W 1061-D

3-5 YEARS IN PROJECT

CLOTHING AND TEXTILES INTERMEDIATE PROJECT GUIDE

Unit IV. Caring for My Clothes (Care and Maintenance)

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Clothing and Textiles
Intermediate Project Area Guide

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Activity 10 - Reading Labels and Caring for Your Clothing
Activity 11 - The Nitty Gritty of Stains
Activity 12 - What's in That Detergent

Activity 10 - Reading Labels and Caring for Your Clothing

Project Outcomes:	• Follow instructions on clothing care labels when laundering. • Read labels to identify fiber content and care related to use of garment.

You probably care for or help with caring for your clothing. But are you taking the best care of your garments so they will last and look new for a long time?

The key to making your clothes last longer is to:
1. read the care labels and follow the instructions given and
2. have knowledge about the recommended care of garments made from specific fibers (such as cotton or polyester).

In the beginner guide of the Clothing and Textiles Project, you learned the basics of care labels and what's on the label. In this activity we will explore this and dive deeper into this topic so you can become an expert at taking care of your clothing.

To Get Started

When was the last time you checked the label of a garment to read the washing instructions?
_____ Within the past month
_____ Within the last six months
_____ Never

Do you check the care instructions before buying a garment? _____ Yes _____ No

First of all, let's review what you will find on a clothing label:

- Fiber content and what percentage of each (Ex: 50% cotton, 50% polyester)
- Name and associated number of the manufacturer
- The country of origin where processed or manufactured
- If fur, what animal is it from, is it dyed or bleached
- If wool, is it recycled wool
- How to care for your fabric

Now let's look at the nature of the most common types of fibers that are in our clothing, their characteristics and general guidelines for caring for clothing made from these fibers.

COTTON

Cotton is the most used fiber in the world. About 8 in 10 people in the world and U.S. consumers prefer garments made from cotton. If you think about what you wear most of the time, you will see that most items contain cotton: Jeans, t-shirts, socks, polo shirts, khakis, hoodies and sweats.

TO DO:

Look at the clothes in your closet or drawers that are 100% cotton. Think of and list the reasons you wear these garments:

_____

_____

_____

The Facts about Shrinkage in Garments

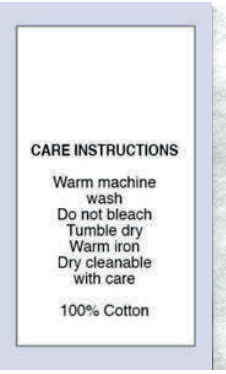
Clothes made of 100% cotton may need special care so they don't shrink. Many garments you buy today are preshrunk, but you can't be sure. Why do they shrink? Cotton fibers are relatively short in their natural form, since they come from cotton bolls on cotton plants.	

When a cotton T-shirt is made, for example, the cotton fibers are stretched and woven or knit together to create a product that is tougher and more resilient to damage. Doing this puts the fibers into a state of tension. When heat is applied, either through washing or drying, the tension is released causing it to shrink to its natural, shorter size.

It is important to note that since cotton fibers are short, through daily wear, washing and drying, the fibers tend to break off causing the garment to have a shorter wearable life. So, taking a few extra steps in caring for these garments will help them last longer and look newer longer.

General instructions for care of 100% cotton garments:

1. *Machine wash* in warm to cold water.
2. *Dry* on low or hang to dry.
3. *In order to minimize wrinkles:*
- take the clothing out of the dryer immediately after finished,
- if hanging garments to dry, tumble dry the clothes for about 5 minutes on low heat after they are dry, and
- use a steamer or warm iron.



Note: Some labels will be in two languages (in the case on the right, English and Spanish). Some labels also have symbols which give the washing instructions. Check Activity 9 in the Beginning Level of the Clothing and Textiles Project for a chart that shows what each symbol means.

