BOOK

7

SEVENTH GENERATION SCIENCE EXPERIMENTS

SEVENTH GENERATION CLUB

The Seventh Generation Club thanks Mad Science for their contribution of the fifteen experiments found in the Seventh Generation Club Science Experiments Book 7.

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Ketchup Art for a Penny

What you need:

Tarnished (brown) penny
Toothpick
Paper towel
Ketchup packet (found at fast-food restaurants)
Clock or watch

What you do:

Carefully tear the ketchup packet at one corner.

Use the toothpick to dab ketchup and make a pattern on the penny.

Wait 1 full minute, and then wipe off the ketchup with the paper towel.

What do you see?

Try this experiment using different substances like soy sauce, vinegar, or toothpaste. How well do they work?

What's going on?

You just performed a chemical reaction! While new pennies are shiny, old pennies are covered in a brown coating called copper oxide. Copper oxide is formed when copper combines with oxygen, just like iron combines with oxygen to form rust. When you coated the penny with ketchup, the vinegar in the ketchup combined with the copper oxide and changed into chemical called copper acetate. Copper acetate can be wiped off the penny! The copper oxide coating that was in contact with the ketchup has been removed, so the spots look nice and coppery bright after the reaction. Any substance containing vinegar will also have this effect on a penny.

Note: Do not try this experiment with your coin collection because the chemical reaction removes some of the copper from the penny. This could ruin some of the fine details and lessen the value of a collector's coin.

PaperClip Float

What you need:

Paperclip
Fork
Bowl of water
Dish detergent

What you do:

Place the paperclip on the fork and gently lower it into the bowl of water.

Does the paperclip sink with the fork or does it float?

Without touching the paperclip, remove the fork from the bowl.

Add 1 drop of soap. What happens?

What's going on?

Water is a polar chemical. That means each water particle, called a molecule, has a positive and negative charge. The water molecules are attracted to each other and "stick" together. The positive end of one molecule sits next to the negative end of another molecule. The water particles at the surface "stick" only to particles next to and below them. This makes the surface act as if it had a thin "skin." This is called surface tension. The surface tension of water is strong enough to support a paperclip! The fork helps you lower the paper clip gently into the water without breaking the surface tension.

When you put the soap into the water, it disrupts the order of the water molecules. The water molecules are no longer lined up from positive to negative, so the surface tension is no longer strong enough to support the paperclip weight. The paperclip falls into the water.

Balloon Kabob

What you need:

Balloon
BBQ skewer or knitting needle
Petroleum jelly or baby oil

What you do:

Coat the skewer or knitting needle in petroleum jelly or baby oil.

Blow up the balloon until it is round like a ball and soft enough to squeeze gently.

Starting at the spot on the balloon where the color is darkest, this should be opposite to where the balloon is tied, slowly twist the skewer in one direction while gently forcing it into the balloon.

Keep twisting the skewer in the same direction until it pokes through the balloon.

Slide the skewer until the tip is touching the spot where the balloon is tied off.

Slowly twist the skewer while forcing it through the skin of the balloon until it pierces through the balloon.

Did the balloon pop?

What's going on?

You skewered a balloon! Balloons are made from a thin sheet of rubber called latex. A latex balloon is like a stretchy ball because it is made of polymers, which are like long, thin, tangled chains. These polymers are linked together by bonds called cross-links, which form a web that can be stretched and returned to its original shape. The balloon's latex will stretch a lot, but the dark spots at the areas around the knot and opposite end will not stretch much, if at all. The spots are dark because they're thicker then the rest of the inflated balloon.The balloon does not break when a very sharp skewer is slowly forced through the dark spots, because the polymers are pushed aside and remain bonded by the cross-links. (The skewer will slide in easily and seal the hole if it is coated with oil or petroleum jelly.) If you give the balloon a sharp poke with the skewer, the strands will break and the balloon will pop.

Softening the Suds

What you need:

Distilled water 2 cups (500ml)
Tap water 1 cup (250ml)
Epsom salt
3 empty soft-drink bottles with screw caps (500ml)
Dish detergent

What you do:

Fill two of the bottles with 1 cup of distilled water each.

Add 1 teaspoon of Epsom salt to one of the bottles. Cap and shake the bottle until the salts have dissolved.

Add 5 drops of dish detergent to each bottle. Cap and shake the bottles.

