

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Worksheet: Even Soap is Science

Most people know that keeping clean is important, but have you ever thought about how soap works?

Did you know that scientists carefully create soap in order for it to work well?

That is right, the soap you use to wash your clothes and clean your hands exists because of many years of study. It takes the right ingredients in order to make a product that will work well.

Soap has changed a lot over the years, as scientists have learned new and better ways to clean. Learn how soap is made today and maybe someday you will create something that works even better!

This activity will introduce you to the science of soap products through use of colored sand. Ingredients in this activity are grouped together based on their function, or the role they play, in soap.

### Materials:

1 Small container with a lid or cap

Small spoon

Funnel

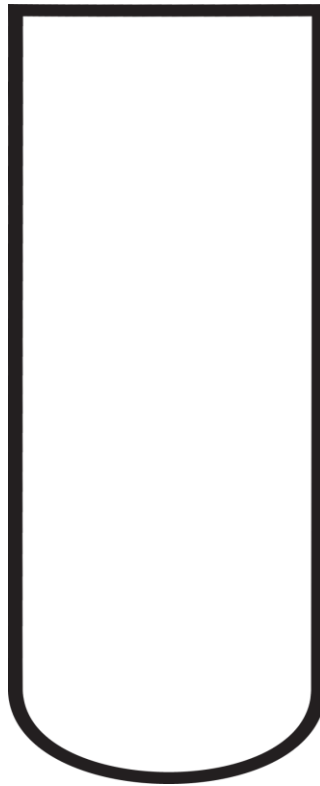
### Activity

Eight stations will be setup for you, each will have a different sand color. Move in order from Station 1 to 8. As you move through the stations, you will learn about an ingredient type in soap. Guess how much of that ingredient, or chemical, type is needed by adding that amount of sand to your container. Once your container is full, match your sand layers to the pictures at the last station to see how well you did.

### Ingredient Definitions

Type of Chemicals	Function (their role)
Solvent	Solvents help to blend the ingredients and give soap the right consistency so it's easy to use.
Surfactant	Surfactants are the chemicals in soap that remove germs and dirt. These chemicals hold onto the germs and dirt as the water washes them away.
Fragrance	Fragrances add a pleasant smell to the soap.
Preservative	Preservatives protect the product, keeping microscopic bugs from growing and eating the soap ingredients.
pH Adjuster	The pH adjusters raise or lower the pH of a solution making it either more acidic, or more basic, respectively. The pH level affects how well the soap does its job.
Other	Other ingredients in a soap may include: Dye—Gives soap a color Thickener—Gives soap the proper consistency to flow out of a bottle Moisturizer—Provides hydration and moisture to the skin Foam Enhancer—Helps create suds Builder/Chelating Agent— Provides extra cleaning power Antimicrobial—Kills germs on your hands or body

Color the picture below to match the layers of sand in your container. Label each layer with type of chemical it represents.



How is your hand soap different from the layers of sand in the preferred container?

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If you were a scientist experimenting with new ingredients that could make hand soap do more than just clean, what else would you want it to do? For example, scientists already make some soaps that also moisturize your skin.

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