COTTON/POLYESTER BLENDS

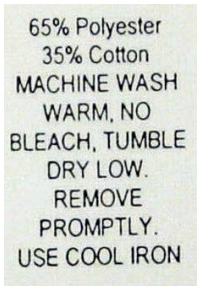
Sometimes two fibers are mixed together to produce fabric that has the desirable characteristics of each fiber. Cotton and polyester are the most commonly used blends. For clothing made of a cotton/polyester blend (Example: 50% cotton, 50% polyester), the following characteristics of each are combined to create a desirable end product:

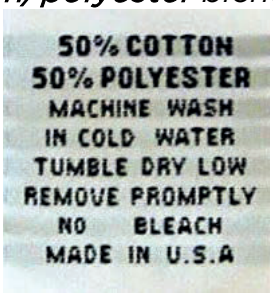
- *Polyester*: Doesn't wrinkle, shrink or stretch out of shape; abrasion resistant (lasts longer); strong.
- *Cotton*: Soft, comfortable, absorbant, breathes (allowing moisture to escape from the body).

So a fabric that is a cotton/polyester blend usually won't wrinkle or shrink when washed and dried and will feel comfortable and absorbant.

*General Instructions for care of **cotton/polyester** blend garments:*

1. *Machine wash* warm or cold;
2. *Dry* on low heat or hang to dry;
3. These garments don't tend to wrinkle, so no further care is needed.





Compare the care necessary for garments you own made of 100% cotton versus those made of a cotton/polyester blend.
Is there a difference? _____
Which would you rather buy based on your comparison?_____

POLYESTER

Polyester is a synthetic fiber, meaning it is created in a laboratory and not from natural sources. Polyester was discovered over 70 years ago as an effort to make a realitively inexpensive and easy care fabric.As mentioned earlier polyester has many desirable caracteristics including:

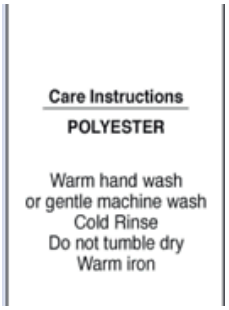
- doesn't wrinkle, shrink or stretch out of shape,
- is abrasion resistant (last longer),
- is strong, and
- dries quickly.

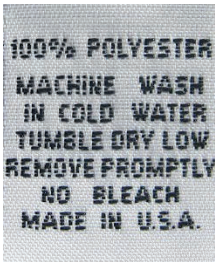
The drawbacks of polyester related to care include:

- there is a problem with pilling. This is when small balls of fiber form on the fabric in areas of friction such as elbows and under the arm.
- it is heat sensitive, so use low dryer and iron settings.

General Instructions for care of Polyester garments:

1. Machine or hand wash warm.
2. Tumble dry low heat or hang to dry. (remember it will dry quickly)
3. No need to iron but if needed, use low iron. Fabric will melt if iron is too hot.





TO DO

1. Find two to three items in your closet that are made from 100% polyester. Check the care label and compare the care instructions to those above. How are they similar:

   _____

   _____

   How are they different:

   _____

   _____

2. Take the corner of each garment, wad it up in your hands and hold for 1 minute. Lay the garment on a flat surface and notice if the area you 'distressed' is wrinkled or not. Do this with each garment. What did you find?

   _____

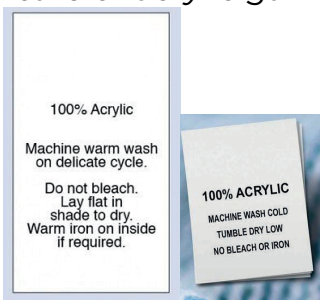
   _____

ACRYLIC

Acrylic is a synthetic fiber that is used a lot in sweaters, hoodies and winter wear. It is easier to take care of and less expensive than garments made of wool.
Here are some of the great characteristics of acrylic: soft, warm, light weight and doesn't wrinkle. But like polyester, acrylic tends to pill and is heat sensitive.

General Instructions for care of acrylic garments:

1. Machine wash warm to cold.
2. Lay sweaters flat to dry; for other garments, tumble dry on low heat or hang to dry.
3. Do not iron.



WOOL

When we think of wool garments we think of cold weather and winter jackets. This is because of one of the qualities of wool that it keeps you warm and dry. Air is trapped in the wool fibers that will keep you warm without feeling heavy. You will find sweaters, scarfs and even men's suit jackets made from wool.
The advantages of wearing wool include:

- wool is durable,
- wrinkle resistant, and
- water repellent.

The disadvantages of using wool include:

- it shrinks when it gets wet (unless preshrunk),
- prone to insect damage,
- some people have allergies to wool, and
- it may need to be dry cleaned.

Some forms of wool today are washable, so be sure to look at your label before buying.