Which bottle formed suds?

Fill the third bottle with tap water, and repeat the experiment.

Did the third bottle form suds?

What's going on?

When cornstarch and water are mixed together, the mixture has a very unusual consistency. The mixture sometimes acts like a liquid and sometimes acts like a solid. Just what is this type of material called? Well, scientists have come up with a name for materials that sometimes act like a liquid and other times they act like a solid. They are called thixotropic fluids. When you move the cornstarch and water quickly the molecules don't have time to spread apart and the material acts like a solid. When you move the cornstarch and water slowly, the molecules have plenty of time to spread apart and act like a liquid. An everyday example of this is quicksand. Quicksand is a mixture of water and sand.

Sharing the Swing

What you need:

Long piece of string 3ft (90cm)
2 Dixie cups (small paper cups)
Masking tape
2 chairs
2 metal coat hangers
Clay, pebbles, or sand
Ruler (30cm)

What you do:

Pull the metal coat hanger into a diamond shape. Stretch this diamond shape so that the hook is at a longer end of the diamond. Repeat this step with the second metal coat hanger so that they are the same length.

Using the end of the hook, poke a hole in the side of the cup, just above the bottom of the cup. Slip the hook of a coat hanger through the hole and tape the coat hanger securely in place along the outside of the cup.

Fill each Dixie cup with equal amounts of clay, pebbles, or sand. Tape the top of each cup so that the contents cannot fall out. These two objects are called pendulums.

Using the ruler, start at one end of the string and measure a length of 30cm. Tie this string length to the corner of one coat hanger, opposite the Dixie cup. Tie the second coat hanger to the string so that there is a 30cm distance between both coat hangers.

Stand the two chairs back-to-back, about 60 cm apart. Tie the string ends to the two chairs. The two coat hangers should be hanging from the string and able to swing back and forth easily.

Gently pull back one pendulum about half an arm's length and let go.

Watch the second pendulum. How does it move?

What's Going On?

You created a coupled resonance pendulum! A pendulum is a weight that can swing back and forth from the support that it is attached to. As the pendulum swings back and forth, it pulls on the connecting string and gives the second pendulum a small tug. This is like pushing a playground swing. When you push the swing at just the right moment, it goes higher and higher. When you push the swing at just the wrong moment, it slows down and stops. While the first pendulum pulls on the second pendulum at the right moment, the second pendulum pulls on the first pendulum at just the "wrong" moment. As soon as the second pendulum starts to swing, it pulls back on the first pendulum so that the first pendulum slows down and eventually stops. Once the first pendulum has stopped, the second pendulum starts to tug on it at the "right" moment, and the first pendulum starts to swing again. This back and forth swinging is called coupling, because the swing of one pendulum affects the swing of the other. This experiment will not work if the pendulums are not the same length and weight.

Wind-Finder

What you need:

Feather
Transparent tape
Marker
Cardboard paper (1cm x 2cm)
Compass
Straw
Straight stick to fit easily inside the straw (like a barbeque skewer)

What you do:

Cut the straw in half. One half will be the wind-finder and the other one will be its support.

Fit the feather into one end of the wind-finder straw and tape the feather in place.

Use the marker to draw an arrow pointing away from the feather at the other end of the straw.

Balance the straw between your fingers until you find its centre of gravity. (It should balance on your finger rather than tilt to one side.) Mark this spot with the marker.

The second straw is your support straw. Cut into the end of this straw with your scissors to make 4 equal flaps, about 0.5cm deep.

Peel back two of the flaps (pick two that are opposite each other) and lay the wind-finder straw across the flaps. Position the marked center of gravity of the wind finder straw at the flaps. The two straws should form a "T" shape.

Tape the two straws together.

Attach the stick upright somewhere high up and in the open, such as the top of a fence or gate post. Check that it is standing perfectly straight.

Fit the support straw onto the stick. The straws should still look like a "T" and should turn easily on the stick.

Use the marker to write the letter "N" on the cardboard paper.

Use your compass to find north, and then tape the cardboard paper to the north side of the stick, under the wind-finder.

When the wind blows, which direction does the stick turn?

What's Going On?

