Mixing Substances

Chemistry is the science of change – what could be more exciting for a preschooler than the chemical reaction that causes two substances to bubble and fizz when mixed? By providing appropriate tools and ingredients for a mixing experiment, teachers can give their students the opportunity for some real, hands-on chemistry experimentation.

Before the activity...
- Review safety and mess-making rules.
- Use a chart to review what students already know about color mixing, and to record predictions of what they think will happen once they begin mixing ingredients.
- Introduce students to the experiment ingredients in both packaged form, and in bowls for observation.
- Review the use of any tools, such as Popsicle sticks for scooping. If students have never used pipettes, a demonstration will be helpful.

Supplies and setup for each activity
- Divided trays such as paint trays, ice trays, or plastic egg cartons
- Popsicle sticks
- Pipettes
- Ingredients to mix: water, vinegar, baking soda, dish soap
- Fizzy color tabs or food coloring
- Bowls, buckets, and a pitcher or jug for water
- Optional: smocks, goggles

Procedure
- Give each student an empty divided tray and Popsicle stick for stirring.
- Place bowls of water with pipettes, and bowls of baking soda with Popsicle sticks on the table. Invite students to scoop some baking soda into their tray, then add some water using a pipette. They can then mix with their Popsicle stick. Refer back to your prediction chart with your results.
- Add bowls of the remaining ingredients (vinegar, dish soap) to the table one at a time for students to add. Give each student one or more fizzing color tablet to add to his or her mixture. Students may then try color mixing by using a pipette to share a friend’s colored water. Provide each table with a dumping bowl so that students may start their experiments over if they wish.

Inquiry based questions
As students explore their substances and mixes, guide their curiosity by asking open-ended questions that cannot be answered with one-word answers.

- What will happen if we mix two of these colors?
- What will happen when we add water to the fizzing color tablets?
- What do you think will happen when you add the soap to your mixture?
- Why doesn’t the pipette pick up baking soda like it picks up water and vinegar?
- Can you explain to me what happened when you mixed baking soda and vinegar?

Extension activities
- After the activity, add primary colors of paint to your art area for students to broaden their color mixing experimentation. If students are interested in extending their experience with mixing colors even further, you might provide colored play dough for them to mix, ice cubes made with colored water to melt, or pieces of colored cellophane at the light table or window.
- Before or after the activity, your students might enjoy the opportunity to practice their pipette use while mixing colors. Provide students with pipettes, colored water, and a variety of absorbent and nonabsorbent materials, such as wax paper, foil, paper towels, and coffee filters. Students may use the pipettes to drip water onto the various surfaces, and collect drops of water from the nonabsorbent surfaces when finished.
- Try “Catching Rainbows” – an activity found on page 66 of the 2012 PNC-funded Teacher Created Science Resources manual.

Provided by:
Carnegie Science Center
One of the four Carnegie Museums of Pittsburgh
Mixing Substances (cont.)

Extension activities (cont.)
• Fill an empty plastic bottle with oil and water, and another with oil, water, and dish soap. Add food coloring if desired. Shake both bottles to mix, then allow both to separate. Which mixture separates faster? Based on their experience with the activity, why do students think the mixture with soap looks and acts differently than the plain oil and water mixture?
• After the activity is finished, use measuring cups and spoons to pour the used water into the sink, or buckets. How many cups of water did you use?

Resources
Books:
Mouse Paint by Ellen Stoll Walsh
Little Blue, Little Yellow by Leo Lionni
Rainbow Crow by Nancy Van Laan

Websites:
You can find several online color mixing tools by searching “color mixing” from any search engine. If you have access to a tablet, try searching for color mixing apps.