Brighter, Whiter, New and Improved: Laundry Detergents and Soaps

Leader Resource

Detergents and soaps present many choices to the consumer. Lots of advertising money is spent trying to influence the consumer's choice of detergent. Consumers are encouraged to try new products or change brands.

Objectives

1. Describe differences in when to use a soap or detergent. Describe what detergents can and cannot do. Explain some of the terms associated with laundry detergents in your own words.
2. Examine detergent packages to learn how to use various products, differences among products, and safety related to the products.
3. Select detergents based on your needs, lifestyle, laundry equipment, water, and finances.

References

Laundry Detergents and Soaps, 4-H 92154, Oregon State University Extension Service*

(*Publication is available from your county Extension office for members who wish a copy.)


Judging How Much Laundry Detergent to Use and It's time to read Laundry Detergent Package Directions. Copies available free from:
The Soap and Detergent Association
475 Park Avenue South
New York, NY 10016

Preparation for Program

1. Read reference material. Decide which activities will best suit your group. Select at least one activity that uses products from Section A and one activity that involves the reading of labels from Section B.
2. Obtain supplies and equipment needed for program. The activity on differences between hard and soft water and soaps and detergents requires two packets of chemicals to be obtained from the textiles and clothing agent at your local county Extension office. Other supplies and equipment may include detergents and detergent boxes, water (tap water and distilled water from the grocery store), jars and lids, glass measuring cups, scales, index cards, butcher paper, and so on.
3. Become familiar with a variety of soaps and detergents by completing a comparison chart. (You may want to prepare a large size of the chart for discussion during the program.)

Activities

Section A—Use of Products

1. To learn the difference between a soap and a detergent and between soft water and hard water, do this activity. You also can see how a soap and a detergent perform in your local water.

Soaps clean satisfactorily in soft water (water without minerals), while detergents clean better in either soft or hard water (water containing dissolved minerals). If you live in a city, the local water department can tell you the "hardness" of the water. If you have your own well, your local Extension agent can refer you to a company that does commercial testing of water. (There may be a fee for having your water tested.)

Ardis W. Koester, Extension textiles and clothing specialist emeritus, Oregon State University.
Supplies
- Six quart jars with tight-fitting lids
- Tape for making labels, and a permanent or laundry marking pen
- Distilled water
- Tap water
- Two packets of chemicals obtained from county Extension office
- Laundry soap such as Ivory Snow or White King Soap
- Laundry detergent (avoid detergents containing carbonate builder)
- Six swatches of dark-colored pile fabric such as velour, terry, or corduroy, about 4 x 6" each
- Water softener such as Calgon or White King
- Water softener
- Tongs for lifting swatches out of jars

Procedures
Label the jars “soft - S,” “soft - D,” “hard - S,” “hard - D,” “tap - S,” and “tap - D.”
Pour 3 cups of distilled water into the two jars labeled “soft.”
Pour 3 cups of distilled water into the two jars labeled “hard,” then add a packet of chemicals containing the following ingredients to each jar:

- 1/4 teaspoon calcium sulphate
- 1/4 teaspoon calcium carbonate
- 1/4 teaspoon magnesium sulphate
- 1/4 teaspoon magnesium carbonate

(Note: The “hard” water may need to be prepared a day ahead or heated in a microwave oven to dissolve chemicals.)
Pour 3 cups of water from a faucet or local water source into the jars labeled “tap.”
Now, group the “soft - S,” the “hard - S,” and the “tap - S” jars into a set for adding soap. Next, group the “soft - D,” “hard - D,” and “tap - D” jars to become the other set for adding detergent.
Into each of the soap set of “soft,” “hard,” and “tap” water jars, add 1 tablespoon soap such as Ivory Snow or White King Soap. Put the lids on the jars and shake them. Are there differences in the amount of suds or the clarity of the water?
Into the detergent set of jars, add 1 tablespoon of laundry detergent. Put the lids on the jars and shake them. Are there differences in the amount of suds or the clarity of the water?
In which type of water (soft, hard, or tap) do the soap and the detergent make the highest suds? Does the tap water you are using more closely resemble the hard water or the soft water?