You just made a weather vane! A weather vane is a tool used to tell which direction the wind is coming from. Weather vanes are usually found on top of buildings so they can catch an open breeze. The breeze turns the arrow on the weather vane until both sides catch equal amounts of wind. The part of the vane that turns toward the wind is usually shaped like an arrow. The other end is wide so it catches the smallest breeze. Directional indicators, such as the "N" that you taped to the stick, are used to locate the wind direction.

Painting Naturally

What you need:

Vegetable skins (carrots, radishes, beets, zucchini)
Whole vegetables (spinach, broccoli, peppers)
Any other available fruits or flowers
1 cup (for each plant)
Scissors or knife
Teaspoons
Coffee filters
Sturdy sticks (for grinding)
Water
Paint brushes

What you do:

Place each plant in a cup. If possible, place them in the freezer overnight.

Once thawed, use the sticks to chop and grind the plants until they are pulpy.

Add 5 teaspoons of water to each cup and let the mixture sit for 5 minutes.

Dip a paintbrush into a cup and use a coffee filter to dab. Use different paintbrushes for each dye and create images on the coffee filters. What colors did you create?

What's going on?

You made natural dyes! The colored dyes that you made are from pigments found in plant cells. The pigment found in plants is what gives color just like the pigment found in our bodies gives hair, eye, and skin color. Freezing, chopping and grinding the plant helps break the plant cells so that the pigments can come out. Nearly every plant will produce some sort of color, whether we use leaves, bark, wood, roots, or fruit. The colorfastness, meaning the color that will not likely fade or run, varies with the actual color of the plant. Many plant pigments can be extracted and used as dyes, and these dyes can be made into inks with additives.

Static Attractions

What you need:

Thread
Plastic drinking straw
Plastic pen
Candle (long table-candle)

What you do:

Tie a piece of thread around the middle of a straw.

Ask a friend to hold the free end of the thread so that the straw suspends in the air.

Rub a pen on a rug until it feels warm (you are building up a charge).

Wait until the straw is still, and then bring the "charged" pen close to the ends of the straw.

What happens?

Repeat the experiment using the candle instead of the pen. Does the candle have the same effect as the straw?

What's going on?

You made an electroscope! Electroscopes can detect charges like static electricity. Static electricity stays in an object (which is why it is called static) until it is discharged onto another object. Rubbing your feet on a carpet builds up static electricity and touching a doorknob discharges it. Rubbing your pen on a rug charges up the pen's plastic with static electricity. Charges can be positive or negative, and the charge on glass and plastic tends to be negative. The ends of the electroscope will spin toward or away from a charged object since opposites attract and likes repel, depending on whether it is a negative or positive charge.

The first electroscope was a device called a versorium (from the Latin word meaning "turn about"). The versorium was invented about 300 years ago by a man named William Gilbert. His versorium consisted of a metal needle that could spin about freely on a support. The needle was attracted to and spun toward charged bodies that were brought close to it.

Soap Spheres

What you need:

Dish detergent
Tap water
Teaspoons
Measuring cups
1 empty soft-drink bottle with screw cap (500ml)
Straw
Glycerol, glycerin, or sugar

What you do:

Mix three parts dish detergent with seven parts water and one part glycerol.

Let the bottle sit in a fridge; overnight if possible.

Dip one end of the straw into the solution and then hold it so that most of the solution drips off.

Gently blow through the straw. What happens?

Repeat the experiment, but change the quantities of dish detergent, water, and glycerol. Which recipe creates the best bubbles?

What's going on?

You made a bubble solution! Bubbles are made of a thin elastic liquid film that is a mix of soap and water. This film is made up of three layers. The water layer is sandwiched between two layers of dish detergent. Water has a surface tension (see the Paperclip Float experiment) strong enough to support a paper clip. This surface tension is also what holds the bubble together. Dish detergent is made up of greasy and watery halves. The watery half mixes with the water, while the greasy half forms the layer covering both the inside and outside surface of the water bubble.

Bubble Balance

What you need:

Bubble solution (from the previous experiment)
Empty bucket
Measuring cups
Baking soda
Vinegar

What you do:

Place the bucket in an indoor area (with no draft).

Add 1/2 a cup of baking soda to the bucket.

Gently pour 1 cup of vinegar into the bucket. The contents will start to fizz.

Once the fizzing stops, blow bubbles gently over the bucket so they fall inside. (Blowing the bubbles directly into the bucket will cause the experiment to fail.)

Where do the bubbles land?

What's going on?

