ingredients.
<b>glycerin</b>	Formed by a decomposition of oils or fats; excellent skin softener and humectant; very strong water binder; sweet, colorless, oily substance used as a solvent and as a moisturizer in skin and body creams.
<b>glycoproteins</b>	Skin-conditioning agents derived from carbohydrates and proteins that enhance cellular metabolism and wound healing.
<b>gommage</b>	Also known as <i>roll-off mask</i> ; exfoliating creams that are rubbed off the skin.

# Glossary

<b>grapeseed extract</b>	Powerful antioxidant with soothing properties.
<b>green tea</b>	Powerful antioxidant and soothing agent; antibacterial, anti-inflammatory, and a stimulant.
<b>healing agents</b>	Substances such as chamomile or aloe that help to heal the skin.
<b>herbs</b>	Hundreds of different herbs that contain phytohormones are used in skin care products and cosmetics; they heal, stimulate, soothe, and moisturize.
<b>horsechestnut</b>	Extract containing bioflavonoids; also known as vitamin P. Helps strengthen capillary walls; used for couperose areas or telangiectasia.
<b>humectants</b>	Ingredients that attract water. Humectants draw moisture to the skin and soften its surface, diminishing lines caused by dryness.
<b>hydrators</b>	Ingredients that attract water to the skin's surface.
<b>hydrophilic agents</b>	Ingredients that attract water to the skin's surface.
<b>jojoba</b>	Oil widely used in cosmetics; extracted from the bean-like seeds of the desert shrub. Used as a lubricant and noncomedogenic emollient and moisturizer.
<b>keratolytic</b>	Agent that causes exfoliation, or sloughing, of skin cells.
<b>kojic acid</b>	Skin-brightening agent.
<b>lakes</b>	Insoluble pigments made by combining a dye with an inorganic material.
<b>lanolin</b>	Emollient with moisturizing properties; also an emulsifier with high water-absorption capabilities.
<b>lavender</b>	Antiallergenic, anti-inflammatory, antiseptic, antibacterial, balancing, energizing, soothing, and healing.
<b>licorice</b>	Anti-irritant used for sensitive skin; helps lighten pigmentation.
<b>lipids</b>	Fats or fat-like substances; lipids help repair and protect the barrier function of the skin.
<b>liposomes</b>	Closed-lipid bilayer spheres that encapsulate ingredients, target their delivery to specific tissues of the skin, and control their release.
<b>lubricants</b>	Coat the skin and reduce friction; mineral oil is a lubricant.
<b>mask</b>	Also known as <i>pack</i> or <i>masques</i> ; concentrated treatment products often composed of herbs, vitamins, mineral clays, moisturizing agents, skin softeners, aromatherapy oils, beneficial extracts, and other beneficial ingredients to cleanse, exfoliate, tighten, tone, hydrate, and nourish and treat the skin.
<b>mechanical exfoliation</b>	Physical method of rubbing dead cells off of the skin.
<b>methylparaben</b>	One of the most frequently used preservatives because of its very low sensitizing potential; combats bacteria and molds; noncomedogenic.
<b>mineral oil</b>	Lubricant derived from petroleum.
<b>modelage masks</b>	Also known as <i>thermal masks</i> ; thermal heat masks; facial masks containing special crystals of gypsum, a plaster-like ingredient.

