

Evaluation of Detergents and Cleaning Aids

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The object of this experiment is to determine the effectiveness of standard cleaning materials.

Modern detergents claim to be effective in removing stains from fabrics. These detergents may contain additives such as bleach alternatives, enzymes, or additional substances to not only clean, but to preserve the appearance of your clothes. In some instances, individuals may desire to use a standard detergent without additives and add additional additives as they choose. Some common, additional additives are listed in Table 1.

Additive	Composition	Product names	Function
Chlorine bleach	Sodium hypochlorite, NaClO	Clorox bleach	Stain remover for whites
Non-chlorine bleach	Sodium percarbonate (also called tetrasodium hydrogen peroxide dicarbonate), $2\text{Na}_2\text{CO}_3 \cdot 3\text{H}_2\text{O}_2$ Sodium carbonate, Na_2CO_3	Oxi-Clean	Stain remover for colors
Non-chlorine bleach	Sodium carbonate, Na_2CO_3 Sodium perborate monohydrate, $\text{Na}_2\text{B}_4\text{O}_7 \cdot \text{H}_2\text{O}$ Sodium silicate, Na_2SiO_3 Polyethylene glycol trimethylnonylether (a surfactant)	Clorox 2	Stain remover for colors
Washing soda	Sodium carbonate, Na_2CO_3	Washing soda	Laundry booster
Borax	Sodium borate decahydrate, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$	20 Mule Team Borax	Laundry booster

Table 1. Some common laundry additives

Although many detergents do live up to the claims by their manufacturers, variations in washing at home or in a laundry may affect results. Some of these variation include the hardness of the water in your area, the actual temperature of the wash water, and the type and condition of the washing machine.

Materials Needed

2 pieces of cotton material 12 x 12 inches (30 x 30 cm)

Pencil

Ruler. 12-inch

Staining materials: (from the following list)

Make-up

Lipstick

Red Wine/grape juice

Ketchup or tomato sauce

Mustard

Egg

Butter

Baby food or jelly/jam

Chocolate or cocoa

Tea or coffee

Soy sauce

Grass or plant leaves

Clay or soil (mud)

Grease or used engine oil

Ink (ball point pen)

Brushes or small sponges
Small plastic cups, 3 or 5 oz

Procedure

Using a pencil draw a grid on the cloth approximately 3 inches (7 cm) square.

Leave the upper left-hand square empty.

The staining material will be placed in small plastic cup with brushes, as needed.

Place stains in each square according to the chart below:

Cut off corner	Make-up	lipstick	grass/plant leaves
clay/soil	Engine oil	Butter	Soy sauce
ink	Tea/coffee	Chocolate	Egg
baby food Jelly or Jam	Ketchup or tomato sauce	mustard	red wine or grape juice

Cut off the corner of the cloth to provide a reference alignment.

Allow the cloth pieces to dry.

Wash the cloth pieces as follows:

One in laundry detergent. You may add this to any standard load of wash. **DO NOT PRE-TREAT ANY STAINS BEFORE WASHING**

One in laundry detergent with any additives such as a chlorine bleach, a non-chlorine bleach such as Clorox-2 or Oxi-clean, or any other additive you normally use. You may add this to any standard load of wash. **NOTE:** You may use a detergent with bleach alternative, **OR**, if you do not use any additives, use a second brand of detergent **OR** pre-treat stains with detergent or a product such as Spray and Wash or Shout.

Save the cloth pieces and attach them to your final report.

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Data and Results

Name _____ Course/Section _____

Partner's Name (If applicable) _____ Date _____

Where do you do your wash?

- At home (your own machine) Laundry room (apartment or dormitory)
 Laundromat Other: _____

What is the brand of the washing machine you used? _____

The washing machine is a Top loader Front loader

Sample 1

What detergent did you use? _____

What were the water temperature(s) in the wash and rinse?

Wash temperature: Hot Warm Cold

Rinse temperature: Hot Warm Cold

Did you use a second rinse? Yes No

Which stains were removed? _____

Which stains were only partially removed? _____

Which stains were not removed? _____

Sample 2

What detergent did you use? _____

What additive did you use? _____