Label the fabrics “soft - S” (for soap), “soft - D” (for detergent), “hard - S,” “hard - D,” “tap - S,” and “tap - D.” Place each swatch in the appropriate water and soap or detergent jar. Shake the jar and swatch again. With tongs, lift out the swatches. Now squeeze the water out of the swatches and lay them on a towel. If there are white spots on the swatches washed with soap, these are precipitates commonly called “soap scum,” formed when the soap combines with the minerals in hard water. Detergents are designed to combine with the minerals and prevent the formation of soap scum on clothing.

Which kind of laundry product (soap or detergent) would work best with water from your tap? If your “tap” water more closely resembled the “hard” water, try adding some water softener. Now does it more closely resemble the soft water?

2. To learn how one ingredient, the surfactant (surface-active agent) in a detergent works, try this activity.
Prepare two glasses of tap water. With tweezers, carefully lay a sewing needle on the surface of the water in each glass. The surface tension of the water (or the attraction of water molecules to each other) keeps the water and the needles separate so the needle floats.
Now, add a teaspoon of liquid detergent to the water in one glass. What happens to the needle in that glass? It sinks because the detergent is a surfactant. A surface-active agent reduces the attraction of the water molecules to each other so that the needle sinks.
Water without a surfactant does not get in between the yarns of a fabric. Water alone will dilute and reduce the amount of dirt on clothing, but a surfactant helps the water to penetrate the surface of a fabric and clean better.
The amount of detergent to use is calculated for moderately hard water, an average-size washing machine, an average-size load of clothing, and an average amount of dirt. If any of these factors increases, then the amount of detergent must be increased also.

3. Try this activity to learn about the cleaning efficiency of various soaps and detergents.
For each different detergent and soap you have, prepare the following:
- Quarts jars with tight-fitting lids and masking tape labels (one jar for each detergent to be tested)
- Warm tap water (115 to 125°F)
- Permanent marking pen
- Measuring cup and spoons
- Eyedropper
Swatches of white all-cotton fabric (number of soils X number of detergents = number of swatches needed; for example, 4 soils X 6 detergents = 24 swatches)

Swatches of pastel polyester/cotton blend fabric (number of soils X number of detergents = number of swatches needed)

Swatches of nylon fabric (number of soils X number of detergents = number of swatches needed)

Swatches of medium to dark pile fabric (number of soils X number of detergents = number of swatches needed)

Soiling substances such as:
- dirt (particles)
- make-up (oily substance)
- spaghetti sauce (combination)
- tea or fruit juice (stain), etc.

Detergents to be compared (examples are called “Bright,” “White,” “New,” and “Improved”).

Prepare the fabric swatches by writing the name of a soiling substance and a detergent on a swath of each of the fabrics.

For example, you might have:

<table>
<thead>
<tr>
<th>Bright</th>
<th>White</th>
<th>New</th>
<th>Improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton-Dirt</td>
<td>Cotton-Dirt</td>
<td>Cotton-Dirt</td>
<td>Cotton-Dirt</td>
</tr>
<tr>
<td>Poly/cotton-Dirt</td>
<td>Poly/cotton-Dirt</td>
<td>Poly/cotton-Dirt</td>
<td>Poly/cotton-Dirt</td>
</tr>
<tr>
<td>Nylon-Dirt</td>
<td>Nylon-Dirt</td>
<td>Nylon-Dirt</td>
<td>Nylon-Dirt</td>
</tr>
<tr>
<td>Cotton-M-Up</td>
<td>Cotton-M-Up</td>
<td>Cotton-M-Up</td>
<td>Cotton-M-Up</td>
</tr>
<tr>
<td>Poly/cotton-M-Up</td>
<td>Poly/cotton-M-Up</td>
<td>etc.</td>
<td>Poly/cotton-M-Up</td>
</tr>
<tr>
<td>Nylon-M-Up</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Next, rinse and tumble-dry all the fabrics. (Use a hair dryer or towel and iron to dry fabrics if you don’t have access to a dryer.) Then lay the fabrics out on a table in a horizontal row by detergent. Also lay the fabrics with the soils in the same order so a soil forms a vertical column as shown.

<table>
<thead>
<tr>
<th></th>
<th>dirt</th>
<th>make-up</th>
<th>spaghetti</th>
<th>fruit</th>
<th>juice</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Bright”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poly/cotton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nylon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“White”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Poly/cotton</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Nylon</td>
<td></td>
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</tbody>
</table>

Compare the effectiveness of the various types of detergents in removing various soils. Remember this is just one cleaning cycle. Some differences among the detergents may occur over several launderings.