# Glossary

<b>moisturizers</b>	Products formulated to add moisture to the skin.
<b>noncertified colors</b>	Colors that are organic, meaning they come from animal or plant extracts; they can also be natural mineral pigments.
<b>oil soluble</b>	Compatible with oil.
<b>olfactory system</b>	Gives us our sense of smell, which is the strongest of the five senses.
<b>papaya</b>	Natural enzyme used for exfoliation and in enzyme peels.
<b>parabens</b>	One of the most commonly used groups of preservatives in the cosmetic, pharmaceutical, and food industries; provide bacteriostatic and fungistatic activity against a diverse number of organisms.
<b>paraffin wax masks</b>	Mask used to warm the skin and promote penetration of ingredients through the heat trapped under the surface of the paraffin.
<b>peptides</b>	Chains of amino acids that stimulate fibroblasts, cell metabolism, collagen, and improve skin's firmness. Larger chains are called polypeptides.
<b>performance ingredients</b>	Ingredients in cosmetic products that cause the actual changes in the appearance of the skin.
<b>petroleum jelly</b>	Occlusive agent that restores the barrier layer by holding in water; used after laser surgery to protect the skin while healing.
<b>pH adjusters</b>	Acids or alkalis (bases) used to adjust the pH of products.
<b>phytotherapy</b>	Use of plant extracts for therapeutic benefits.
<b>polyglucans</b>	Ingredients derived from yeast cells that help strengthen the immune system and stimulate the metabolism; also hydrophilic and help preserve and protect collagen and elastin.
<b>polymers</b>	Chemical compounds formed by combining a number of small molecules (monomers) into long chain-like structures; advanced vehicles that release substances onto the skin's surface at a microscopically controlled rate.
<b>potassium hydroxide</b>	Strong alkali used in soaps and creams.
<b>preservatives</b>	Chemical agents that inhibit the growth of microorganisms in cosmetic formulations. These kill bacteria and prevent products from spoiling.
<b>propylene glycol</b>	Humectant often used in dry- or sensitive-skin moisturizers.
<b>quaternium 15</b>	All-purpose preservative active against bacteria, mold, and yeast. It is probably the greatest formaldehyde-releaser among cosmetic preservatives; may cause dermatitis and allergies.
<b>retinol</b>	Natural form of vitamin A; stimulates cell repair and helps to normalize skin cells by generating new cells.
<b>rose</b>	Credited with moisturizing, astringent, tonic, and deodorant properties; found in the forms of rose extracts, oil, or water.
<b>salicylic acid</b>	Beta hydroxy acid with exfoliating and antiseptic properties; natural sources include sweet birch, willow bark, and wintergreen.

# Glossary

<b>seaweed</b>	Seaweed derivatives such as algae have many nourishing properties; known for its humectant and moisturizing properties, vitamin content, metabolism stimulation and detoxification, and aiding skin firmness.
<b>serums</b>	Concentrated liquid ingredients for the skin designed to penetrate and treat various skin conditions.
<b>silicones</b>	Oil that is chemically combined with silicon and oxygen and leaves a noncomedogenic, protective film on the surface of the skin.
<b>sodium bicarbonate</b>	Baking soda; an alkaline inorganic salt used as a buffering agent, neutralizer, and a pH adjuster.
<b>sorbitol</b>	Humectant that absorbs moisture from the air to prevent skin dryness.
<b>sphingolipids</b>	Ceramides, or lipid material, that are a natural part of the intercellular matrix. Glycosphingolipids and phospholipids are also natural lipids found in the barrier layer.
<b>squalane</b>	Derived from olives; desensitizes and nourishes; an emollient.
<b>squalene</b>	Originally from shark liver oil; also occurs in small amounts in olive oil, wheat germ oil, and rice bran oil; also found in human sebum. A lubricant and perfume fixative.
<b>stem cells</b>	Derived from plants to protect or stimulate our own skin stem cells; for health and antiaging benefits.
<b>sulfur</b>	Sulfur reduces oil-gland activity and dissolves the skin's surface layer of dry, dead cells. This ingredient is commonly used in acne products.
<b>sun protection factor</b>	Abbreviated SPF; ability of a product to delay sun-induced erythema, the visible sign of sun damage. The SPF rating is based only on UVB protection, not UVA exposure.
<b>tea tree</b>	Soothing and antiseptic; antifungal properties.
<b>tissue respiratory factor</b>	Abbreviated TRF; ingredient derived from yeast cells that functions as an anti-inflammatory and moisturizing ingredient.
<b>titanium dioxide</b>	Inorganic physical sunscreen that reflects UV radiation.
<b>toners</b>	Also known as <i>fresheners</i> or <i>astringents</i> ; liquids designed to tone and tighten the skin's surface.
<b>urea</b>	Properties include enhancing the penetration abilities of other substances; anti-inflammatory, antiseptic, and deodorizing action that protects the skin's surface and helps maintain healthy skin.
<b>vehicles</b>	Spreading agents and ingredients that carry or deliver other ingredients into the skin and make them more effective.
<b>water soluble</b>	Mixable with water.
<b>witch hazel</b>	Extracted from the bark of the hamamelis shrub; can be a soothing agent or, in higher concentrations, an astringent.
<b>zinc oxide</b>	Inorganic physical sunscreen that reflects UVA radiation. Also used to protect, soothe, and heal the skin; is somewhat astringent, antiseptic, and antibacterial.