General instructions for care of wool garments:

1. Check your label. If washable, hand wash in cool water.
2. Lay flat to dry.
3. No need to iron.
4. Always clean or have your wool garments dry cleaned before storing since moths will eat holes in the fabric if it is soiled.

SILK

Silk is considered a luxury fabric, but garments made of silk are readily available such as tops, blouses, scarves and dresses at reasonable prices.
Characteristics of silk:

- Silk fabric feels smooth to the skin.
- It is breathable, so you won't feel clammy as with polyester fabric.
- Silk can be damaged by deodorants. So, make sure your deodorant is dry before putting on a silk garment.
- Silk garments are usually washable, but some individuals prefer to dry clean them in order to preserve the look of a garment.

General instructions for care of silk garments:

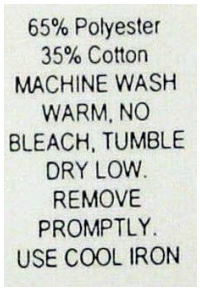
1. Hand wash in cold water.
2. Hang to dry.
3. If ironing is needed, use a warm iron and don't put the iron directly on the garment by using a press cloth.

Caring for your Garments

Now that you know the recommended care of garments with specific fiber content, it's time to take a look at your clothing and their labels.

When caring for your garments, be sure to follow simple instructions which include:

1. Sort your clothes, putting light colored garments in one stack and dark colored in another stack.



2. Now separate these stacks into piles according to the care needed: warm, cool/cold or hand wash.
3. You may find that you only have a small load for each. Do NOT combine light and dark clothes. If you do, your light-colored garments will look dingy and you may even find that the dark colored clothes will fade on them.
4. When washing items that are more delicate, select the delicate cycle so that the garments will receive less agitation.
5. You might consider if you have only 1-3 garments in one of your stacks to hand wash them even though they can be machine washed.

To hand wash garments:

- Pretreat the item as needed for stains, then turn the item inside out.
- Fill the sink with water, tepid/room temperature water is usually best.
- Add a small amount of mild detergent (1 tablespoon) and mix to prepare the bath.
- Submerge the item, use your hands to gently agitate the water.
- Rinse well. Use tepid/room temperature or cold water until the soapy water is gone and press out the water.
- Press the item against the sink to remove the water, being sure not to wring or twist the item.
- Lay the item on a bath towel and fold towel so item is inside to remove extra moisture.
- Hang or lay on a flat surface to dry (depending on the item).

What you can do with what you have learned

1. If you don't currently help with the laundry, offer to help, following the above instructions.
2. Take pictures of you sorting laundry, etc. to use in your portfolio.
3. Create and share a video of how to hand wash clothing.
4. Use the information about the characteristics of specific fibers and create a presentation/poster with the information including samples of fabric or garments.
5. Teach other 4-Hers what you have learned.

Activity 11 - The Nitty Gritty of Stains

Project Outcomes:	• Discover what happens to fabric to cause a stain when spills take place. • Select and use proper techniques for removing stains from clothing.

STEM concepts you will learn:
- The chemistry behind why stains appear on your clothing.
- The science behind treatments that will remove stains.

Have you ever spilled something on your clothes and caused a stain? Most of us have. Learning the science behind stains will help you discover how to remove them.

To Get Started
Think of the last time you spilled something on your shirt or pants. What was that item and what did you spill?

How a Stain Becomes a Stain

Stains come from many sources. Most of the stains come from spilling food on our clothing. Different foods create stains of different colors and different strengths.

Stains are a result of a chemical reaction between the staining substance and the fabric.

- Stains primarily form when a substance is spilled onto a surface and the molecules are trapped inside the fibers and pores of the fabric.
- The spilled substance coats the underlying material and the newly formed stain reflects back light of its own color, which is how the stain becomes visible to the naked eye.
- It's the same concept of how we see color. Every wavelength of light is absorbed except the color you see.

- For example, if you spill mustard on your shirt, all the colors in the spectrum of visible light but yellow are absorbed. So you see the yellow mustard stain.

(Source: http://www.sterlingcleaner.com/chemistry-stain-removal/)
How does the kind of fabric that something is spilled on make a difference?

Water swells **natural fibers** (like cotton and wool) but not polyester or acrylic (which are **manufactured fibers**).

