

Harford District
2016 Cub Scout Day Camp
June 27 - July 1
Cub-struction

Adventures in Science II Chemical Reactions



Station Volunteer's Guide

Thank you for being a station volunteer! The stations are the heart of camp and truly provide our scouts with an opportunity to try out a new skill (or build on one they know) while having a great time. Our volunteers' knowledge and enthusiasm is what makes our camp great!

To make running the station easier, please take some time to read through the station guide. **While, what is being covered at the station needs to remain as outlined so that the scouts earn the correct achievements, how it is covered is only one of many methods.** If you find a better way to accomplish the requirements or if the method we have outlined doesn't seem to be working...please feel free to change it! This is only a guide...do what works best for you and the scouts coming to your station.

One other thing to keep in mind - some stations will be visited by all ranks. That means you may have 6 year olds through 11 year olds and may have to simplify or intensify the methods to meet the skills and knowledge of all the scouts.

Thanks again - we are glad to have you as part of Harford Day Camp!

Station Procedures

- The first station begins at 10:15 on Monday and 9:15 other days...so you have some time! We've tried to only schedule 2 dens at a time (max. 24 boys) but, there may be times when you have 3. Consult your station schedule so you will know who to expect and when.
- Greet dens as they arrive. Many will have a den cheer, ask to hear it!
- Once all the dens arrive or the start time has come, begin going through the procedures for the station. **It is very important that you start and end on time!** Each time slot lasts 45 minutes. If a den arrives 10 minutes late, they CANNOT stay 10 minutes past the end of the station...that would make you and them late for the next station. If a den doesn't get finished, suggest they come back during a break or take the remaining activity with them to work on at the den.
- **Execute the station with energy and enthusiasm!** Let the scouts do as much for themselves as possible. It doesn't need to be perfect, they just need to Do Their Best!
- Don't forget the beads. Each scout earns a bead at every station for participating. Beads can be given to the den leader for distribution.
- Once the den is finished, begin resetting for the next group.
- Close the station at the end of the day by packing/organizing the supplies and cleaning and disposing of all trash. Let the Program Director responsible for the station (either Tiger/Wolf/Bear or Webelos) know if supplies are running short!

Station Overview

Discussion and hands-on activities will complete this station.

This is a hands on active station. Experiments are meant to be fun and help scouts learn about chemical reactions. Each scout will view the demonstration and then complete four experiments. Rotate to another station after about 7-8 minutes. While the scouts are recording their observations, leaders can prep for the next group. Cups, bottles and canisters can be emptied and reused for the next group.

Core Values:

Responsibility - using the supplies carefully and as intended

Courage - trying new things

Set-up & Supplies/Ingredients:

Open station boxes and lay out ingredients for each experiment and for your demonstration:

For demonstration locate the Purple Paradox Demonstration. Follow the instructions to mix the solution in the test tube just before the group arrives.

Station 1: Milk, foam plates, food coloring, cotton swabs, dish liquid

Station 2: Clear plastic cups, jiffy indicator powder prepared (directions are on the indicator powder and gallon milk jugs for mixing), fill containers labeled "acid" with vinegar, fill the containers labeled "construction soap" with laundry detergent and the containers labeled "tool cleaner" with ammonia. Place a plastic spoon in each. Put out craft sticks to use for stirring.

Station 3: Film canisters (one for each scout). Fill containers labeled "construction water" with water. Fill containers labeled "sawdust tabs" with Alka Seltzer tablets broken in half.

Station 4: Empty plastic water bottles (one for each scout). Peroxide to fill each bottle with $\frac{1}{2}$ cup before the scouts arrive. Food coloring bottles. Dixie cups (one for each scout). Fill container labeled "yeast water" with warm water (needs to be warm for the yeast but not hot or it will kill the yeast). Plastic funnels. Containers of yeast. Liquid dish soap. Measuring spoons (tablespoon size). Craft sticks and pie plates. Bucket to fill with clean water to use for rinsing any accidental exposure to peroxide.

Break-Down

- 1) Tightly seal all ingredient containers and return to bins. Empty out any water and completed experiments.
- 2) Rinse out any bottles, cups and canisters so they can be re-used the next day.
- 3) Please assure that all bins are closed tightly and place under the tent for the night.
- 4) In the event that rainy weather is expected, please take the bins into the Crouse building for the night.

