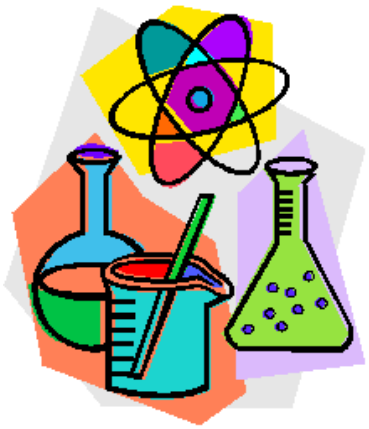
bookspring **Presents:**

Mad Scientist Club

Goal: Motivate students to read and explore science through books and experiments.

BookSpring will provide:

Read Aloud envelope and Read Aloud selections
Model/Demonstration/Experiment posters
Lab coat(s)
Safety Glasses
Plastic Tablecloths
Materials for Science Demonstrations (listed individually per activity)



Description of Activity:

1. When the children enter the library, greet them dressed as a scientist. Choose one of the possible activities to motivate students, based on their age level. (See pages 3 and 4)

2. *Possible Activities:*

- Rose Colored Glasses (mixing color) — Physical Science (PK-1)
- Chemical or Physical? — Physical Science (PK-1)
- Drinking Candle — Physical Science (2nd-5th)
- Chemical or Physical? — Physical Science (2nd-5th)

3. Read the read-aloud selection.

4. Invite students to walk over to the book tables. As they look at the books, remind them where the science books are in the library and encourage them to keep learning by reading and doing!

Tech Connection: There is an excellent short video (6 minutes) about William KamKwamba at **http://movingwindmills.org/documentary**. It is appropriate for 3rd-5th grade students and shows a live interview with William. Another great source for exciting science content for younger children is "5 Fun Science Experiments for Kids with Grover" on **www.youtube.com**.

Texas Essential Knowledge and Skills: K(21 A&B); 1st (27A&B); 2nd (28A&B); 3rd (110.14 29A); 4th (110.6 b1A,C &b3A); 5th (110.7 b1A &b3A &b8A,B,C)
Common Core: ELA-Literacy. RL.K 10, Sl.K.1a-K.2, 1.1a-c, 1.2, 1.3, 2.1a-c, 2.2, 2.3, 3.1a-d, 4.3, 4.4, 4.1d, 4.6, RF 4.4a-cSl 4.2, Sl 5.3, 5.6, Rl5.2, 5.8, 5.10

Suggested Read-Aloud Books

Grade Level: **Pre-Kinder through Second Grade**	**Suggested Read-Aloud:** What is a Scientist? and 11 Experiments That Failed

Discussion Points:

1. Begin with **What is a Scientist?** Prior to reading, activate students prior knowledge by asking them what they know a scientist does. List on chart paper or white board.
2. Read the book aloud, confirming what the students had told you they knew. Stop to talk about any of the descriptors the students had not mentioned.
3. In between the two books, let the children know that a scientist learns about the world by observing and experimenting. Scientists to have to be reasonable though and follow safety procedures!
4. Read **11 Experiments that Failed.** Make sure to ask students for each experiment:
   1) What do you think will happen in this experiment?
   2) What could you do differently to make this experiment work?
   3) How do you think her mother will react to this experiment?
5. After Reading:
   1) Which experiment in the book was your favorite? Why?
   2) Have you ever done an experiment before? What was it? What did you learn?
   3) Have you ever failed at something before? What did you do in response?

Grade Level: **Second through Fifth Grade**	**Suggested Read-Aloud(s):** The Boy Who Harnessed the Wind and/or 11 Experiments that Failed

Discussion Points:

1. The Boy who Harnessed the Wind, ask "Based on the cover illustration, explain what you think the title means.
2. Have them look at the first page and ask what the living situation is like in Malawi?
3. Talk about a windmill and ask if the students have ever seen one. Can they tell you what purpose it serves? Explain that when the wind moves the blades of the windmill, it produces energy, which can be used to do different types of work.
4. Locate Malawi on the map. Read the story. Some vocabulary words it might be helpful to talk through are: harnessed, maize, drought and recycle.
5. After the book: What challenges did William face? What would your life be like without electricity?

6.Read **11 Experiments that Failed.**
   1) Which experiment in the book was your favorite? Why?
   2) Have you ever done an experiment before? What was it? What did you learn?
   3) Have you ever failed at something before? What did you do in response?

7. Discuss how learning happens even when (or especially when) something happens that we didn't expect.

Rose Colored Glasses

What you need:

Premade glasses that accept colored discs.
Colored discs: red, yellow and green

How to: **Splitting Light**

1. Start by placing on lens of the same color (either yellow, blue or red) in each frame.
2. Place the glasses over your eyes (a students eyes) to see the world in a single vivid color.
3. Time to mix: This time, place one blue and one yellow lens in each frame. Look to see what new color blue and yellow make.
4. **What's happening?** Primary colors mix to make new colors.

Shake it Up!

What you need:

Plastic “test tubes” with lids, Water, food coloring

How to:

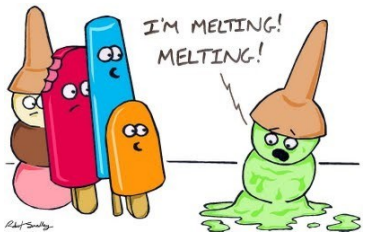
1. Fill two test tubes nearly to the top with water. Set aside the third test tube.
2. Add three drops of red food coloring to one test tube and three drops of blue food coloring to the other test tube.
3. Put the lids on the test tubes and shake well. Remove the lids.
4. Fill the dropper with red water and squirt it into the third test tube. Do the same with the blue water. Put the lid on and shake. Which secondary color did you get by mixing red and blue?
5. Continue testing out new color mixtures. Try red with yellow, blue with yellow and other combinations. Have fun!

