Mad Scientists

Ten Science and Math Themed Activities

Suggested Morning Activities:

- **Acid or Base?**

Explain to the children: All liquids are either acidic or basic. Whether a liquid is acidic, basic, or neutral is measured by a quantity called pH. Scientists use something called the ***pH*** scale to measure the acid or base levels of a liquid. It is important to know the acidic or basic nature of a liquid because the nature of the liquid often determines its use. This activity is a quick introduction for kids to understand the concepts of acidity or basicity and their measurement. In this activity we will test various substances to determine whether they are acidic or basic, using litmus paper. Blue litmus paper turns red in acidic solutions, and red litmus paper turns blue in basic solutions.

You Will Need:

- A variety of liquid samples (ex. baking soda, vinegar, lemon juice, orange juice, tap water)
- Paper cups
- Red and blue litmus paper strips
- Data sheets or large sheets of newsprint
- Pencils

To Begin:

1. Have the children prepare data table on newsprint or distribute copies of the one such as the one attached, on which to record their results.
2. Group the students into teams and assign several substances to each team for testing. Have a team recorder enter the group's results on the board.
3. For each liquid to be tested, list its name and the reaction of a piece of red litmus and of blue litmus. Have each substance tested with both colors of paper.
4. After the substances have been tested, the students should make their own record of how each substance reacted on the Acid Test Data Sheet. Have the students classify the substances as acid, base, or neutral.

• Bubble Masters!

The purpose of this activity if for children to see how different solutions make different types of bubbles. Then overlap the different colors on sheets of paper to experiment with how colors and shapes mix!

You Will Need:

- Water
- Baby shampoo
- Package of unflavored gelatin (ex. Knox brand)
- Glycerin (you can get this at most pharmacies, all you need is a small bottle)
- Shallow baking dishes
- Bubble-blowing materials, such as drinking straws, funnels, wire hangers etc.
- Food coloring
- White sheets of paper or scene sheets

To Begin:

1. Mix your bubble solution! You can just try out one at a time, or make them all at once and compare the different solutions!
    - **All Purpose Bubble Solution**: Gently mix one part water to one part baby shampoo, and let the solution stand for a few hours. This solution is great for most bubble tricks, activities and experiments
    - **Bouncy Bubble Solution**: Dissolve one package unflavored gelatin into one cup of hot water (just boiled). Then add 1.5 - 2 ounces (50-70 ml) glycerin, and 8.5 ounces (250 ml) baby shampoo. Stir gently. The solution will gel as it cools. Reheat it carefully in the microwave (about two minutes). Bubbles made with this solution will bounce off your clothes!
    - **Thick Bubble Solution**: Mix 3 parts baby shampoo to 1 part water. When you make a bubble with this solution, try puffing at it to make a bubble inside a bubble.
    - **Colorful Bubble Solution**: Mix your choice of food coloring with the All Purpose Bubble Solution.
2. Once your solution is all mixed, put it in shallow baking dishes. Put a bunch of materials out to try a variety of different tools, and make predictions about which will blow the best bubbles. For a humongous bubble blower, thread a piece of string through two drinking straws and tie the ends together. Challenge the children to come up with their own ideas of shapes and structures.

3. Place your bubble wand in the colored bubble mix, remove and blow bubbles towards your paper or scene sheets (end of packet).
4. As the bubbles hit the paper and pop, they will leave interesting patterns. Repeat and overlap with other colors.

• Hula Hoop Times Tables

The goal of this activity is to reflect and reinforce the multiplication tables the children learned during the school year. It's a fun way of keeping kids practicing math!

You Will Need:

- Hula hoop
- Bowl or hat
- Multiplication Table sheets
- Paper
- Timer
- Scissors

To Begin:

1. Cut up the multiplication table sheet so each number category is a separate strip of paper. Fold it in half and place it in the bowl/hat.
2. One person picks a piece of paper, read the category out loud, and get ready to hula hoop. Replace the number strip back in the bowl/hat so it can be used again.
3. The hula hooper begins hooping while reciting the times table category. For example, if the hooper choose the 6 times table, then he/she would recite: 6, 12, 18, 24…
4. Another person will be a note taker, and will record the times table category and the name of the hula hooper for score-keeping purposes. This person may also record using the timer how long the hooper keeps hula hooping while reciting numbers.
5. The hooper is done when the hoop falls to the ground or the hooper cannot come up with any more number products.
6. Continue rotating through the group so everyone has a turn being the hooper and the recorder. If a player chooses a number they have already done, replace the strip and draw another.