Discuss the results. Were there any detergents that were better at removing particles of soil, oily soil, combinations of soil, or stains? Were there any soils that none of the detergents removed? If so, these may need pretreating before laundering.

Now apply the soiling substance to each labeled fabric. Apply an equal amount to each fabric with a measuring spoon or eyedropper. Organize the fabrics by grouping according to the detergent name. In the example, put all the “Bright” detergents together, all the “White” detergents together, and so on.

Prepare the jars by writing the name of the detergent or soap on the label. Fill the jars with 3 cups of warm water. Add 1 teaspoon of detergent for each 1/4 cup of detergent recommended on the label. (For example, if the label recommendation calls for 1 cup of detergent, use 4 teaspoons.)

Place one swatch of each type of fabric with each type of soiling substance in the jar labeled with the detergent name. (You will have a total of the number of fabrics times the number of soils.) Put the lid on the jar and shake it for 1 minute.

Section B—Reading Labels

1. To learn about the information available on product packages and compare products, try this activity on reading package information. Look at several packages and find the following information:
   - Brand name and trademark registration
   - Type of product
   - Manufacturer, address, and toll-free number
   - Net contents
   - General claims of manufacturer (what product can and can’t do)
   - List of ingredients (what they do, if information is given)
How to use the product
How much to use
Use with or avoid other products
Other uses
Cautions or safety warnings
Cost of product, cost per unit purchased, cost per unit used (cost per unit used in Activity 5)

Put the above information on 6 x 8" cards for each product. Next, make a large chart titled Types of Laundry Detergents and Soaps, with categories across the top for Soaps, Powdered Laundry Detergents, Liquid Laundry Detergents, Light Duty Detergents, and Specialized Detergents. The headings for your chart might look like this:

<table>
<thead>
<tr>
<th>TYPES OF LAUNDRY DETERGENTS AND SOAPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOAPS     POWDERED     LIQUID     LIGHT DUTY     SPECIALIZED</td>
</tr>
</tbody>
</table>

Now, tape the cards for the various products under the categories. Discuss the differences among the different categories of products. Next discuss the differences among the products within each category.

2. Another way of looking at detergents is to classify them by the builders. The builders are an ingredient that helps the surfactants. A list of builder classifications is listed in the publication on Detergents and Soaps. List the six classifications across the top of a large chart. The heading for the chart might look like this:

<table>
<thead>
<tr>
<th>CLASSIFICATIONS OF DETERGENT BY BUILDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHOSPHATE     HIGH    LOW     CARBONATE     SILICATE     CITRATE     CITRATE NONBUILT     LIQUIDS</td>
</tr>
</tbody>
</table>

(Use the cards prepared for activity B.1. or prepare a set of cards with the information on brands, type of product, etc.)

Remove the cards taped under "Powdered Laundry Detergents" and "Liquid Laundry Detergents" from the "Types of Laundry Detergents and Soaps" chart and tape the cards under the builder categories.

Discuss the differences and similarities among the various products. Ask the group why they buy and use certain products. Are they currently using the products correctly and to best advantage? Are there any product cautions or warnings on the labels? Where can they go for answers about a product or problems with a product?

3. Comparing costs. Using a cup and a scale, measure and weigh the amount of detergent recommended for a top loading regular size machine. Use the formula in the publication on detergents and soaps to determine the cost per use. Because detergents vary in the density or concentration of ingredients, the recommendation for the amount to use varies. The amount to use is based on the formula of the detergent, an average-size washing machine, an average-size load of clothes, an average amount of soil, and moderate water hardness. If you have a larger-size machine, larger-size load, or dirtier-than-average load of clothes, use more detergent.

Discuss the results of just dumping in detergent without measuring. What could happen to the clothes if you didn’t have enough detergent? What would be the cost in the long run? What could happen if you used too much?

If possible, compare the costs of various-sized packages of one detergent. Is the largest size the most economical? Compare the costs per use of the various detergents. Add this information to the detergent comparison chart.

Prepared with contributions and suggestions from former Extension agents Dora Rumsey, Curry County; Loma Loefler, Klamath County; and Billie Stevens, Hood River County; and Janice Gregg, Extension agent, Jackson County; Oregon State University.

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