

Science Fun for Everyone

Project STEM Starters

Ten fun science activities for parents and children



Complete this booklet and return the ten attached Experiment Reports to your teacher before Spring Break for a free Mad Scientist T-shirt.

Instructions:

- Before beginning each activity, complete the hypothesis by circling your prediction (the words in bold).
- Do each activity and complete the **Experiment Reports**.
- When finished, bring the completed and signed **Experiment Reports** to your teacher.
- Keep the activity sheets for your future use.

DO ACTIVITIES WITH CAUTION AND ONLY IN THE PRESENCE OF A PARENT OR GUARDIAN.

Experiment 1

Title: Mystery Reaction

Problem: How does soap act in the presence of pepper and water.

Hypothesis: When we add soap to a container of water and pepper, the pepper will:

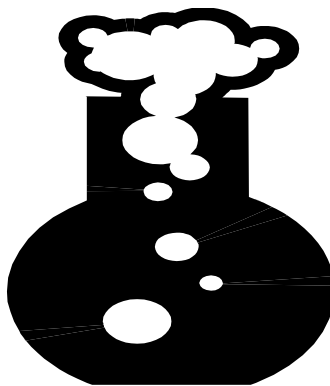
1. Spread apart
or
2. Stay together

Materials: cup, water, pepper, liquid soap, eyedropper

Procedure:

1. Fill a cup half full of water.
2. Sprinkle pepper on the water's surface and observe what the pepper does.
3. Add a drop of soap to the middle of the water and observe.

Conclusion: What happened to the pepper?



Experiment 2

Title: Lets Make Music

Problem: What causes sound to change?

Hypothesis: By increasing or decreasing the length of a ruler that hangs off a table, the sound **will or will not** change.

Materials: plastic ruler

Procedure:

1. Place the ruler on the edge of a table so that half of it hangs off.
2. Hold the end of the ruler flat against the table with one hand. With the other hand, lightly snap the end of the ruler that hangs off the table. Listen to the sound.
3. Push the ruler back, so that less of the ruler hangs off the table. Repeat step two and listen to the sound.
4. Push the ruler so that most of it hangs off the table. Repeat step 2 and listen to the sound.

Results:

Length	How sound changed
shorter	
longer	

Experiment 3

Title: Finding Meteorites

Problem: Can we make a meteorite finder that will find meteorites in our yard?

Hypothesis: Meteorites are (a) found or (b) not found in our yard.

Materials: paper cup, pencil, string, magnet

Procedure:

1. Poke three holes into the cup just below the rim.
2. Thread the string through each hole, leaving the string long enough to reach from a child's hand to the floor.
3. Tie knots to hold the strings in the cup, then pull the strings above the cup and tie.
4. Place a magnet in the cup.
5. Take the meteorite finder outside and walk on the sidewalk holding the meteorite finder just above the ground.
6. Listen for small clinks.
7. Pieces of rock the magnet attracts might just be meteorites, because these rocks contain iron and nickel like meteorites.

Conclusion: Did you find any meteorites?



Experiment 4

Title: Is the Earth Moving?

Problem: How do you know the earth is moving?

Hypothesis: The Earth will (a) move or (b) not move in one hour.

Materials: pencil, piece of clay, ruler or stick, large sheet of white paper, 4 large rocks

Procedure:

1. Go outside on a sunny morning.
2. Put the paper on a flat surface like a sidewalk.
3. Pick a place where the Sun will shine on the paper all day.
4. Hold the paper down with rocks.
5. Roll the clay into a ball and place it in the middle of the paper.
6. Push the ruler into the middle of the clay so that it stands straight up.
7. Draw the shadow of the ruler and write the time next to the shadow.
8. Do this once an hour until sundown.

Conclusion:

1. Did the shadow change? How?
2. Why did the shadow change?
3. The Sun does not really move across the sky. It just appears to move. What is really moving?

Experiment 5

Title: Static Electricity

Problem: When an object is rubbed, it sometimes gains an electric charge. These charges do not move in the object and are said to be “static”. An object with static electricity can either attract or repel other objects. Can we cause a balloon to have static electricity?

Hypothesis: Rubbing a balloon will or will not cause it to have static electricity.

Materials: 2 balloons, string, and small, lightweight objects such as salt, tiny pieces of paper, cereal.

Procedure:

1. Blow up and tie one balloon.
2. Rub the balloon against your hair and try to stick it to the wall. Observe what happens.
3. Rub the balloon on your hair again and try to pick up the objects. Observe what happens.
4. Blow up and tie the other balloon. Attach string to both balloons and hang them close together. Observe what happens.



