

Québec Tech & Nature

The Quebec program pair is proud to present the second of the Quebec-specific badges. It is set up such that girls from any branch can complete it.

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Introduction

The province of Quebec is known for its science and innovation. Companies such as Bombardier and Ubisoft have put us on the map. The Canadian Space Agency's headquarters in St-Hubert provided equipment for astronauts to land on the moon and for robots to land on Mars. Our provincial parks provide grounds for all types of nature exploration.

The challenge is set up to encourage you to visit one or more of the scientific institutions throughout Quebec. However, we are aware that this isn't always possible or ideal, so each museum or science centre has one or more related activities that you can use instead or to complement a visit. The table below shows what a girl in each branch needs to do to earn the Québec Tech & Nature badge.

Branch	Options to Earn Crest (choose one bullet point)
Sparks	<ul style="list-style-type: none">• One visit• 2 activities
Brownies	<ul style="list-style-type: none">• One visit• 3 activities
Guides	<ul style="list-style-type: none">• 2 visits• 1 visit + 2 activities• 4 activities
Pathfinders	<ul style="list-style-type: none">• 2 visits• 1 visit + 3 activities• 5 activities
Rangers	<ul style="list-style-type: none">• Complete either the Pathfinder or Guider requirements
Guiders	<ul style="list-style-type: none">• Complete the requirements for the branch that you are doing the challenge with.

Museums and Science Centres

The following are all suggested activities and institutions. You may complete any other science-related activity that you feel fits the aims of this challenge.

Animal Science	
<p>Biodôme Montreal</p> <p>The Biodôme is part of the Space for Life. During your visit, you can explore the flora and fauna found in the five ecosystems of the Americas.</p> <p>Try <i>Food Web (p. 10)</i> or <i>Animal Headbands (p. 29)</i></p>	<p>Insectarium Montreal</p> <p>The Insectarium is part of the Space for Life. As its name suggests, its exhibitions are devoted to insects around the world.</p> <p>In the winter, they host an event called Butterflies Go Free, where you can enter an entire greenhouse filled with butterflies.</p> <p>Try <i>Butterfly Mobile (p. 9)</i> or <i>Honeybee Dance (p. 30)</i></p>
<p>Zoo sauvage de Saint-Félicien Saint-Félicien</p> <p>The zoo holds over 1000 live boreal animals in natural wide-open spaces. You can board a caged train and walk along pedestrian pathways to visit them.</p> <p>Try <i>Food Web (p. 10)</i></p>	<p>Ecomuseum Montreal</p> <p>The Ecomuseum is an outdoor zoo that houses over 115 animal species from Quebec in a cozy and natural setting. They offer daytime programs and sleepovers.</p> <p>Try <i>Food Web (p. 10)</i></p>
<p>Centre d'interprétation des battures et de réhabilitation des oiseaux (CIBRO) Saguenay-Lac-Saint-Jean</p> <p>At CIBRO, you can learn all about more than 200 species of birds and local biodiversity.</p> <p>Try <i>Bird Feeders (p. 34)</i></p>	<p>Pavillon de la Faune Estrie</p> <p>While on your visit, you can discover naturalized animals from all across North America as well as penned animals such as cougars, lynx, elks, bears, raccoons, donkeys, goats and ponies.</p> <p>Try <i>Animal Headbands (p. 29)</i></p>

<p>Musée du Fjord <i>Saguenay-Lac-Saint-Jean</i></p> <p>Explore the history and aquatic biology of the Saguenay Fjord.</p> <p>Try <i>Fish Life Cycle (p. 19)</i></p>	<p>Centre d'interprétation des mammifères marins <i>Tadoussac</i></p> <p>Explore the world of whales with skeletons, games and videos.</p> <p>Try <i>Floating Ball (p. 31)</i></p>
<p>Pointe-Noire Interpretation and Observation Centre <i>Charlevoix</i></p> <p>Enjoy sea vistas and the sound of blowing whales while observing the belugas and soaking up the venue's rich history. Chat with interpreter-guides and explore the exhibition in the lighthouse keeper's house.</p> <p>Try <i>Floating Ball (p. 31)</i></p>	<p>Cap de Bon-Désir Interpretation and Observation Centre <i>Tadoussac</i></p> <p>Learn about navigation and maritime life through interpretive activities at the lighthouse.</p> <p>Try <i>Fish Life Cycle (p. 19)</i></p>
<p>Space Science and Astronomy</p>	
<p>Cosmodôme <i>Laval</i></p> <p>The Cosmodôme is devoted to space and space exploration. While there, you can go on virtual missions, explore the planets, learn about how the first humans made it into space or even train as an astronaut.</p> <p>Try <i>Space Station (p. 14)</i> or <i>Mystery Tube (p. 37)</i></p>	<p>Rio Tinto Alcan Planetarium <i>Montreal</i></p> <p>The Planetarium is part of the Space for Life. While there, you can watch two planetarium shows and explore exhibitions about astronomy.</p> <p>Try <i>Telescopes (p. 16)</i> or <i>Mystery Tube (p. 37)</i></p>
<p>Astrolab: Lac Mégantique Observatory <i>Notre-Dame-des-Bois</i></p> <p>Discover the wonders of the stars through daytime and nighttime astronomy activities.</p> <p>Try <i>Telescopes (p. 16)</i> or <i>Mystery Tube (p. 37)</i></p>	<p>ASTER <i>St-Louis-du-Ha-Ha</i></p> <p>ASTER houses a museum about astronomy and a celestial telescope.</p> <p>Try <i>Telescopes (p. 16)</i> or <i>Mystery Tube (p. 37)</i></p>

