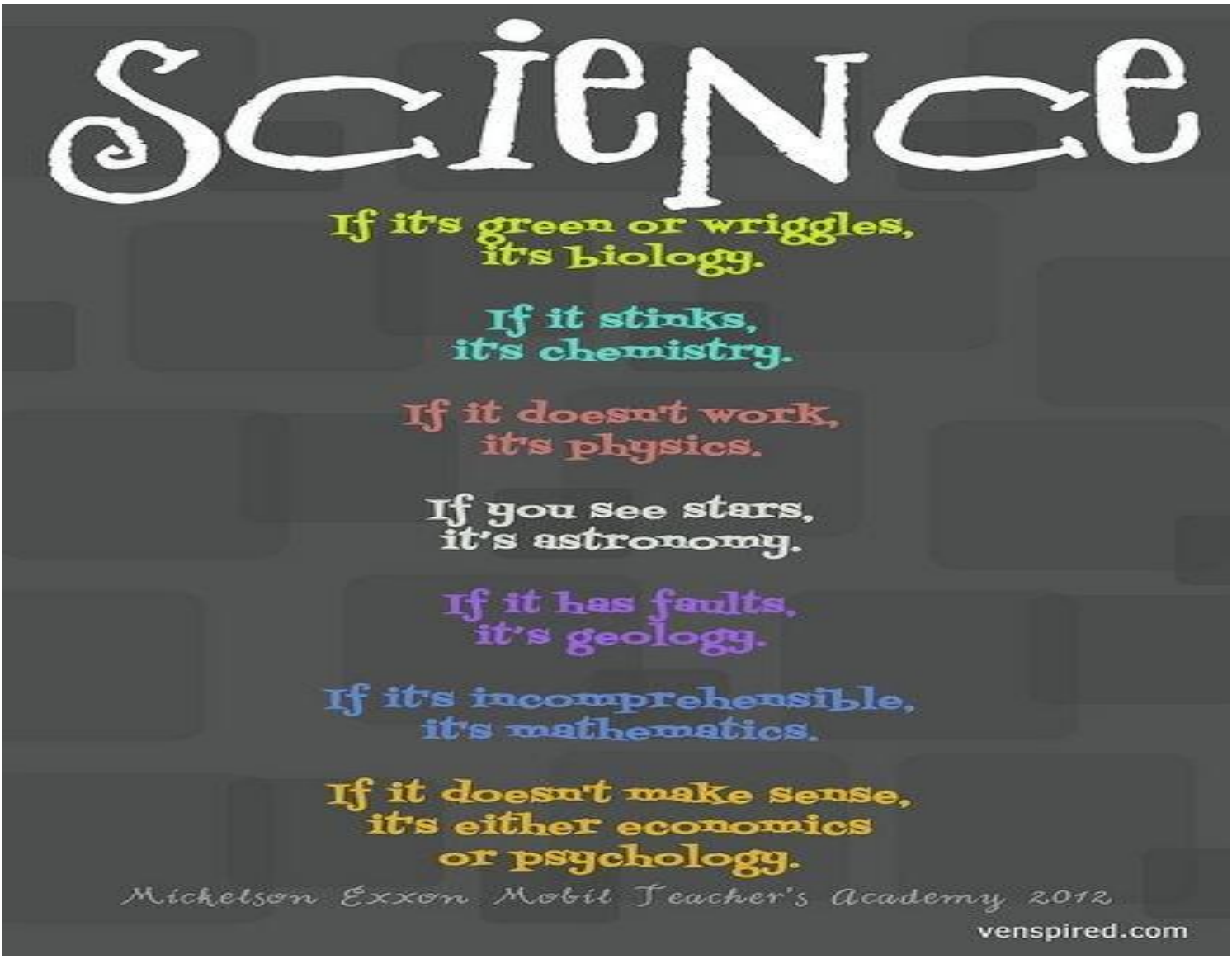
GRADE FOUR
ACADEMIC YEAR 2022-23
SCIENCE

ATTENTION SOON TO BE GRADE 5 SCIENTISTS
ARE YOU READY TO MIX UP SOME POTIONS AND CREATE MAGIC?
ENTER THE WORLD OF SCIENCE AT YOUR OWN RISK
THERE ARE SOME ACTIVITIES AND EXPERIMENTS WAITING FOR YOU
LET'S GET STARTED!



1. Mini Marshmallow Launcher

Learn how to make a fun little mini marshmallow launcher with this super easy motion science experiment.