Your bubbles are floating on top of a chemical reaction! Vinegar is an acid, and baking soda is a base. Acids contain particles called hydrogen, and bases contain particles called hydroxide. Mixing acid and base together creates a reaction that connects the hydrogen with the hydroxide, which makes water! Baking soda is a base that contains carbonate. (The scientific name for baking soda is sodium bicarbonate.) During the acid and base reaction, the carbonate also reacts and forms carbon dioxide. This is the gas that caused the fizzing in the bucket.

The air that you exhaled contained both oxygen and carbon dioxide, so the bubbles you made were filled with a lighter gas mixture than the carbon dioxide produced from the acid and base reaction. Because carbon dioxide is heavier than air, the gas stayed at the bottom of the bucket. The bubbles you blew into the bucket stopped falling partway, because they were supported by a layer of carbon dioxide that was produced from the acid and base reaction!

Insulating Innovation

What you need:

Half-full cup of sand
Very warm water
Large plastic resealable bag
Small plastic resealable bag
Newspaper
Aluminum foil
Face or dish towels
Thermometer

What you do:

Add warm water to the cup until it just covers the sand.

Use the thermometer to take the temperature of the sand.

Without spilling the contents, place the cup inside the small resealable bag and seal it.

Choose one material that you think will keep the sand warm (newspaper, aluminum foil, or towels).

Wrap the small resealable bag with the chosen material and put the bundle into the larger resealable bag. Seal the large bag.

After 15 minutes, use the thermometer to take the temperature of the sand.

Repeat the experiment with the other two materials.

Which material kept the cup of sand the warmest?

What's going on?

You've created insulation! Heat is in constant motion. It flows from warmer areas to colder areas until it is equally distributed. Insulation provides a barrier to keep the heat from escaping. Two types of insulation are commonly used. The cloth towels and newspapers provide bulk insulation. Bulk insulation works by trapping pockets of still air. These air pockets provide a barrier against heat flow. The aluminum foil provides reflective insulation. Reflective insulation works by reflecting heat away from its highly reflective surface. This heat is reflected back at the object.

Oil Dance

What you need:

Clear glasses
Water
Vegetable or baby oil
Salt
Sugar
Sand
Teaspoon

What you do:

Fill the glass halfway with water.

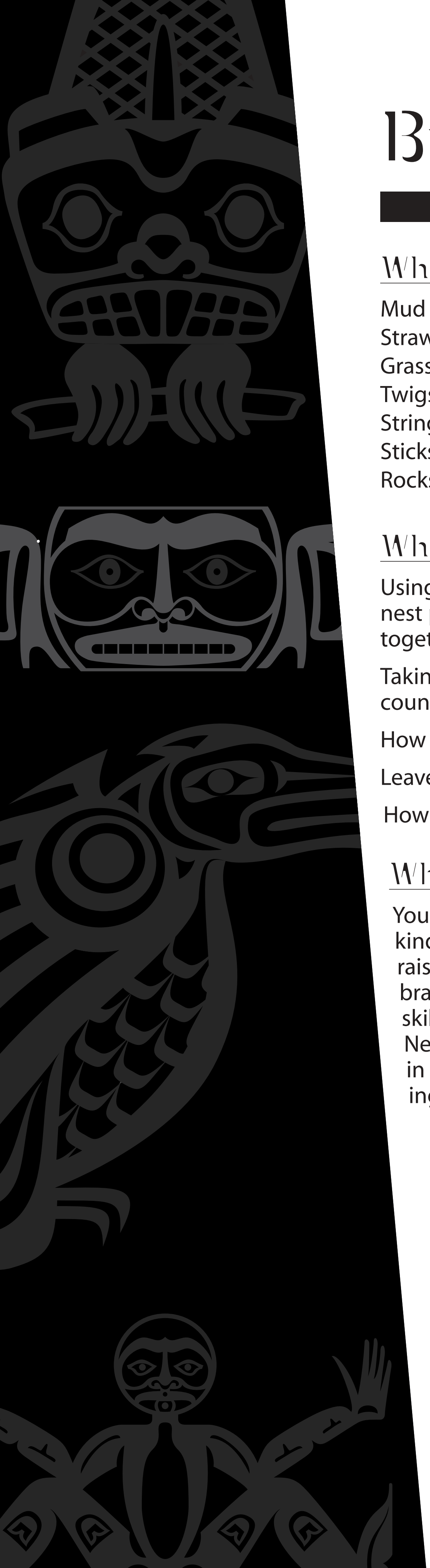
Add a layer of oil about 1/2 an inch thick.