Energy	
<p>Centre d'interprétation des énergies renouvelables (CIER) (renewable energy) <i>Richelieu</i></p> <p>During your visit, you can discover the value of wind, geothermic and solar energy.</p> <p>Try <i>Wind Boats (p. 41)</i> or <i>Water Wheel (p. 39)</i></p>	<p>La Cité de l'énergie <i>Shawinigan</i></p> <p>ENERGIA, the science portion of La Cité de l'énergie, is a dynamic exhibition that takes a fresh look at the energy issues that have dominated global headlines over the years.</p> <p>Try <i>Waterwheel (p. 39)</i></p>
<p>Électrium <i>Sainte-Julie</i></p> <p>Électrium is Hydro-Quebec's interpretation centre, where you can learn about the wonders of electricity.</p> <p>Try <i>Water wheel (p. 39)</i></p>	
Nature	
<p>Arundel Nature & Science Centre <i>Arundel</i></p> <p>Set in 155 hectares of natural beauty in the heart of the Laurentian Mountains, the Arundel Nature and Science Centre represents a unique opportunity to engage in meaningful learning outdoors through activities such as star gazing and pond water microscopy.</p> <p>Try <i>Water Cycle (p. 12)</i> or <i>Meeting Place Watershed (p. 21)</i></p>	<p>Sherbrooke Nature Science Museum <i>Sherbrooke</i></p> <p>A natural history and science museum with various permanent and temporary exhibitions.</p> <p>Try <i>Meeting Place Watershed (p. 21)</i> or <i>Walking Water (p. 33)</i></p>
<p>Botanical Garden <i>Montreal</i></p> <p>The Botanical Garden is part of the Space for Life. While there, you can wander through 20 thematic gardens. In the fall, they host the Chinese Lantern festival.</p> <p>Try <i>Grass-head (p. 24)</i> or <i>Walking water (p. 33)</i></p>	<p>Biophare <i>Sorel-Tracy</i></p> <p>Discover the Lac-Saint-Pierre Reserve's flora and fauna through museum exhibitions and hiking trails.</p> <p>Try <i>Food Web (p. 10)</i></p>

<p>Centre de la biodiversité du Québec An interpretation centre offering unique contact with nature and its living species.</p> <p>Try <i>Food Web (p. 10)</i> or <i>Bird Feeders (p. 34)</i></p>	
Mining	
<p>Mine Cristal Bonsecours</p> <p>Discover the world of quartz and quartz crystals through a mine tour and small museum.</p> <p>Try <i>Salt and Sugar Crystals (p. 42)</i></p>	<p>Musée minéralogique et minier de Thetford Mines Thetford Mines</p> <p>Explore the world of asbestos mining through the Thetford Mines exhibitions</p> <p>Try <i>Starburst Geology (p. 28)</i></p>
<p>Musée minéralogique de l'Abitibi-Témiscamingue</p> <p>Explore exhibits and interactive activities to learn about the world of minerals.</p> <p>Try <i>Salt and Sugar Crystals (p. 42)</i></p>	
Other	
<p>Musée Armand-Frappier Laval</p> <p>During your visit, you will explore the world of biosciences and learn about everything from GMOs to superbacteria.</p> <p>Try <i>Discover Enzymes (p. 11)</i> or <i>Lungs (p. 36)</i></p>	<p>Montreal Science Centre Montreal</p> <p>The museum is home to interactive exhibitions on science and technology as well as an IMAX theatre</p> <p>Try <i>Friction Superglue (p. 26)</i>, <i>Is the Glass Really Full? (p. 25)</i>, <i>Lungs (p. 36)</i> or <i>Walking Water (p. 33)</i></p>
<p>C.I.Eau Laval</p> <p>Visit the interactive exhibition, <i>Water Path, from the River and Back</i>, following the fantastic journey of a water drop from the river up to when it becomes drinkable.</p> <p>Try <i>Water Cycle (p. 12)</i>, <i>Meeting Place Watershed (p. 21)</i>, <i>Is the Glass Really Full? (p. 25)</i> or <i>Walking Water (p. 33)</i></p>	

Activities by Branch

Sparks

- Butterfly Mobile
- Discover Enzymes
- Water Cycle
- Space Station
- Telescopes
- Fish Life Cycle
- Meeting Place Watershed
- Grass Head
- Is the Glass Really Full?
- Friction Superglue
- Starburst Geology
- Animal Headbands
- Honeybee Dance
- Walking Water
- Bird Feeders
- Wind Boats
- Salt and Sugar Crystals