- So, a water-based stain will go deeper into a natural fiber unless a special hydrophobic (water repellent) finish has been recently applied.
- Polyester or acrylic, in contrast, will repel water-based stains but adsorb oily ones unless a special finish has been fixed on those fibers. (Source: Smithsonian Museum Conservation Intitute)

Types of Stains

There are two fundamental types of stains: those that are water-based and those that are oil-based. Here are some common stains and how they are classified.

Water-based Stains:
- coffee or tea
- ketchup
- cola
- fruit juice
- jelly
- milk
- blood
- ink

Oil-based Stains:
- margarine or butter
- chocolate
- cooking oil
- mayonnaise and salad dressings
- peanut butter
- deodorant
- makeup

Removing Stains

Stains can be a challenge to remove. How much of a challenge depends on:

1. the chemical nature of the fiber (in the clothing),
2. the food spilled and
3. the length of time the stain has set (the longer the stain has been on a garment, the harder it is to remove).

The standard advice for removing stains is to follow the three P's of stain removal:

- promptness
- patience
- perseverance.

Using the correct cleaning product may help in reducing your frustration in removing stains. Stain removal requires strong products such as **cleaning enzymes, bleach or specialty solvents**.

Cleaning enzymes are included in some detergents and presoak products. They break stains into simpler forms that can then be attacked by detergents.	
Cholorine and oxygen bleaches whiten, brighten and loosen soils from fabrics. They break the connection between the stain and the fiber or they make the stain colorless through oxidation. Oxygen bleach is added to some detergents and is also sold as a separate product. Chlorine bleach is not added to detergent but is sold separately. All bleaches can damage fabric, so be sure to follow directions on the bleach and product labels.	

GENERAL TIPS TO FOLLOW:

1. The earlier you start to treat any stain the better.
2. Always remove any excess of the stain substance by blotting (never rubbing) the area with clean water (an ice cube works in a pinch) or running it under cool water.
3. Try carrying a stain stick or wipe in your purse or car so you always have a way to immediately pretreat a stain if you can't get to work on removal immediately.
4. Remember that you should never put the garment in the dryer until you're sure the stain is out. The heat of the dryer could cause the stain to set and become permanent.

You will find many guides on the Internet that address how to remove specific stains. The American Cleaning Institute (ACI) offers a reliable source: https://www.cleaninginstitute.org/cleaning-tips/clothes/stain-removal-guide

HANDS-ON EXPERIMENT – STAIN REMOVAL

Experimenting with Stains: Now that you have learned the science behind stains, try this experiment. Have fun!! IMPORTANT: Use the attached worksheet *before, during and after* the experiment.


Supplies needed:
- Newspapers or plastic to protect surface
- Permanent pen/marker
- 100% cotton fabric
- Cotton tip swabs
- Two 1-Gallon Plastic bags
- Detergent without enzyme and bleach (Arm & Hammer or Ivory Snow)
- Detergent with enzyme and bleach (Tide with bleach)
- Plastic spoon
- Hot Water
- Dishpan of cool water
- Paper towels
- Ketchup
- Mustard
- Grape juice
- Soy sauce

Note: Be sure to read the labels of the detergents so you will use the correct ones for this experiment.

Experiment: (Answer the "before" questions on the worksheet first.)

1. Cut two pieces of cotton fabric into 6-by-6-inch squares.

2. Label both pieces of the fabric as shown below:

K	G
M	S

3. Label one gallon plastic bag E and B (enzyme and bleach).

4. Using a cotton swab, apply a small amount of ketchup to each fabric sample on the K square, making a stain the size a little larger than a quarter. Be sure to rub ketchup into area.

5. Do the same thing with the mustard, grape juice and soy sauce. Let fabric set at least 5 minutes while you go to the next step.

6. Prepare the plastic bags that would simulate a washing machine. Place about 1 teaspoon of a detergent that contains cleaning enzymes and oxygen bleach (such as Tide with bleach) in the bag marked E & B. In an unlabeled plastic bag place 1 teaspoon of a detergent that does not contain enzymes or bleach (such as Arm & Hammer or Ivory Snow).