Add 1 teaspoon of salt. What happens?

Repeat the experiment with the sugar and sand. Does the same thing happen?

What's going on?

You created a density dance! The bubbles sink and rise because of the changing densities in the oil. Density is the mass of an object in a given volume. A sponge has less mass than a brick that is the same size, and you can feel this difference because the sponge is lighter than the brick. Oil is a liquid that is less dense than water, so it floats on top of water. When you poured the salt into the glass, it mixed with the oil to form an oily salt bubble. The salt and oil are denser than the water alone, so the bubble sinks. When the salt from the bubble dissolved in the water, the remaining oil floated back to the top. The same thing will happen with the other materials, the sugar and sand, which also dissolve in water.



Building for the Birds

What you need:

Mud
Straw
Grass
Twigs
String
Sticks
Rocks (egg-size)

What you do:

Using mud, straw, grass, twigs, sticks, and string, build the strongest nest possible. Make your nest about the size of your two hands put together and fingers spread apart.

Taking care not to break it, place the nest in a low tree branch and count the number of egg-size rocks that can fit inside,

How strong is your nest?

Leave your nest in the tree and visit it every day for a week.

How does it hold against the wind, rain, and sun?

What's going on?

You just put yourself in the claws of a bird! Most birds build some kind of nest to protect their eggs. They may also use the nest to raise their hatchlings. Most often, we see nests between tree branches. Birds use a number of weaving, packing, and building skills to build their nests from the material available in their habitat. Nests come in many shapes and sizes, and they are not only found in tree holes but also in different places like tunnels. Imagine building your nest with just a bird beak!

Slingshot Airplanes: Kimoto Flyer

What you need:

Styrofoam plate 10" (25.4cm)
Sheet of paper
Kimoto Flyer pattern (on the next page)
2 Paper clips
Pen
Needle-nosed pliers
Scissors
Transparent tape
Rubber band

An adult may need to supervise the use of scissors!

What you do:

Trace the pattern on the next page onto the sheet of paper.

Cut along the outside solid lines of the pattern and tape it face-up onto the Styrofoam plate.

Pierce holes with your pen along the solid and dotted lines so it marks the Styrofoam plate.

Remove the pattern and cut along the solid lines of your Styrofoam plate. Be careful not to cut yourself, and carefully cut along the lines when cutting out the inside area.

Follow the dotted lines to bend the body down the middle and the solid lines to bend the airfoil (tail) upward.

Use the pliers to bend the paperclip arm upward to a 90° angle.

Clip the unbent arm of the paperclip onto the nose of the Kimoto Flyer with the bent part facing downward, and tape it in place.

Slip the rubber band onto the second paper clip to make your slingshot launcher.

Loop the rubber band launcher around the bent paperclip. Hold the paper clip launcher in one hand and pull back on the bent paper clip (the part facing down) with your other hand. Let go of the bent paper clip to sling your Kimoto Flyer.

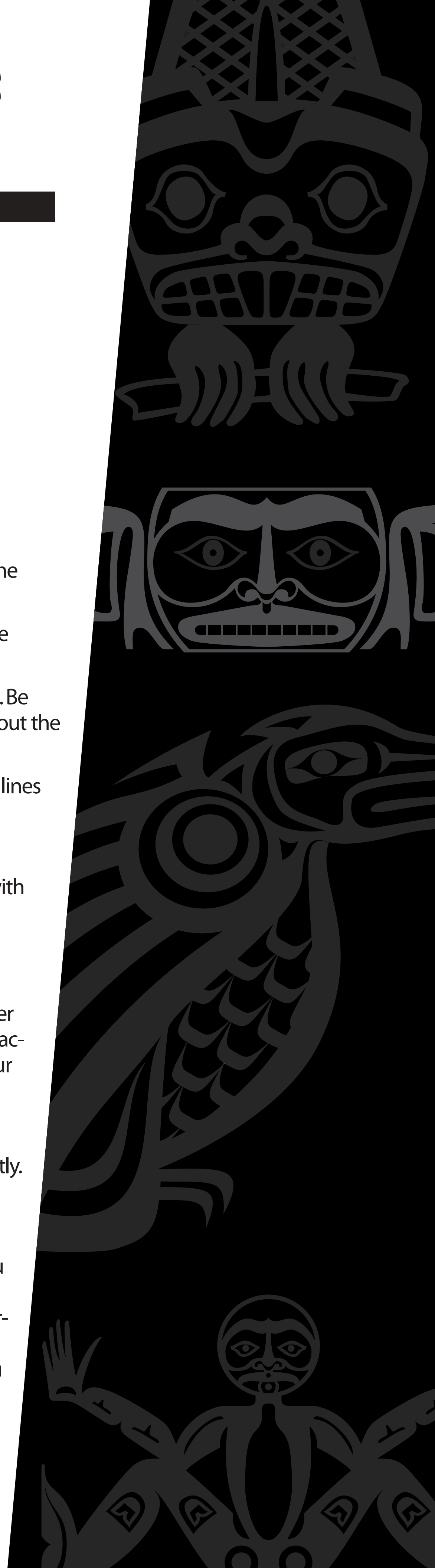
How does your Kimoto Flyer fly?