Materials:

- Pool noodle
- Balloon
- Scissors
- Mini marshmallows
- Masking tape

Instructions:

1. Use the scissors to carefully cut an approximately 3-inch piece from one end of the pool noodle.
2. Tie a knot in the balloon as if you had just blown it up.
3. Cut the top end off of the balloon.
4. Stretch the balloon over the piece of pool noodle. Center the knot over the hole in the center of the pool noodle.
5. Once centered, use the tape to secure the balloon in place.
6. Put a mini marshmallow into the launcher.
7. Pull back the knot and launch the mini marshmallow.

8. Set up some targets and have fun playing with your Mini Marshmallow Launcher

How it Works:

The balloon is elastic and will stretch easily. When you pull the balloon, and let it go, the balloon will return to its original shape. While doing so, it will carry the mini marshmallow with it and send it flying through the pool noodle.

Make This A Science Project:

Use different sized balloons or other elastic material to see if the distance the mini marshmallow goes increases or decreases. Try different sized tubes. Try different sized marshmallows.

2. Super Sound Popper

Learn how to make a fun and easy super sound popper in this sound science experiment.

Materials:

- Cardboard tube
- Balloon
- Scissors
- Masking tape

Instructions:

1. Tie a knot in the neck of the balloon as if you were trying to keep air inside.
2. Use the scissors to snip the other end off of the balloon.
3. Stretch the balloon over one end of the cardboard tube. Center the knot over the opening in the cardboard tube.
4. Use the masking tape to secure the balloon in place.
5. Pull back the knot and release to use your Super Sound Popper.

How it Works:

The balloon is elastic. When pulled back and released, it will return to its original shape. While doing so, this makes a popping noise that is amplified (made louder) by the cardboard tube.

Make This A Science Project:

Do different sized balloons or other elastic material change the volume or sound created by the Super Sound Popper? Do different sized tubes change the volume or sound? Does the length of the tube change the sound in any way

3. Friction Fun

Have fun exploring friction with this easy science experiment. All you need is a clear plastic bottle, a bag of rice, a pencil, and a funnel.

Materials:

- Clear plastic bottle
- Funnel
- Rice
- Pencil

Instructions:

1. Place the funnel in the bottle.
2. Fill the bottle all the way with the rice.
3. Insert the pencil straight down into the bottle.
4. Try to lift the pencil.
5. If your pencil slips free, gently tap the bottle on a table to settle the rice around the pencil.

How it Works:

The friction between the rice grains and pencil become so strong that you can lift the bottle without the pencil slipping free.

Make This A Science Project:

Try different items in the bottle to see if the friction is strong enough to hold onto the pencil. Try different sized bottles. Try items other than pencils in the bottle to see if they work.

4. How To Cast An Animal Track

In this fun, quick, and easy science experiment you will learn how to cast an animal track. On your quest to become an animal detective, you will learn how to use a few easily available inexpensive materials to make casts of animal tracks to keep, enjoy, and show to your friends. Future biologists, veterinarians, and any adventurer that loves the outdoors will enjoy learning how to cast an animal track.

Materials:

- Two liters plastic soda bottle
- Scissors
- Plaster of Paris
- Newspaper

Instructions:

1. Cut the top and bottom off of the two liters soda bottom.
2. Next, cut the remaining soda bottle into two inch sections. You will end up with several rings.
3. Locate a distinctive animal track that you want to keep.
4. Clear away any debris like leaves or sticks.
5. Take one of your plastic rings and place it around the track making sure the track is in the center of the circle.
6. Push the ring about ½ inch into the ground.

7. Mix the Plaster of Paris according to the package directions.
8. Pour the plaster into the plastic ring.
9. Allow to set for one hour.
10. Dig around the plastic ring and then work your way under the plaster cast.
11. Once you think you can safely lift the cast, do so gently and place it in several sheets of newspaper.
12. Carefully and securely wrap the cast in newspaper.
13. Let the cast sit for several days before cleaning it up and observing the animal track you have captured.

How it Works:

When you pour the Plaster of Paris into the animal track, it hardens and creates a perfect cast of the animal track. You can even paint the cast of the animal track once it has hardened.

Make This A Science Project:

Identify an area that has high levels of animal traffic. Use your knowledge of casting animal tracks to capture casts and bring them home to study and identify the types of animals visiting the area under investigation. Do the types of animals visiting the area change at different times of the year? Do conditions such as more or less water change the type or volume of animals visiting the site?

5.Giant Fingerprint

Fingerprints are very small and hard to explore and investigate. In this fun little science experiment, you will use a balloon to expand your fingerprint to gigantic proportions so you can see the arches, whirls, loops and more.

