

THE CHILDREN'S MUSEUM at SARATOGA

Where learning and play go hand in hand.

Make Germs Scatter Science Experiment!

Materials:

- Water
- Bowl
- Black pepper
- Dish soap

Use a bowl of water, black pepper, and dishwashing soap to help remind your little ones why they use soap when they wash their hands.

1. First, sprinkle pepper “germs” into the bowl of water.
2. Then have your child dip their finger in soap and place it in the bowl of water.
What happened? The black pepper should have scattered.
3. Critical Thinking: So how does soap work?
Everyone’s hands have oil on them that germs like to attach to. When you wash your hands with soap, the soap breaks down the oil and the water then rinses off your hands and sends the bacteria down the drain.
4. Explain that the black pepper is not actually germs, but the experiment is to show how soap and water work together to get rid of the germs and oil on our hands.
Fun Fact: When soap is added to the water it lowers the water’s surface tension causing the molecules on the surface to pull away from the point in which the soap was added causing the black pepper sitting on the surface to scatter.

Building a Bridge Engineering Challenge

Materials:

- Blue Construction Paper (for the body of water)
- Masking Tape
- Popsicle Sticks
- Scrap Paper
- Cups/Toilet paper rolls
- Scissors
- Miscellaneous craft or recyclable materials
- Paper and pencils if they want to plan their designs

The **Engineering Design Process** is a series of steps used by engineers to come up with a solution to a problem.

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Ask: What is the problem?

Plan: Brainstorm a solution, draw it and make a list of materials

Example – What should the bridge be made out of?

Create: Make it and try it out

Evaluate: What could make it better?

Example – Do you think you could have made a better bridge out of different materials?

1. Place a blue piece of construction paper on the ground for the body of water.
2. Ask your child to brainstorm ways to build a bridge over it.
Example – How long does the bridge need to be?
Example – Will the bridge be the length of the construction paper the long way or the short way?
3. Then, have your child gather the materials they will need to construct their bridge.
Explain – The bridge must be elevated off the water. What materials do they think would be good for elevation? Cups, toilet paper rolls, etc.?
4. It's time to start building!
5. Test out the bridge by seeing how much weight it can hold.
Example – Can it hold 2 toy cars? Can it hold 3 Lego people? Is it able to hold big trucks?

Kitchen Chemists

Materials:

- Baking Soda
- Dish Soap
- Vinegar
- Glass Jar x 2
- Food Coloring
- Tray or cookie sheet to catch the ooze
- Water
- Balloon
- Water Bottle

What is chemistry? Chemistry is the science of different kinds of matter and how matter can change. One great way to learn about science is through baking. Baking, after all, is chemistry. Both chemistry and baking require careful measuring and timing. Both result in the creation of a mixture or the combination of 2 or more elements/ingredients.

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1. Ask your child what ingredients are used to bake a cake.
Eggs, milk, flour, sugar, etc.
2. Explain that the mixture of these simple ingredients transforms into a delicious dessert!
Mixtures are complex. Some mixtures can be separated back into the substances that made them.
Example – Fruit Salad what goes into a fruit salad? After you make that salad, can you pick each of those individual ingredients back out?
3. Start the experiment by placing the jar on the tray and fill it halfway with vinegar.
4. Then, have your child add a few drops of food coloring/liquid water color and a decent amount of dish soap.
5. Finally, add about a tablespoon of baking soda and wait for the chemical reaction.
6. Ask your child to observe what happens. What do they notice? How is this experiment different?

What did you learn?

7. Discuss the signs for a chemical reaction: Did the experiment with the vinegar emit a smell? Did it release any gases?
Yes! It released carbon dioxide (CO₂).

Additional Experiment: Fill a water bottle ½ cup of vinegar. Fill a balloon with baking soda (about half of the balloon). Attach the balloon to the neck of the bottle and let the baking soda fall into the water bottle. Observe how the balloon inflates. The inflation of the balloon is proof that CO₂ is being released!