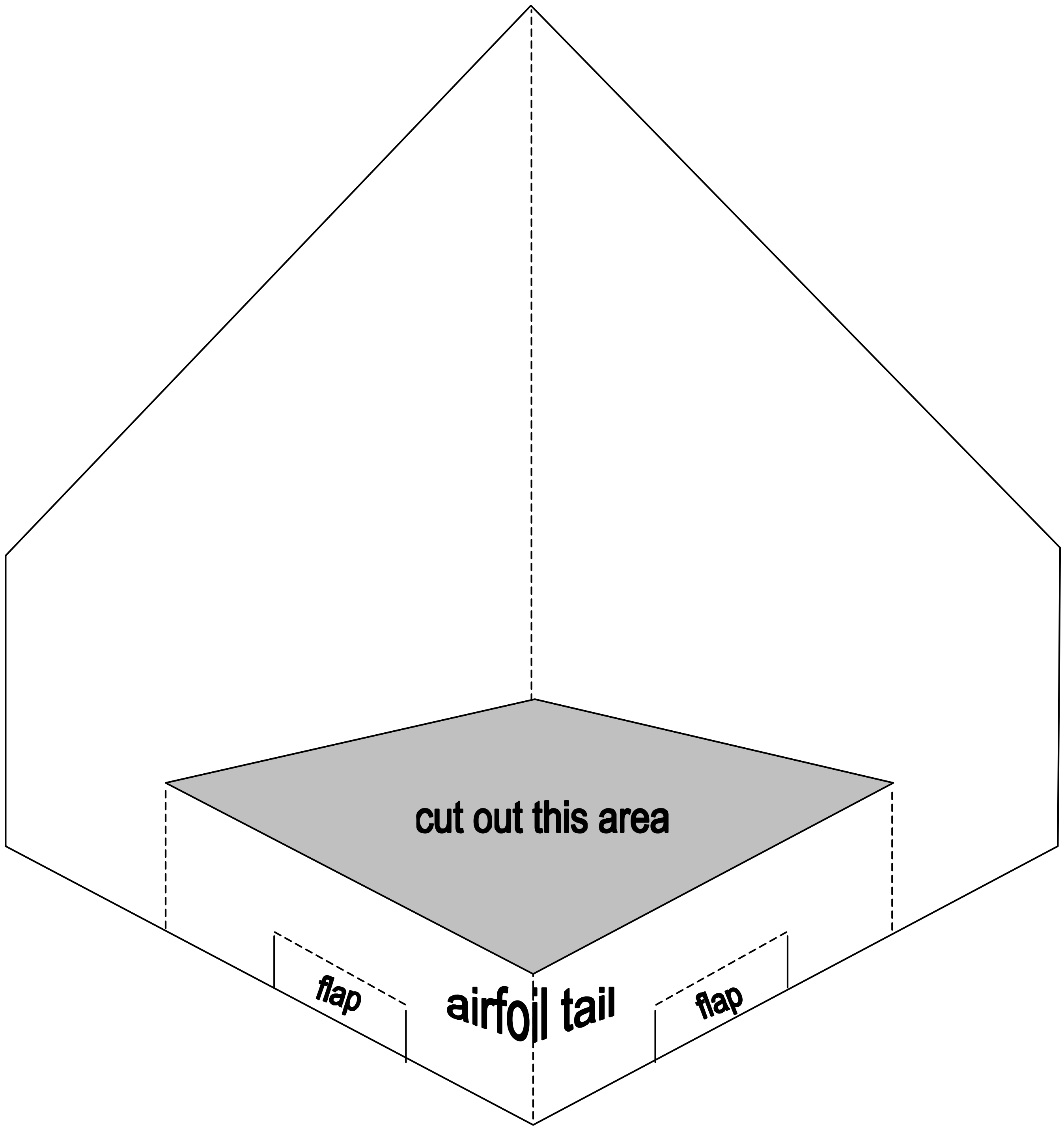
Adjust the flaps on the airfoil tail to make your Kimoto Flyer move differently.