Brownies

- Butterfly Mobile
- Food Web
- Discover Enzymes
- Water Cycle
- Space Station
- Telescopes
- Balloon Rocket
- Fish Life Cycle
- Meeting Place Watershed
- Grass Head
- Is the Glass Really Full?
- Friction Superglue
- Starburst Geology
- Animal Headbands
- Honeybee dance
- Floating Ball
- Walking Water

- Bird Feeders
- Water Wheel
- Wind Boats
- Salt and Sugar Crystals

Guides

- Food Web
- Water Cycle
- Space Station
- Telescopes
- Balloon Rocket
- Meeting Place Watershed
- Is the Glass Really Full?
- Friction Superglue
- Starburst Geology
- Animal Headbands
- Floating Ball
- Walking Water
- Bird Feeders
- Lungs
- Mystery Tube
- Water Wheel
- Wind Boats
- Salt and Sugar Crystals

Pathfinders

- Food Web
- Space Station
- Balloon Rockets
- Meeting Place Watershed
- Friction Superglue
- Starburst Geology
- Bird Feeders
- Lungs
- Mystery Tube
- Wind Boats
- Salt and Sugar Crystals

Activity 1: Butterfly Mobile

Topic: Butterfly Life Cycle

Suggested branches: Sparks and Brownies

Time required: About 45 minutes

Girls will discover the life cycle of a butterfly by creating a mobile depicting the journey from caterpillar to butterfly.

1. Give the girls each a sheet of green construction paper to draw a leaf on and cut out. They should also draw small circles on the back side of their leaves.
2. Give the girls each a sheet of yellow construction paper to draw a caterpillar on and cut out.
3. Give the girls each a sheet of brown construction paper to draw a chrysalis on and cut out.
4. Give the girls each a sheet of construction paper of the colour of their choice to draw a butterfly on and cut out. Girls can fold the paper in half to make it symmetrical.
5. Have the girls tape or lash the popsicle sticks together in an “x”
6. Punch a hole in each of the pieces.
7. Give each girl 5 pieces of string. One to use to tie each piece to an end of the popsicle sticks and one to hang the whole thing with.

Supplies:

- Popsicle sticks
- Construction paper
- Markers
- Scissors
- String
- Hole punch
- Tape (optional)

*Quick tip: For younger girls, you can draw and/or cut out the shapes ahead of time

The science:

Butterfly eggs are usually laid on the underside of a leaf. They are what the circles represent. Once the eggs hatch, they turn into caterpillars. They don't live in this stage for very long and all they do is eat leaves. When it is ready, the caterpillar encases itself in a chrysalis and undergoes metamorphosis (transformation into a butterfly). Once that process is complete, a butterfly emerges and flies away to look for a mate in order to reproduce and start the cycle all over again.

Program Connections:

Sparks:

Going Outside #4

Brownies:

Wondrous Walks

Key to the Living World – Special Interest Badge

Activity 2: Food Web

Topic: Ecosystems and Food Chains

Suggested branches: Brownies, Guides and Pathfinders

Time required: About 30 minutes

Girls will understand how animals and nature are related through food webs

1. Start with a conversation about a hamburger patty. Where does the meat come from? From a cow. What does a cow need to survive? Water and food. What kind of food? Grass. What does the grass need? Sun and water. What would happen if one of those elements were missing? Could you still have a hamburger? You have just created a food chain.
2. Have the girls cut out pictures of animals or draw their own and glue them on a large piece of paper. Include the sun and plants as well. Then, have them draw a line from each picture to what it eats or needs to survive.
3. You have created a food web (a combination of multiple food chains). Take a look at how they cross and depend on each other. What would happen if you removed one of the pictures?

Supplies:

- Glue
- Magazines with pictures of animals and plants
- Markers

Program Connections:

Brownies:

Wondrous Walks

Key to the Living World – Special Interest Badge

Guides:

Beyond You – Learn about our Environment #4

Pathfinders:

Up Close and Personal with Nature

Activity 3: Discover Enzymes

Topic: Cell Biology

Suggested branches: Sparks and Brownies

Time required: About 10 minutes

Girls will discover how enzymes break down the food they eat

1. Give each girl half a slice of white bread
2. Instruct the girls to chew the slice of bread slowly and notice how the flavour changes as they chew.

Supplies:

- Half a slice of white bread for each girl

The science: Enzymes are used to speed reactions along in our bodies. There is an enzyme in our saliva called amylase that breaks down starch in our mouth when we chew. As the bread is chewed, the starch is broken down into smaller sugar molecules called glucose, which are what make the bread taste sweet.

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Key to STEM – Special Interest Badge

Activity 4: Water Cycle

Topic: Water Cycle

Suggested branches: Sparks, Brownies and Guides

Time required: About 20 minutes

Girls will understand how the water on our planet cycles through its different forms

1. Start by asking the girls if they know the different steps in the water cycle (evaporation, condensation, precipitation, run-off and infiltration).
2. Teach them the song below to the tune of “She’ll be coming ‘round the mountain” and have them come up with actions to go along with it. The song comes from: http://www.proteacher.org/a/12048_Water_Cycle_Song.html
3. The song only includes the first three steps, so ask them to come up with verses for the last 2.
4. Optional: Share a video of your unit singing your song on the Quebec Facebook Page or email it to programme@guidesquebec.ca

Water travels in a cycle, yes it does

Water travels in a cycle, yes it does

It goes up as evaporation

Forms clouds as condensation

Then comes down as precipitation, yes it does!