• Sight Word Island Hopping

This activity is a fun and active way to rehearse the words learned in school. The children will follow patterns and piece together words in a safe path back to Shelter Island! Some of the common First Grade sight words include: the, you, she, said, that, do, for, they, be, boy, go, little, was, by, into, his, had, like, him, her, as, this, with, what, out, then, came, come, when, some, girl, have, there, about, from, who, work, make, them, children, an, around, long, once, saw, eat, away, how, name, new, over.

You Will Need:

- Colored chalk
- Stretch of pavement
- A few index cards
- Permanent marker
- Stopwatch

To Begin:

1. On one end of a paved surface, use the chalk to draw a circle big enough for a few kids to stand comfortably inside. For fun, the kids may decorate this circle as they wish. This circle will be "Shelter Island" and will be the home base.
2. Surrounding "Shelter Island" is "Crocodile Sea" with the fearsome, snapping toothy jaws of crocodiles all around!
3. Now draw a series of smaller circles from "Shelter Island" to the other end of the pavement. Leave about a foot of space between each circle and spread them out so there are multiple routes to "Shelter Island." Each of these circles is an island that will help guide the children to safety. The goal of this game is for each child to hop across each island to land safely on "Shelter Island."
4. On each little island, have the children write a word they learned in school. They may decorate the island as they wish.
5. Now on the index cards, write out different routes of about 4-5 words using the words written on the little islands.
6. Pull out a card, call a route, and let the children race to get to "Shelter Island."

• Aircraft Marshalling Game

Let the children experience the feel of being an important member of the ground personnel who help guide traffic at the airports! This activity allows the children to

create directional devices using simple materials, learn signals, geometry, and practice following directions!

You Will Need:

- Orange construction paper
- Tape or glue
- Aircraft marshalling signaling sheets

To Begin:

1. Roll the construction paper into tubes and tape (or glue) them so they stay.
2. Review the aircraft marshalling signals sheet. These are real signals used at airports!
3. Using the construction paper tubes, practice the signals.
4. Then, pair up and one child will be the aircraft marshal and one child will be the airplane. The person playing the airplane will follow the directions given by the aircraft marshal. Using the landscape, trees/sidewalk/etc., have the aircraft marshal direct the airplane person around and through a series of obstacles. Then switch roles so each child practices giving directions as the aircraft marshal and following directions as the airplane.
5. With a large group of children, the tubes can be used in a simple Simon Says game.

Suggested Afternoon Activities:

• **Alka-Seltzer Rockets**

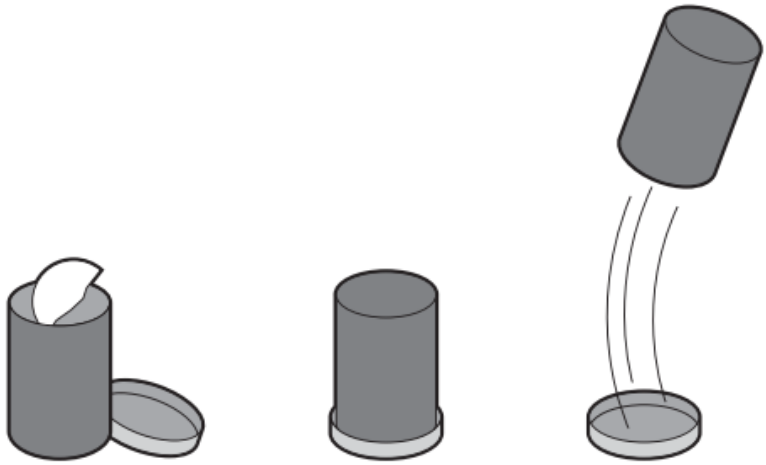
This activity requires supervision and should be done in small groups. This activity shows the buildup of pressure from the release of gas in a closed container.