What's going on?

The rubber band acts like a sling shot for your Kimoto Flyer. The more you pull back the flyer, the more the elastic band builds energy. This energy transforms into an energy called kinetic, which forces the Kimoto Flyer forward when it is released. The shape of the wings, airfoil tail, and the angle of the flaps affect how your Kimoto flyer moves in the air. How would you make the model airplane soar, curve, dive, etc.?

[To make the model soar, fold both flaps upward. To make it dive, fold the flaps downward. If you want to make it curve to the left, fold the left aileron wing downward and the right one upward. If you want to curve it to the right, fold the right aileron wing downward and the left one upward.]




cut out this area
flap
airfoil tail
flap

What's a degree Celsius?

The **degree Celsius (°C)** is a metric unit of temperature. The unit is named after Swedish astronomer and physicist Anders Celsius (1701-1744), who made up a similar scale.

What's a meter?

The **meter (m)** is the metric unit of distance. The meter was originally measured as one ten-millionth of a quadrant (the distance between the Equator and the North Pole). As of 1983, the 17th General Conference on Weights and Measures defined the meter as that distance covered by the speed of light 1/299,792,458 of a second. The name comes from the Latin metrum and the Greek metron, both meaning "measure."

What's a newton?

The **newton (N)** is a unit used to measure force. The unit is named after Isaac Newton (1642-1727), who was the first to understand clearly the relationship between force (F), mass (m), and acceleration (a) expressed by the formula $F = ma$.

What's a watt?

The **watt (W)** is a unit used to measure power, or the rate at which energy is used. The name of the unit honors British engineer James Watt (1736-1819), who built the first practical steam engine.

What's an ohm?

The **ohm [Ω]** is a unit used to measure electric resistance, reactance, and impedance. The unit honors German physicist Georg Simon Ohm (1787-1854).

What's a sievert?

The **sievert (Sv)** is a unit used to measure the effect of a radiation dose on a living organism. The sievert is a large unit, so radiation doses are often measured in millisieverts (mSv). The unit honors Swedish physicist Rolf Sievert (1898-1966), who worked over many years to measure and standardize the radiation dose used in cancer treatment.

What's a pascal?

The **pascal (Pa)** is a unit used to measure pressure. Pressure is more commonly measured in kilopascals (kPa) and air pressure can be measured in hectopascals (hPa). The unit is named after French philosopher and mathematician Blaise Pascal (1623-1662), who was the first person to use a barometer to measure differences in altitude.

Fun Facts on Units

What's an amp?

The **ampere (A or amp)** is a unit used to measure electric current. The unit is named after French physicist André-Marie Ampère (1775-1836), a pioneer who studied electricity.

What's a decibel?

The d**ecibel (dB)** is based on the unit bel (B) to measure the intensity of sound. On the sound scale, 10 decibels equal 1 bel. The decibel is named after Alexander Graham Bell (1847-1922), the inventor of the telephone.

What's a darwin?

The **darwin** is used by scientists to measure the rate of evolution in characteristics of organisms. The unit is named after English biologist Charles Darwin (1809-1882), who founded the theory of evolution.

What's a degree Fahrenheit?

The **degree Fahrenheit (°F)** is a traditional unit of temperature commonly used in the United States. The unit is named after German physicist Daniel G. Fahrenheit (1686-1736), who also invented the mercury thermometer.

What's a hertz?