Supplies:

- Video camera (optional)

For older girls, talk brainstorm about ways that the water cycle changes or is affected when the water is polluted. Why do we worry about not having enough water even though the water travels in a cycle and never disappears?

The Science:

The water on the planet is the same as it has been at every point in history. No new water is created. It takes different forms and can be made more or less clean, but if you get a glass of water from your tap, you are essentially drinking the same water dinosaurs drank. It follows what we call the water cycle.

Evaporation: Water that is found in lakes, oceans and other areas on earth evaporates and goes from being a liquid to a gas thanks to the heat from the sun. You can compare this to what happens when you boil water.

Condensation: Once water is a gas, it rises and as it gets colder in the sky, it transforms back into a liquid. Thanks to the wind, the little droplets are brought together to form clouds.

Precipitation: When the clouds are heavy enough, the water falls back to the ground in the form of rain, snow, hail, sleet, etc.

Infiltration and run-off: At this point, two different things can happen to bring the water back to the bodies of water where it started. Either the water can infiltrate into the soil or it can stay above ground in what we call run-off (imagine it running down the side of a mountain)

You may have noticed that throughout the cycle water can take 3 forms: liquid, solid and gas.

Program Connections:

Sparks:

In my Community #3

Brownies:

Water All Around

Guides:

Beyond You – Learn about our Environment #3, 6

Activity 5: Space Station

Topic: Astronautics

Suggested branches: Sparks, Brownies, Guides and Pathfinders

Time required: About 35 minutes

Girls will understand that astronauts living in space currently live on the International Space Station and will create a Space station that will demonstrate what astronauts do while living there.

Supplies:

- Kleenex or shoe boxes
- Decorating supplies
- Paper towel rolls

Do the girls know what there are people living in space right now? You can visit <http://howmanypeopleareinspacerrightnow.com> for the answer. There have been many space stations over the years, but the most popular one right now is the International Space Station (ISS). Astronauts from many countries around the world (mainly Americans and Russians) live, eat, sleep, bathe and do science from a set of interconnected modules that altogether are about the size of a football field. The pieces were put together using American space shuttles, and Canada's greatest contribution is the Canadarm 2.

Show the girls the pictures on the next page and split them into small teams. Each team (representing a country) should get a shoe box or a Kleenex box that they can decorate however they like. They can use paint, glue, pipe cleaners, construction paper, etc. Once all the modules are done, you can connect them with paper towel rolls and show off your very own space station. What do you mean by "show them some pictures?"

* Alternatively, if you're feeling really ambitious, you could make a kid-sized space station out of refrigerator, moving or other large cardboard boxes.

Some of the modules on the actual station are used for eating, sleeping or exercising, as laboratories or bathrooms, to prepare for spacewalks or to hold supplies.

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Exploring Space

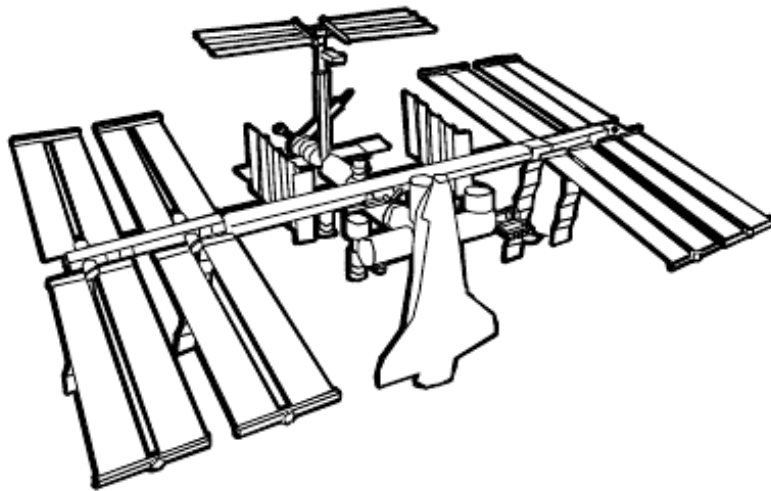
Guides:

Art Production #2

Pathfinders:

Arts from A to Z #11

Galactic Adventures #2, 4



Activity 6: Telescopes

Topic: Astronomy

Suggested branches: Sparks, Brownies and Guides

Time required: About 25 minutes

Girls will make their own telescopes that they can use to see constellations at any time of day.

Give each girl a toilet paper roll and have her decorate it. Once she is done, have her cut out (or pre-cut them) pieces of black construction paper that are slightly larger than the opening. By placing the paper on a Styrofoam plate, girls should be able to easily poke holes through it using a pushpin. They can try to replicate known constellations or create their own.