Experiment 6

Title: Silly Putty!!!

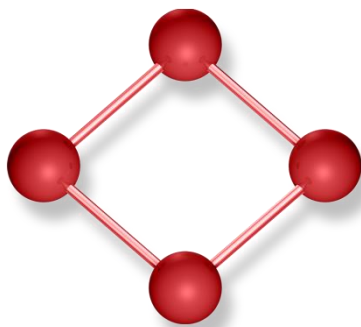
Problem: Silly putty is a type of polymer, which is a long chain of molecules. Can we make silly putty with common household ingredients?

Hypothesis: We can or cannot create a polymer by mixing white glue and liquid starch together.

Materials: white glue, liquid starch (found in the laundry section of grocery store), bowl, spoon, measuring cup

Procedure:

1. Mix $\frac{1}{2}$ cup of white glue and $\frac{1}{2}$ cup of liquid starch to a bowl.
2. Mix slowly together with a spoon.
3. When the mixture thickens, hold it in your hand and knead it.
4. The putty will be wet and sticky at first. Keep working with it and it will get better.
5. When it stops sticking to your fingers, it is ready!
6. Store putty in an airtight container to keep.



Experiment 7

Title: What color pigments are present in your markers?

Problem: Is there more than one color in a black marker?

Hypothesis: A black marker is made of one or more than one color.

Materials: black marker (not permanent), paper towel or coffee filter

Procedure:

- Cut a paper towel or coffee filter into strips about one inch wide.
- Draw a squiggly line across a strip of paper with the marker about an inch from the bottom.
- Hang the strip over a cup or bowl of water. The water should touch the very end of the paper, but not the ink.
- Tape the paper in place and wait to see what happens. The water should creep up the paper and separate the ink mark into to a cool dye pattern. This is called Chromatography.
- Try different black markers and different colored markers to compare and contrast.

Conclusion:

What colors were found in your markers?



Experiment 8

Title: Catch Some Rays

Problem: Does water or soil get hotter in the sunlight?

Hypothesis: I predict **water or soil** will get hotter in the sunlight.

Materials: thermometer, 2 aluminum pie pans: 1 filled with water and 1 filled with soil

Procedure:

1. Measure the temperature of the water and soil.
2. Place the pans with water and soil in a sunny spot.
3. Measure the temperature of the water and soil after 1 hour and after 3 hours.

Results:

Time	Temperature
Beginning	
1 hour	
3 hours	

Extension:

Leave pans outside overnight and measure the morning temperature. Which pan had the greatest change in temperature?

Experiment 9

Title: Balloon Blow Up

Problem: When a chemical reaction occurs between two substances a gas can be released. Can enough gas be released to blow up a balloon when reacting vinegar and baking soda.

Hypothesis: We can or cannot create enough gas to blow up a balloon by mixing vinegar and baking soda.

Materials: balloon, empty 2 liter soda bottle, 1 tablespoon of baking soda, 1 cup of vinegar

Procedure:

1. Add a tablespoon of baking soda to a balloon very carefully.
2. Add a cup of vinegar to soda bottle.
3. Attach the balloon to the soda bottle without letting any baking soda get into the bottle. **CAREFUL OR YOUR REACTION WILL TAKE PLACE BEFORE YOU ARE READY.**
4. When balloon is attached, carefully lift the balloon and dump baking soda into the bottle.
5. Set back and watch the fun.

Conclusion:

Evidence of chemical reactions can involve a gas being produced and a temperature change. What do you notice about the temperature of the bottle?

Experiment 10:

Title: Seeds, seeds and more seeds

Problem: What can grow out of a sock?

Hypothesis: We can or cannot get plants to grow from a sock filled with seeds?

Materials: old fuzzy sock, shoebox, garbage bag or plastic wrap, potting soil, scissors

Procedure:

1. Put old sock over your shoe and wander around outside in an area where plants are growing.
2. When you finish, take the sock off and examine the kinds of seeds that are stuck to the sock.
3. Now, to plant your sock—line a shoebox with a garbage bag or plastic wrap.
4. Fill the shoebox with potting soil.
5. Cut a slit down the side of your sock.
6. Then flatten you sock and plant it with the seeds pointing up. Cover it with a thin layer of soil and add enough water to make it moist but not too wet.
7. In a week or so, the seed should begin to sprout.



My Experiment Report #1

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #2

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #3

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #4

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #5

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #6

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #7

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #8

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #9

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____

My Experiment Report #10

By: _____

What I did:

What I observed:

Student Signature: _____

Parent Signature: _____

Date Completed: _____