Station Objectives:

Each scout will: have fun preparing several experiments and watching the chemical reactions that result. You will be playing the part of the crazy science teacher.! You will need at least one volunteer to oversee each of the experiment stations. There are copies of the directions for each leader to use. Each scout can take their experiments book home with them so they can try the experiments again if they'd like.

"Welcome young cub-struction scouts. I'm {Fred}, scientist extraordinaire. Today you will be learning some cool science experiments. Let's start with an easy demonstration of my amazing abilities!"

Demonstration: Purple Paradox

Direct the scouts' attention to the test tube of "clear" liquid. Ask, "What color is this liquid?" They will tell you it is clear or colorless. "Are you sure? I like the color of the Ravens much better." Give the bottle a shake and it will magically turn purple. Set it back down. Tell the boys that you have changed your mind (the liquid will soon change back to colorless). After the oohs and aahs, tell them that they too will be learning how to mix some magical experiments with some astounding results.

Say, "Each of you will receive a "Experiments Handbook" to experiment with. All the ingredients have been gathered and assembled for you." (*direct their attention to the ingredients on each table*). Continue with, "Once you receive your experiments booklet and your safety glasses (which you must wear at all times), you should work your way through each of the experiments carefully measuring your ingredients and following the directions. None of these ingredients is meant to be put into your mouth so please keep that in mind at all times. Once you have successfully completed a experiment, record what happened in your experiments book and then your group will move on to another experiment's station".

Divide the group into 4 and send one group to each of the experiment stations to begin. Each station should be led by at least one volunteer. Den leaders may need to lend a hand too.

Station/Experiment 1: Dancing Milk

Instructor's Guide: Pour enough milk in the plate to completely cover the bottom to the depth of about 1/4 inch. Allow the milk to settle. Add one drop of each food coloring close together in the center of the pool of milk. Dip one end of the cotton swab into the dish soap. It's important not to stir the mix. Gently touch the end of the cotton swab into the colors and hold it there for a few seconds. The milk will dance sending the colors all over the plate.

Activity 2: Rainbow Elixir

Instructor's Guide: Gather 3 glasses and fill each glass half full with rainbow syrup (*jiffy juice indicator*). To change your syrup red, add 2 spoonfuls of acid (*vinegar*) to one of the glasses and stir. To turn your syrup green, add a spoonful of laundry soap to the second glass and stir. Try adding a spoonful of Borax to the third glass and stir.

Activity/Experiment 3: Barrel Launch

Instructor's Guide: This experiment needs to be done simultaneously by the scouts so that everyone is away from the table at the same time. Have them read through the directions and then guide them step by step so that everyone's' explosion happens about the same time.

Remove the lid from the canister and put a teaspoon of water into the canister. Now you have to act quickly...drop in one sawdust tab (*half of an alka seltzer tablet*) into the canister and snap the cap onto the canister (**make sure that it snaps on tightly.**) Quickly put the canister on the table **CAP SIDE DOWN** and **STEP BACK** at least 6 feet. About 10 seconds later, you will hear a POP! and the canister will launch into the air!

Caution: If it does not launch, wait at least 30 second before examining the canister. Usually the cap is not on tight enough and the build up of gas leaked out.

Activity/Experiment 4: Elephant Toothpaste

Instructor's Guide: Bottles should be prepared ahead of time with $\frac{1}{2}$ cup peroxide in each. Hydrogen peroxide can irritate skin and eyes, so put on those safety goggles and tell the kids to be careful not to spill or touch the liquid. **Buckets of clean water are available just in case.**

Add 4 drops of your favorite color (*food coloring*) into the bottle. Add 1 tablespoon of liquid dish soap into the bottle and swish the bottle around a bit to mix it. In a separate small cup, combine 3 Tablespoons of yeast water (*warm water*) with a 1 Tablespoon of powdered yeast and mix with a craft stick for about 30 seconds. Now the adventure starts! Place the bottle onto a pie plate. Set a funnel into the bottle and pour the dissolved yeast water mixture into the bottle all at once. Remove the funnel. Boys can touch the foam; it's just soap & water with oxygen bubbles. The bottle will feel warm to the touch because it's a heat producing reaction.

Have the boys repeat the experiment, this time using two tablespoons of dish soap. Ask them what they think the result will be when more dish soap is added.