Supplies:

- Toilet paper rolls
- Black construction paper
- Styrofoam plates
- Pushpins

Once they are done, by pointing their telescope at a light and holding the paper in front of it, they should see the constellations appear.

On the next page you will find some pictures of common constellations.

The Science: Constellations are made up of stars in the sky. The stars aren't actually all that close to each other, but they appear to form pictures when you look at them. Through the seasons, you can see different constellations. Many of them have legends associated with them as well.

Program Connections:

Sparks:

Exploring and Experimenting #4

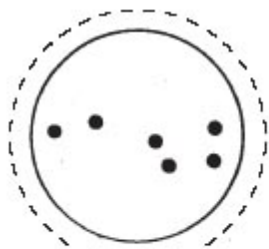
Brownies:

Key to STEM – Reach for the Stars

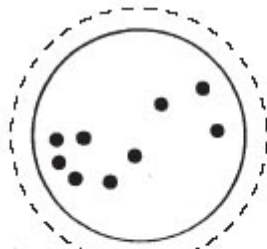
Exploring Space

Guides:

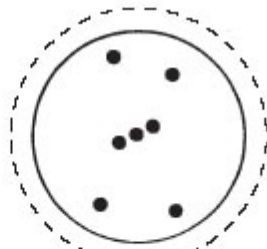
Astronomy #5, 6



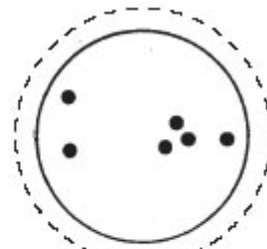
URSA MAJOR,
the Great Bear



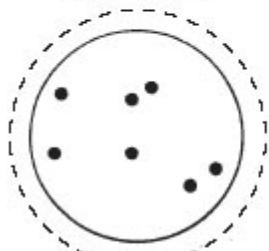
SCORPIUS,
the Scorpion



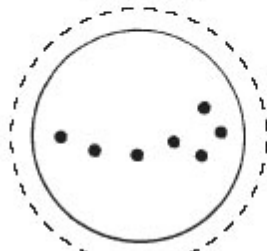
ORION,
the Hunter



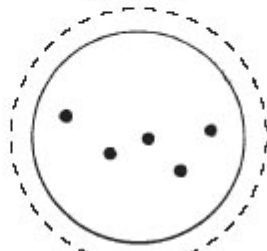
TAURUS,
the Bull



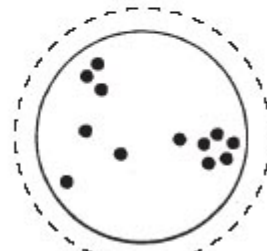
PEGASUS,
the Flying Horse



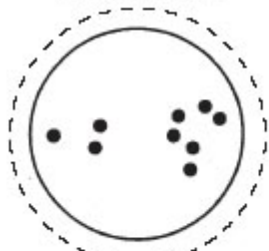
URSA MINOR,
the Little Bear



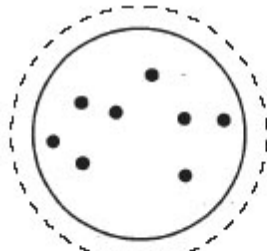
CASSIOPEIA,
the Queen



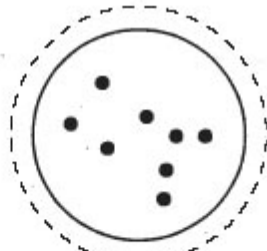
PISCES,
the Fishes



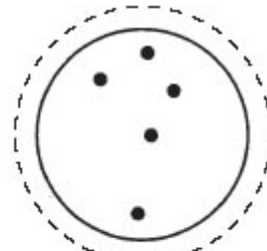
LEO,
the Lion



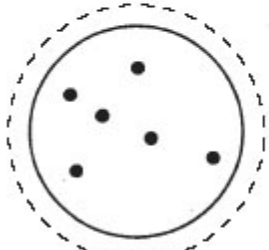
SAGITTARIUS,
the Archer



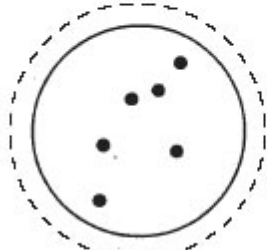
GEMINI,
the Twins



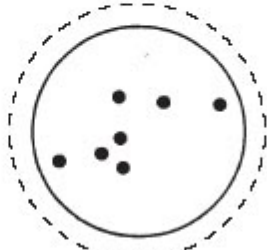
BOOTES,
the Herdsman



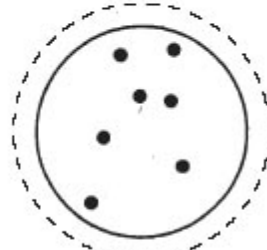
CYGNUS,
the Swan



PERSEUS



CANIS MAJOR,
the Big Dog



HERCULES

Activity 7: Balloon Rocket

Topic: Astronautics and Physics

Suggested branches: Brownies, Guides and Pathfinders

Time required: About 10 minutes

Girls will learn about propulsion and make a rocket move along a string using nothing but air. This activity is similar to Wind Boats.