You Will Need:

- Empty 35mm plastic film canisters and lids. These are getting harder to find, but stores that develop film should have some. (The white canisters work much better than the black ones do.)
- Antacid tablet (such as Alka-Seltzer)
- Water
- Safety goggles
- Duct tape (optional)
- Manila paper (optional)

To Begin:

1. Put on safety goggles
2. Staff break the antacid tablet in half, quarters, or thirds.
3. Remove the lid from the film canister and put a teaspoon (5 ml) of water into the canister.
4. Do the next 2 steps quickly
    - Drop the tablet half into the canister and snap the cap onto the canister (make sure that it snaps on tightly.)
    - Quickly put the canister on the ground CAP SIDE DOWN and STEP BACK at least 6 feet.



5. About 10 seconds later, you will hear a POP! and the film canister will launch into the air!
6. 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 buildup of gas leaked out.
7. Variations (optional):
    - Does the size of the tablet piece affect how long it takes for the rocket to launch?
    - Can the flight path be controlled by adding fins or a nosecone to the canister?
    - How much water in the canister will give the highest flight?
    - How much water will give the quickest launch?

• Constellations

The purpose of this activity is to introduce children to the idea of constellations. Constellations are grouping of *stars* that people can imagine form a particular *figure* or *design. In the United States these are often named after characters from classical Greek and Roman mythology* as *well* as *various common animals and objects. However,* star constellations can differently by people from different countries, or even different parts of the same country.

You Will Need:

- Sidewalk chalk
- Flat pavement to draw
- Pictures of constellations

To Begin:

1. Review the constellation sheets and their names.
2. Have each child choose a constellation and draw it with chalk. Don't forget to label it!
3. For fun, have the children create a new name for the constellations based on what they think it looks like.
4. Then, thinking about people/animals/places/sports/etc. the children want to commemorate, have them create their own constellations and name them.

• Straw Structures

This activity will introduce children to dimensional structures. Using the materials provided, they can create and build their own structures!

You Will Need:

- Bendable straws
- Pipe cleaners
- Tape (optional)
- Scissors (optional)

To Begin:

1. Using straws, squeeze one end of one straw flat and push it inside the end of another straw.
2. Using pipe cleaners, connect various shapes built from the straws. Connect triangles, squares, rectangles, to build higher and more complex structures.

3. If needed, use tape to secure the straws in place. Use scissors to cut the pipe cleaners to desired lengths.

• Hula Hoop Math Toss

This activity will help kids practice simple math equations in a fun and interactive way.

You Will Need:

- Hula hoops
- Water balloons
- Paper
- Marker
- Math equations
- Basket/hat

To Begin:

1. Lay out the hula hoops and prepare water balloons.
2. Assign a different child a number from 1-9 and have them stand in a hoop. They may display the number on a sheet of paper if they wish.
3. Cut up the math equations and put them in a basket/hat.
4. Have the remaining children pick a math equation, and answer it by throwing a water balloon at the person/hoop of the answer. The person in the hoop may try to catch it or let it hit the ground and splash them.
5. Rotate among the children standing in the hoops and the children answering math questions so everyone has a turn.

• Chromatography

Inks, dyes, and other colored solutions are generally made up of a mixture of different colors. As the children will see, the color black contains many different colors. The purpose of this activity is to introduce children to the concept of chromatography, the process by which inks, dyes, and other colored solutions are broken down into their component.

You Will Need:

- Chromatography paper, coffee filter paper, or paper towel
- Cups
- Non-permanent black Markers or felt tip pens in black or non-primary

- Water
- Scissors
- Tape
- Pencils

To Begin:

1. Cut strips of filter paper about half an inch wide.
2. Using the markers, draw a big dot about half an inch from the bottom of the strip. Do the same thing on different strips for each marker you want to test.
3. Tape the strip to a pencil so when it the pencil rests across the cup, the paper

hangs down inside.

4. Fill the cup with water until it just touches the bottom of the paper. Leave the paper alone in the cup and watch as the water travels up the paper drawing out the colors from the dot!
5. Explanation: as the water runs up the paper, it draws the colors with it. Come of the components of the ink travel faster than others causing the different colors to spread out.
6. How many colors do you see? Do the colors change based on the marker?