The **hertz (Hz)** is the unit used to measure frequency. The frequencies of radio and television waves are measured in kilohertz (kHz), megahertz (MHz), and even gigahertz (GHz). Cellular phones and microwave ovens operate with radio waves that have frequencies in the gigahertz range. The unit is named after German physicist Heinrich Rudolf Hertz (1857-1894), who worked on discovering how frequencies travel.

What's a mach?

The **Mach** or **mach** (M or Ma) is used to describe the speed of an aircraft relative to the speed of sound. "Mach 1.0" is the speed of sound; "Mach 2.0" is twice the speed of sound, and so on. The unit is named after Austrian physicist Ernst Mach (1838-1916), who helped establish this value.

What's a volt?

The **volt (V)** is a unit used to measure electric potential, or the potential energy in an electric charge. The name of the unit honors the Italian scientist Count Alessandro Volta (1745-1827), who invented the first battery.

Fun Facts on non-Metric Units

What's a baker's dozen?

The **baker's dozen** is an informal unit of quantity, equal to 13. Bakers often toss in an extra item for each dozen bought, making a total of 13.

What's a googol?

The **googol** is a unit of quantity equal to 10100 (1 followed by 100 zeroes). The googol was invented by American mathematician Edward Kasner (1878-1955) in 1938. Kasner asked his nephew Milton Sirotta, who was then 8 years old, what name he would give to a really large number. Milton answered "googol."

What's an inch?

The **inch (in or ")** is a traditional unit of distance equal to 1/12 foot or exactly 2.54 centimeters. The old english word ynce is derived from the Latin uncia, meaning a 1/12 part. The inch was originally defined as the man's thumb width at the base of the nail. In fact, in many European languages the word for inch also means thumb.

What's a league?

The **league** is a traditional unit of distance. The name leuga comes from the Romans and was intended to represent, roughly, the distance a person could walk in an hour (3 miles or 4.8 km).

What's a leap second?

The **leap second** is an extra second added at the end of a day either on June 30th or December 31st, which realigns timekeeping with the earth's rotation rate.

What's a leap year?

The **leap year** is a unit of time equal to 366 days instead of 365 days. A leap year is a year in which, an extra day, February 29th is added to the calendar in order to relate it to the seasons.

What's a mickey?

The **mickey** is a unit used in computer science to program a computer mouse. One mickey's the length of the smallest detectable movement of the mouse. This depends on the equipment. Typical values are in the range 1/200 to 1/300 inch or roughly 0.1 mm. The name mickey comes from the Disney cartoon character

Fun Facts on non-Metric Units

What's a pat?

A **pat** is an individual serving of butter. In American recipes, a pat of butter is typically 2 teaspoons (1/3 fluid oz or about 10 mm). In the food industry, restaurant butter servings were traditionally packaged at 100 pats per kilogram, 10 grams per pat.

What's a pinch?

A **pinch** is an informal unit of volume used in food recipes. Historically a pinch was defined as "an amount that can be taken between the thumb and forefinger." But a pinch is not equal to any numerical value.

What's a foot?

The **foot (ft or ')** is a traditional unit of distance. Almost every culture has used the human foot as a unit of measurement. In fact, 1 foot = 3 hands = 4 palms = 12 inches (thumb widths) = 16 digits (finger widths).

What's a pound?

The **pound (lb)** is a traditional unit of mass or weight. The symbol comes from the Latin word libra for the Roman version of the same unit, and the word comes from the Latin word pondo "weight."

What's a month?

The **month (mo or mon)** is used in calendars and approximately as long as some natural period related to the motion of the Moon. The word month comes from the word moon (Moonth). This unit of time is equal to approximately 1/12 year, but varies from 28 to 31 days.

What's a mile?

The **mile (mi) [1]** is a traditional unit of distance. Originally a mile was the distance a Roman legion could march in 1000 paces or 2000 steps. A pace is the distance of a walking step. The word mile comes from the Latin word mille, which means one thousand.

Seventh Generation Club
Mission Statement

To create a club where First Nations youth can envision their future by recognizing their own energy, the culture of their people, and the teamwork needed to succeed by giving them opportunities to make healthy life choices, participate in their community, and to meet the challenges of life.

The Seventh Generation Club would like to thank the following partners:

Indian and Northern Affairs Canada   Affaires indiennes et du Nord Canada

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Administration and coordination is provided by the
First Nations Schools Association

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SEVENTH GENERATION CLUB