Have one girl stand holding one end of a long piece of string. Pass the straw through the string and have another girl hold the opposite end. Have another girl inflate a balloon and without tying a knot, tape the side of the inflated balloon to the straw. As she lets go, the straw should travel from one end of the string to the other thanks to the force being created by the air flowing out of the balloon.

Supplies:

- String
- Straw
- Tape

The Science: The force that is being created was named by Isaac Newton as the law of action/reaction. He stated it as: for every action there is an equal and opposite reaction. Thus, as the air exits the balloon, there is an opposite reaction that propels the balloon forwards. The forces are always equal. This means that the more you blow up the balloon, the faster and further the balloon will move.

Program Connections:

Brownies:

Key to STEM – Special Interest Badge

Guides:

Beyond You – Try New Things #4

Engineering #4

Physics #8

Science #5

Pathfinders:

Everything Comes From STEM #6

Activity 8: Fish Life Cycle

Topic: Biology and Fish

Suggested branches: Sparks and Brownies

Time required: About 15 minutes

Girls will learn the fish life cycle through a colouring page.

Have the girls complete the colouring sheet on the next page.

Can they explain what the picture shows?

Can they name any types of fish?

How is the fish life cycle different from that of other animals they know?

Supplies:

- Colouring pages
- Markers or crayons

Program Connections:

Sparks:

Going Outside #4

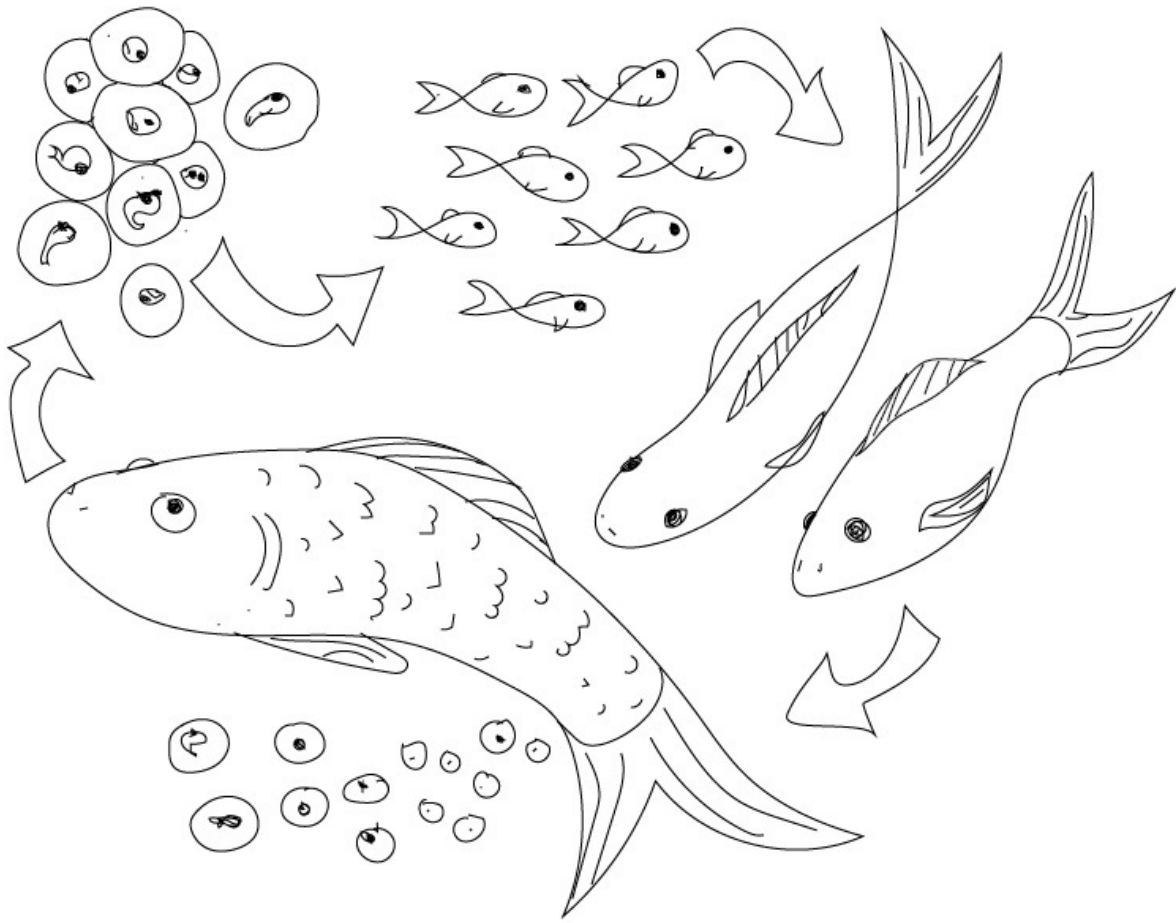
In My Community #3

Brownies:

Wondrous Walks

Key to the Living World – Special Interest Badge

The Life Cycle



Activity 9: Meeting Place Watershed

Topic: Water and Geography

Suggested branches: All

Time required: About 1 hour

Girls will build a watershed in your meeting place and learn about how terrain affects the movement of water and pollutants.