7. Add *hot tap water* to fill one detergent bag about one-quarter full. Place one of the stained fabrics in the bag. Push out the excess air while closing the bag. Set aside and repeat with second bag.
8. Check that the bag seals are secure. Squeeze, roll, or shake the bags gently for 5 minutes to simulate a washing machine. Keep the bags over your work area.
9. Open one bag and remove the fabric sample. Pour the detergent water into the sink.
10. Spread out the empty bag and lay a paper towel on top of it.
11. Rinse the fabric in a dish pan of cool water. Spread the fabric on the paper towel on the plastic bag to dry. The empty bag under the towel reminds you which detergent was used. You may change the paper towel a couple of times to get as much moisture out of the fabric as possible.
12. Repeat steps 9-11 with the second bag and fabric sample. Record your results on your worksheet. Adapted from: *In-Touch Science: Foods & Fabrics* (Cornell Cooperative Extension)

STAIN REMOVAL EXPERIMENT WORKSHEET

Before starting the experiment answer the following questions:	
1. Create a hypothesis: What do you think will happen to the stains when using detergent with no enzymes or bleach?	Hypothesis:
2. Create a hypothesis: What do you think will happen to the stains when using detergent with enzymes or bleach?	Hypothesis:
3. What do enzymes do to stains?	
4. What does bleach do to stains?	
During the experiment answer the following questions:	
5. How does the water change as you agitate the bag?	
6. How are the stains changing as you agitate the bag?	
After the experiment answer the following questions:	
7. What happened in general to the stains after 5 minutes of agitation?	
8. Which stains were more difficult to remove?	
9. Which detergent is better for removing stains?	
To think about after the experiment:	
10. Would using cold water make a difference in the stain removal? If you think so, how?	
11. What would happen if you didn't agitate the bag?	
12. Would the stains be harder to remove the longer the stain is on a garment? Why or why not?	
13. **What is one thing you have learned from this experiment that you will use?**	

By: Sue Byrd, Professor Emeritus, University of Tennessee at Martin
Adapted from: *In-Touch Science: Foods & Fabrics* (Cornell Cooperative Extension)
Additional Sources: http://www.sterlingcleaner.com/chemistry-stain-removal/; Smithsonian Museum Conservation Intitute; https://www.cleaninginstitute.org/cleaning-tips/clothes/stain-removal-guide

Activity 12 - What's in That Detergent

Project Outcome:	Identify the different ingredients in laundry detergent, their purposes and how your clothes get clean.

STEM concepts you will learn:
- The types of energy needed to clean clothes.
- The chemistry behind how detergent components work.
- The science behind the effect of types of water on the use of detergents to clean.

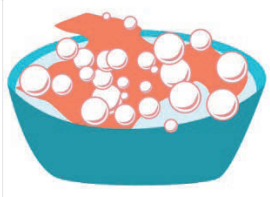
When washing your clothes, have you ever wondered how detergents actually get them clean? You may have noticed that your detergent has different ingredients and sometimes different colors. There are different components of detergents that help the cleaning take place.

To Get Started
Look at the label on your clothes detergent and write down the list of ingredients. Refer to this as you learn more about what's in that detergent.

How Your Clothes Get Clean

When clothes are dirty and need to be cleaned, energy is needed to make it happen. There are three different types of energy required:

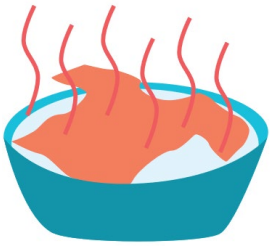
1. Chemical energy – The laundry detergent provides chemical energy. The composition of the detergent and the way the ingredients interact with the dirt and stains in your clothing make the cleaning process happen. What actually happens is that molecules in the detergent (that are so small you can't see them) attract stains and help pull the dirt away from your clothing.
2. Mechanical energy – The washing machine provides mechanical energy by moving the clothes back and forth and rubbing them together. This rubbing action helps loosen the dirt



from the surface of your clothes. When clothes need hand washing, you actually provide the mechanical energy by using your hands to rub the clothing together.

Source: Cleaning Institute

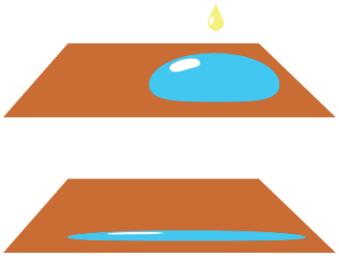
3. Thermal energy – Warm or hot water provides the thermal energy needed to clean clothes. Warm or hot water helps the stain or dirt dissolve quicker. When clothing needs to be washed in cold water, detergents have to work harder for the clothes to get clean.