What's happening? Red, yellow and blue are primary colors. Red mixed with blue makes purple, a secondary color. Red mixed with yellow makes orange. Yellow mixed with blue makes green.

Excerpt from: Learning Resources Color Mixing Kit.

Chemical or Physical? (PK-1)

Background information:



A **physical change**, which is a substance changing physical forms but still retains its original properties.

An example of a **physical change** is:

- Cutting a piece of paper with scissors
- melting of ice cream
- boiling water

A **chemical change** is when 2 substances are mixed together to form something new.

There are 4 main clues that a chemical change has occurred.

1. There is a formation of **gas** which can be seen by a **fizzing or bubbling.**
2. The reaction will cause **heat, light or odor** to be seen or felt.

3./4. A **color** change is produced or a **solid** is formed during the change.

Can you tell if the following demonstrations show a physical or chemical change?

What you need:

Bubbles straw plastic plate ice cube popsicle sticks bleach

q-tips construction paper plastic tablecloth goggles gloves

How to:

There are 4 demonstrations:

1. Pour some bubbles on to the plastic plate. Blow bubbles through the straw, or have a student blow. Talk about the change to the bubble solution. Was it physical or chemical change?

2. Get an ice cube and set it on a piece of construction paper on the plastic tablecloth. Set a timer for 3 minutes. Watch the ice and describe what is happening. Is it a physical or chemical change?

3. Put on some latex gloves and goggles. Dip a q-tip into a capful of bleach. Use the q-tip to draw a simple picture on the construction paper. What change did you observe? Was it a chemical or physical change?

4. Pick up a couple popsicle sticks. Break the, into as many pieces as you can. Let the stu dents help with this. When finished—set the sticks on the table. What process did the sticks just go through? Physical or chemical? Why?

Adapted from: http://sadie423.hubpages.com/hub/hands-on-experiments-to-learn-about-chemistry

Drinking candle?

What you need:

Water	Saucer or shallow bowl
Tea light or small candle	Lighter or match
Glass	Food coloring (optional)
Plastic tablecloth	Paper towels

How to:

Make sure you carry out the experiment away from flammable materials.

1. Pour water into the saucer or bowl to around 1cm deep. Adding a couple of drops of food coloring will make the water easier to see.
2. Place the tea light or small candle in the center of the bowl, making sure that the wick doesn't get wet.
3. Use the lighter or match to light the candle.
4. Turn the glass upside down and place it over the candle.

What happens to the water?

What's happening? (air pressure)

When the candle burns inside the glass, the air inside the glass gets warmer.

Warm air takes up more space than cool air. The air inside the glass pushes against the glass. Expansion of the warm air causes the air pressure inside the glass to increase.

Air wants to move from an area of high pressure to an area of low pressure. The air inside the glass tries to escape to the lower pressure air outside the glass. **You can see little bubbles in the water around the bottom of the glass.**

The candle needs oxygen to burn. It soon uses all the oxygen inside the glass. When the oxygen runs out, the candle stops burning.

Now the candle is out, the air inside the glass cools down again. **The air pressure inside the glass is now lower than the air outside the glass.**

Some of the higher pressure air outside the glass tries to get to the lower pressure air inside the glass. **This forces water into the glass.**

When water enters the glass, the space for air inside the glass is smaller. This cause the air pressure to rise.

The water keeps going into the glass until the air pressure inside the glass is the same as the air pressure outside the glass.

Adapted from: http://www.teach-nology.com/worksheets/science/chem/lab5/

Chemical or Physical? (2nd-5th)

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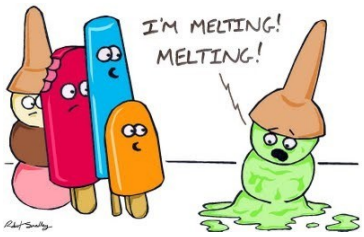

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Demonstrate that a chemical reaction has occurred by observing the formation of a gas.

What you need:

A bottle **vinegar** **baking soda** **a balloon** **a funnel**

How to:

1. Place a small amount (1 tablespoon) of baking soda in the balloon using the funnel.
2. Pour vinegar into the bottle so it is about 1/4 full. Very carefully stretch the balloon around the top of the bottle, making sure you keep the balloon down so that the baking soda doesn't fall into the bottle just yet.
3. Tip the balloon up to allow the baking soda to drop into the bottle. Make sure to hold the base and top of the balloon so that it doesn't come off.
4. Once they have observed the reaction, ask questions. What type of reaction occurred? How do they know? What is inside the balloon?

What's happening?

A chemical change occurred because the two substances that were mixed together formed a gas. The gas blew up the balloon.

Would you like to show a very impressive chemical change?

Watch this youtube video of Jimmy Kimmel and Science Bob making “elephant toothpaste.” You will see a reaction that creates heat and produces a solid.

Here is the link: https://youtu.be/p1eG2y2mn54

Adapted from: http://sadie423.hubpages.com/hub/hands-on-experiments-to-learn-about-chemistry