Build a watershed to demonstrate how water flows through the environment:

1. To make the base of the watershed, lay one tarp flat on the ground.
2. To shape the landscape with hills and valleys, ask the girls to crumple bags and scrap paper. Throw them into the centre of the tarp. Try to arrange items closer to the centre of the tarp to keep the edges clear.
3. Ask the girls to spread the second tarp over the items in the middle of the base tarp. Cover all of the items, pushing down between the bumps to create topography. This tarp will act as the surface of the watershed.
1. Line the girls up around the edge of the tarp so that everyone can see the watershed. Pass out spray bottles so that they are spread out around the circle.
2. Ask the girls to imagine that the tarp area is their community. Ask them where the peaks, hills and valleys are on the tarp. If possible, relate these hills to similar recognizable features of your community (ie. nearby large hills, mountains, cliffs).
3. Ask the girls with spray bottles to make it 'rain' on the landscape. Direct the rain towards the centre of the tarp. Experiment with setting the spray bottles to stream/spray to get the desired effect.
4. Once the water begins to run down the slopes and collect in the valleys, ask the rain-makers to stop and discuss what they have seen:
 - What happened when the rain fell on the hills? Where did it go?
 - Where is the water collecting? Do we see any streams, lakes or rivers?

Supplies:

- 2 plastic tablecloths or tarps
- 3 spray bottles, filled with water
- Plastic bags, scrap paper, assorted items to create landscape topography
- Materials to serve as pollutants (you can use any other similar materials): animal waste (brown sprinkles/sand), soil (cocoa powder, real soil), toxic waste (red food colouring), oil from cars (honey/syrup/cooking oil)

- Discuss how topography affects where water flows in the environment. When water falls on a hill, it will follow gravity and flow down the side of the slope. This can mean that rain drops falling on opposite sides of a mountain range will drain away from each other. By determining where the land forces the water to flow, we can define a 'watershed' as an area of land that drains precipitation and runoff into one location. This water can collect in a stream, lake or wetland. The water that moves through a watershed will also transport materials it encounters on the ground surface, including soil, plant nutrients, animal waste and pollutants. Water bodies are therefore vulnerable to pollution from waste found within the local watershed, even if this waste is located far away from lakes or streams.
5. To simulate pollution in the watershed, add 2-3 drops of red food colouring to the top of one of the "hills". Tell the girls that the food colouring represents acid rain. Ask the rain makers to spray again. Watch as the pollutant runs down the slopes and mixes with the clean water in the watershed. Ask the girls to describe what they observed.
 6. Sprinkle the 'animal waste' on the landscape. Tell the girls that the sprinkles represent animal scat or feces in the environment.
 7. Sprinkle the 'soil' onto one area of the tarp. Tell the girls that this area of the community used to contain a forest, but logging of the trees meant that the soil was exposed.
 8. Add a few more drops of red food colouring to the tarp, telling the girls that the dye represents toxic waste. This could represent waste from mining, or hazardous household chemicals that were dumped outside instead of being disposed of properly.
 9. Drip some honey/oil onto the tarp. Suggest that this oil could have leaked from a truck, snowmobile or boat engine.
 10. Ask the rain makers to spray the bottles on the landscape again. Ask the girls to describe what is happening to each of the pollutants:
 - What happened when it rained on the landscape?
 - Where did the pollutants go?
 - Where did the pollutants mix?
 - Did any pollutants remain on the land?
 - What will happen to the pollutants on the land and in the water?
 - Who will the polluted waters affect (plants/animals/communities)?
 - Where do we get our drinking water from?

Expand the discussion

- Discuss the different kinds of pollutants that enter regional water bodies.
- Explore where the drinking water originates in the community. Brainstorm how girls can help prevent water contamination in their watershed.

Program Connections:

Sparks:

Going Outside #4

In my Community #3, 4

Brownies:

Water All Around

Water, Water Everywhere

Saving Water

Guides:

Beyond You – Learn about our Environment #6

Conservation #5

Ecology #4

Water #1,4

Pathfinders:

Our Environment #7, 9

Activity 10: Grass Head

Topic: Plants

Suggested branches: Sparks and Brownies

Time required: About 30 minutes

Girls will paint, plant and take home a pot where they can grow grass seeds at home.

Have the girls paint flower pots so they look like a head.

Fill the pots with soil and plant a few grass seeds in each one. Then water each one a little bit.

Send the girls home with their pots and remind them to water them. As the grass grows, it will look like the pot's hair.

Supplies:

- 1 small flower pot/girl
- Paint
- Soil
- Grass seed

Program Connections:

Sparks:

Going Outside #4

Brownies:

Plant Life

Grow Your Garden

Activity 11: Is the Glass Really Full?

Topic: Water and Surface Tension

Suggested branches: Sparks, Brownies and Guides

Time required: About 15 minutes

Girls will learn about surface tension through an experiment.

For younger girls, this experiment might work better as a demonstration. For older girls, divide them into teams.