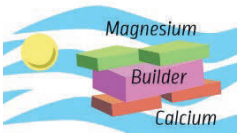
So What's in Your Detergent That Makes it Work?

The ingredients in your cleaning products fall into several different categories. These ingredients have different cleaning functions. Each product formula is a careful balance of various ingredients that will work best for what you are trying to clean.

Surfactants — Surfactants are the common active ingredient in detergents. They act as wetting agents that loosen dirt and suspend it in water. They may be anionic or nonionic — carrying an electrical charge. (Shown to right: After surfactant is added, water loses surface tension, which is what helps wet the fabric to get to the dirt.)

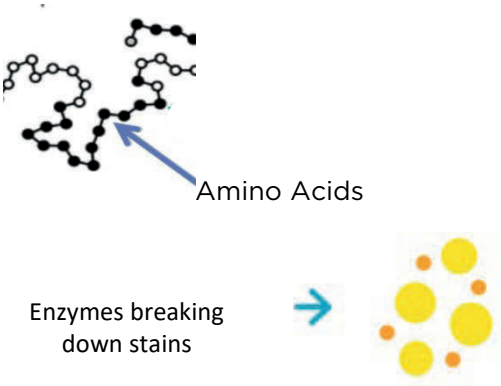


Builders — Builders aid in the cleaning benefit of the surfactant. They may function to bind with a mineral to then allow the surfactant to bind with the soil.



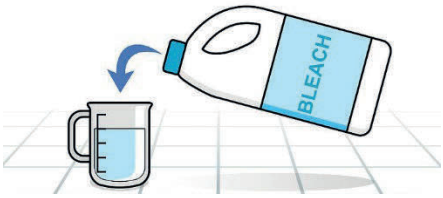
Solvents – Solvents are chemicals that help ingredients in liquid cleaning products stay mixed and give cleaning products the right thickness so they are easy to use.

Enzymes – In cleaning products, enzymes help to remove stains and help us to wash clothes in cold water. Each enzyme is made up of amino acids placed like beads on a string. When added to a detergent formula, each enzyme will be attracted to a certain type of stain (like gravy or grass). Once the enzyme finds a stain it likes, it gets to work breaking it down into smaller pieces and removing it from the surface of the fabric.



Chemical Cleaning Additives — These are chemical additives such as *color safe bleaches* and *water softeners* that aid in cleaning. Names such as sodium carbonate (this replaced phosphates that were found to harm the environment), sodium borate and sodium bicarbonate are some you may find.
Without a *water softener*, laundry demands extra detergent to prevent it from looking dingy. We call water "hard" if it contains a lot of calcium, magnesium or other minerals. Water softeners remove these minerals.

Bleach – Bleach converts soils into colorless, soluble particles which are easily removed by detergents, then carried away in the wash water. Bleach can also brighten and whiten fabrics and help remove stubborn stains.
Sodium hypochlorite bleaches (also called chlorine or liquid household bleach) are the more powerful laundry bleaches; they disinfect, as well as clean and whiten.
Oxygen (color-safe) bleaches are gentler, working safely on all washable fabrics. They work best in maintaining whiteness, not in restoring it.



Always read the fabric care label before using bleach on a garment. Always follow the instructions on the bleach panel.

Other additives — These are ingredients that may replace another laundry product that would be added separately, such as fabric softeners, optical brighteners and perfumes. In addition, silicates are added to protect metal parts of the washer from corrosion.
(Source: Cleaning Institute)

Additional Facts about Soaps and Detergents – For many years, soap (made by using soda ash and animal fat) was the primary cleaning agent. However, after World War II, chemists began to use natural substances, synthesizing them into chemicals, making what we know today as detergent. Today there is concern about the effect of detergents on the environment, especially the carbon footprint left by the use of detergent and also the toxicity to aquatic organisms and algae. That is why over the past couple of decades, a lot of plant based, eco-friendly laundry detergents have become popular, promising to clean your clothes without harming the environment.

TO DO
Now that you have learned about what's in the detergents you use to clean your clothes and how they work, take it to the next step:

1. Complete the experiment that follows. Be sure to take pictures of yourself in action for your portfolio.
2. Research more about one of the following: the chemistry behind how enzymes work; the effects of using petrochemical-based detergent on the environment; how soap was made in the mid-1800's.
3. Create a poster about what you have learned to exhibit at your club or a fair.