Materials:

- Balloon
- Ink pad

Instructions:

1. Stretch your balloon several times so it is easy to blowup.
2. Lay the balloon on the table and flatten an area big enough to fit a fingerprint making sure there are no creases in the balloon.
3. Press your finger into the ink.
4. Now press your inked finger onto the balloon.
5. Gently roll your finger to capture your entire fingerprint.
6. Blow up the balloon and tie it off.
7. Enjoy inspecting your Giant Fingerprint.

How it Works:

When the balloon inflates, the image of your fingerprint stretches out and grows. This allows an opportunity to inspect your fingerprint.

Make This A Science Project:

Can you imprint other things on the balloon that enlarge in the same way as the fingerprint? Do other types of paints act in the same way as the ink?

6.Build Your Own Balance Buddy

In this fun, quick, and easy science experiment you will learn how to build your own little Balance Buddy to hang out with and observe the laws of gravity. All you need are a few readily available items and you'll soon have a wobbling friend that seems to magically stay balanced on the tip of your finger.

Materials:

Popsicle stick

- Pipe cleaner
- 2 – Clothespins
- Optional – Markers, googly eyes, etc

Instructions:

1. Center the pipe cleaner across one end of the popsicle stick.
2. Twist the pipe cleaner in a way that it will not slip off of the popsicle stick. Make sure the pipe cleaner is the same length on either side of the popsicle stick.
3. Attach one clothespin to each end of the pipe cleaner.
4. Test your Balance Buddy by placing it on the tip of your finger.
5. Optional – you can draw a face and decorate your Balance Buddy.

How it Works:

By adding the clothespins to the pipe cleaner, you move the popsicle's center of mass to the bottom of the popsicle stick.

Make This A Science Project: Use a larger stick. Try longer pipe cleaners. Try different items for weights or use more than one clothespin on each end of the pipe cleaner.

7.Crazy Kazoo

Materials:

- Toilet paper roll
- Wax paper
- Rubber band

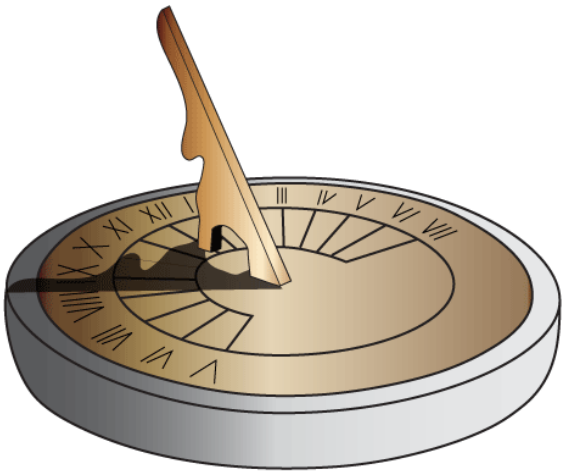
Instructions:

1. Cut or tear a piece of wax paper big enough to cover the end of the toilet paper roll.
2. Use the rubber band to secure the wax paper over the end of the toilet paper roll.
3. Hum into your Crazy Kazoo and enjoy the cool and unique sound.
4. Practice humming songs with your Crazy Kazoo.

How it Works:

The wax paper vibrates as you hum in the Crazy Kazoo to produce a cool buzzing sound.

8.Sun Dial



Materials:

- Straight stick about two feet long
- small rocks or small seashells
- a watch
- chalk (optional)
- Sand (optional)
- Bucket (optional)

Instructions:

1. Find a sunny spot and push the stick vertically straight into the grass or earth. If your backyard doesn't have any grass or earth, fill a small bucket with sand and place your stick into the bucket.
2. Start in the morning when the sun is up. At 7:00 am use a small rock or seashell to mark where the shadow of your stick falls. Come back at 8:00am, 9:00am, 10:00am, and so on until there is no more

daylight in the day. You may want to mark your pebbles with the time they were placed using chalk.
3. By the end of the day your sundial will be complete.

How it Works:

The sun’s light will make your long stick cast a shadow. The shadow will change it’s angle depending how the sun’s light is hitting the stick because our earth is constantly rotating and revolving around the sun.

Extra Experiments:

1. Measure how long the shadow that is casted by the stick is. Measure it in winter and spring. Are the measurements differnt? Which season has the longer shadow?
2. Make a second sun dial after we reset our clocks each year. How are the two sundials similar? How are they different?