HANDS-ON EXPERIMENT

Testing the Difference in Natural and Synthetic Detergents

Now that you have learned the science behind how detergents work, it's time to do an experiment. **To begin this experiment**, compete the worksheet creating hypotheses of what you predict will happen during the experiment.

Supplies needed:
- Newspapers or plastic to protect surface
- Bath towel
- Permanent pen/marker
- 100% cotton muslin fabric
- Two 1-quart plastic containers
- Plant-based (natural) detergent (Mrs. Meyer's Laundry Detergent, Charlie's Soap)
- Petrochemical-based detergent (Tide, Cheer)
- Warm water
- Substances to stain fabric:
  - Ketchup
  - Butter
  - Orange juice
  - Make-up

Note: Be sure to read the labels of the detergents ahead of time so you will use the correct ones for this experiment.

Experiment:

1. Cut eight pieces of cotton muslin fabric into 6-by-6-inch squares.
2. Find four different sources of stain around the house. Examples: ketchup, butter, orange juice, make-up foundation, soil (dirt) from outside, etc.
3. Separate fabric into four stacks. Apply to each piece of fabric in the stack one of the substances you collected to stain the fabric. Let this dry naturally or by using a blow dryer. Write on edge of each fabric with permanent marker what the substance is you have applied.
4. Prepare solutions in two 1-quart containers as follows: In each put 3/4 quart of warm water and 1 tablespoon of detergent (plant-based in one and petrochemical-based in the other). Mark the lids of the containers to indicate the detergent used in each.
5. To begin your experiment, take two of the samples with the same stain on them, placing one in one container and the other in the second container. Secure the lids and shake the containers for 3 minutes to simulate a washing machine.
6. Open one container and remove the fabric sample. Pour the detergent into the sink. Take this sample and rinse under warm water for about 1 minute. Lay this piece out on a bath towel or similar substance, marking which detergent solution was used for later comparison.

7. Follow the same procedure (#6) for the second sample with the same stain.
8. Now follow procedures #4-7 for each of the stain samples.
9. Pat the samples with a cloth until they are reasonably dry.
10. Complete the worksheet with your findings and draw conclusions to your experiment.

TESTING THE DIFFERENCE IN NATURAL AND SYNTHETIC DETERGENTS WORKSHEET

Before starting the experiment answer the following questions:	
1. Create a hypothesis- Will there be a difference in the cleaning of stains with plant-based (eco-friendly) detergent versus petrochemical-based detergent?	Hypothesis:
2. Create a hypothesis: Will there be a specific stain that is harder to get out by both detergents?	Hypothesis:
3. Check the label of your detergents. Are there enzymes listed in the ingredients in each? If so in which?	
4. Is bleach listed as an item in either of these detergents? (It is better to use detergents without bleach for these experiments.)	
After the experiment answer the following questions:	
1. List Stain used: _____ Which detergent cleaned better? _____ Plant-based (eco-friendly) detergent _____ Petrochemical-based detergent	
2. List Stain used: _____ Which detergent cleaned better? _____ Plant-based (eco-friendly) detergent _____ Petrochemical-based detergent	
3. List Stain used: _____ Which detergent cleaned better? _____ Plant-based (eco-friendly) detergent _____ Petrochemical-based detergent	
4. List Stain used: _____ Which detergent cleaned better? _____ Plant-based (eco-friendly) detergent _____ Petrochemical-based detergent	
5. Overall, which detergent is better for removing stains? _____ Plant-based (eco-friendly) detergent _____ Petrochemical-based detergent	
6. Which stains were more difficult to remove?	
To think about after the experiment:	
10. What would happen if you didn't shake the container?	
11. Would the stains be harder to remove the longer the stain is on a garment? Why or why not?	
12. Would you consider using only the eco-friendly detergent? Why or why not?	
13. What is one thing you have learned from this experiment that you will use?	

Congratulations!

SCAN ME

You have now completed the fourth unit of the Intermediate Clothing and Textiles Project Area Guide. Throughout this project guide, you have learned about the tools and information for you to be successful in this project.

More information can be found on the Tennessee 4-H Clothing and Textiles project page, including the project outcomes. You are now ready to move on to the fifth unit of this project, Creating Clothing and Accessories.

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