9.Balloon Speakers

Materials:

- 1 Balloon

Instructions:

1. Blow up the balloon so that it is filled with air
2. Hold the balloon up to your ear.
3. Lightly tap the other side of the balloon with your finger. Can you hear the sound well? Can you feel the vibrations?
4. Now let go of the balloon. Which way does the air escape? Which direction does the balloon move in?

How it Works:

When you blow into the balloon you are pushing air molecules into the balloon. They are forced into a small area so are very close together. These circumstances allow the air molecules to carry the sound waves better. That is why you can hear the tapping so easily. It’s as if you built a speaker.

Extra Experiments:

1. Add mini marshmallows to the balloon. Does it muffle the sound? Does it sound the same?
2. If you have access to a helium tank, fill the balloon up with that instead. Is helium a better conductor of sound then the air that you pushed into the balloon?
3. Can you hear different pitches based on how big or small the balloon is? Give it a try!

10. Blossoming Beans

Materials:

- 1 pinto bean
- 1 Ziploc bag
- 1 paper towel
- Spray bottle for holding water

Instructions

1. Dampen paper towel with spray bottle
2. Place wet paper towel in Ziploc Bag
3. Place bean on top of wet paper towel
4. Close Ziploc Bag
5. Place Ziploc Bag in a warm, sunny spot
6. Add water to paper towel when it dries out
7. Observe your plant growing in 3-5 days!

How it Works:

What's going on? Germination! That means the plant is sprouting its roots. Awesome! Usually, you can't see the roots sprout when the seed is under soil, but since there is no soil in this experiment you can see the whole process.

Extra Experiments:

1. Prepare two bean plants, but put one in a sunny area and one in a dark area. Observe their similarities and differences and chart them down.
2. Chart your bean plant's growth each day using a ruler.
3. After 2 weeks, move your bean plant to some soil. Don't forget to water it and give it some sun!

11. Pot of Gold

Materials:

- Bag of chocolate coins
- Paper plates
- Pen
- Paper
- A watch, clock, or timer
- A clear plastic cup
- Black construction paper or black marker

Instructions:

1. Take the foil off of each chocolate coin you use for the experiment.
2. Place each chocolate coin on a separate paper plate.
3. Place paper plates in different spots, for example, one outside in the shade, one outside in the sun, one inside in a dark room, or one inside under a lamp.

   At each location, place up to 3 plates to see which melts the fastest:

- 1 white paper plate with just the chocolate coin

- 1 white paper plate, with a clear plastic cup over it, covering the coin to allow it to trap some heat
- 1 paper plate, with a black piece of construction paper, or color the plate black with a marker, to see if this absorbs more heat

4. Using your time keeping device, pen, and paper, record how long it takes the chocolate to melt in each situation. If it doesn't melt after 10 min of sitting, record that as well.
5. Compare your results and think about the conclusion to your results.

How it Works:

At a certain temperature, some of your chocolate coins went through a physical change from a solid to a liquid. This process is called melting. Energy was added to the chocolate by either sunlight or heat and this energy caused the molecules that make up the solid chocolate to move about and spread out and become a liquid.

Extra Experiments:

1. Use a thermometer to record the temperature of the different spots. Can you figure out what temperature chocolate starts to melt?
2. Try using other types of chocolate, for example, white or dark chocolate. Do the results change?
3. How long does chocolate take to melt in your mouth? What temperature is the human body? Does this help prove or disprove your hypothesis on what temperature chocolate melts at?

12.Dyed Flowers

Materials:

- 3 White Carnations
- 3 Bottles of Food Coloring in Assorted Colors
- 3 Clear 16 oz Plastic Cups
- Water
- Scissors

Instructions:

1. Fill each cup with water half way.
2. Add 3 drops of food coloring into each of the cups. Each cup should be a different color.
3. Carefully cut the end of each of the flower's stem.
4. Place each stem in a different colored water cup.
5. Wait one hour and observe your flowers' petals.
6. Wait one day and observe your flowers' petals.

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How it Works:

The Xylem of the flower works like an elevator and brings the water from the cup all the way up the plant's stem and into the plant's petals. When it brings the dyed water up it ends up dying the plant's petals. The Xylem is what allows the plant to get water from the roots all the way to the petals.

Extra Experiments:

1.
1. What happens if you try doing 5 drops of food coloring instead of 3 drops?
2. Keep a picture log of your flower. Take a picture each day, and see how many days does it take for your flower's petals to look the most saturated in color.
3. Try using other types of flowers. Do they work as well? Why do you think we suggested using white flowers?