Each team will need to fill a water glass all the way to the brim. To avoid having to carry it when it is very full, it might be helpful to fill it most of the way up and then use a second cup to fill it the rest of the way when it is sitting where you want to do the experiment. You want to make sure that it is completely full.

Now, ask the girls whether they think it is possible to add a penny without overflowing? How many do they think you can add? Make a list of the guesses if you want.

Slowly, one penny at a time, see how many you can add.

Once the water overflows, see how the real number compares to their guesses.

Try the whole thing again, but add a couple of drops of dish soap to the water before you begin. How does this change things?

The science: Water molecules have a strong attraction for one another. When they are inside of the glass, they are being attracted from all directions. However, when they are at the surface, they are only being attracted downwards. This creates surface tension. Eventually the volume of water above the rim of the glass becomes too great for the surface tension to hold, and the water will spill. When you add soap, it binds with the water molecules and interferes with the surface tension.

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Key to STEM – Special Interest Badge

Water, Water Everywhere

Guides:

Beyond You – Try New Things #4

Engineering #4

Physics #1

Science #5

Supplies:

- A glass of water
- 50 or so pennies or dimes
- Dish soap

Activity 12: Friction Superglue

Topic: Friction

Suggested branches: All

Time required: About 5 minutes

Girls will test their superstrength and learn about friction.

You can ask 2 girls to get this activity ready while you are doing something else, or have girls do it in small groups.

Supplies:

- 2 notebooks

Take two notebooks and place the pages so that the notebooks are facing each other and that the pages are alternating so that the two notebooks are interwoven. Make sure that you do it one page at a time so that they are properly combined.

Then, have two super strong girls try to pull the notebooks apart by holding the spines and pulling as hard as they can. If the first step was done properly, the notebooks will not come apart no matter how hard they pull.



<http://www.stevespanglerscience.com/lab/experiments/inseparable-books>

N.B. Don't use girls' program books for this because pages will sometimes tear off.

The science: Friction is the force that stops a rolling object from continuing to move forever. A lack of friction makes things slippery. When two objects are exerting forces against each other, there is friction between them. You might correctly think that two pages don't exert much friction against each other, but when that force is multiplied by all the pages in the notebook, it will seem like they are superglued together.

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Key to STEM – Special Interest Badge

Guides:

Beyond You – Try New Things #4

Engineering #4

Physics #3

Science #5

Pathfinders: None

Activity 13: Starburst Geology

Topic: Geology

Suggested branches: Sparks, Brownies, Guides, Pathfinders

Time required: About 15 minutes

Girls will learn about sedimentary, metamorphic and igneous rock, using candy to experiment.

Have teams of girls prepare 3 packages of “rocks.” For each package, they will need to unwrap 3 Starbursts, pile them one on top of the other, wrap the pile tightly in wax paper and then tightly again in tinfoil. It will help to use colours of starbursts that stand out against each other.

Sedentary rocks are created by pressure over time. Have the girls choose one of the packages and press down (with their hands or feet) as hard as they can.

Metamorphic rocks are created through pressure and heat. Choose another package and place it in the toaster oven for 2 minutes. When the time is up, take it out and wrap it in a tea towel. Have the girls press down on it as they did for the first package.

Igneous rocks are created through extreme heat. Place the third package in the toaster oven for 5-10 minutes (until the candy is melted). Don’t let the girls touch this package, as it will be very hot.

Once they are cool, open all the packages and have the girls make observations about what they see. How are the three types of rocks different? How do they think these types of rocks might be formed naturally?

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Key to STEM – Special Interest Badge

Guides:

Beyond You – Learn about our Environment #6

Pathfinders:

It’s About Time #4

Supplies:

- Starburst candies
- Wax paper
- Tinfoil
- Oven mitts
- Tea towel
- Toaster oven

Activity 14: Animal Headbands

Topic: Animals

Suggested branches: Sparks, Brownies and Guides

Time required: About 10-30 minutes

Girls will explore the differences between animals through a game of headbands.

Write names of animals (or print pictures for younger girls) onto slips of paper. Have one girl at a time pick up a slip of paper and without looking at it, hold it up to her forehead. The other girls should be able to see what it says.

Supplies:

- Pieces of paper with names or pictures of animals

Have the girl ask “yes” or “no” questions to try to determine what animal she is holding. If you are short on time and have a lot of girls, you can limit the number of questions or divide them into smaller groups.

Some examples of questions are:

- Would you keep me as a pet?
- Do I live on land?
- Am I a mammal?
- Do I fly?
- Am I usually bigger than *girl holds out arms*?

Ideas for animals (choose ones that are appropriate for the age of your girls): Cat, dog, cow, snake, frog, sheep, horse, pig, fish, whale, dolphin, giraffe, hippopotamus, rabbit, hamster, crocodile, salamander, moose, bird, spider, bee, chipmunk, squirrel, wolf, lion, elephant, beaver, rat, mouse, monkey, bat, bear, kangaroo, fox, raccoon, penguin, goat, lama, owl.

Program Connections:

Sparks:

Going Outside #4

Brownies:

Wondrous Walks

Key to the Living World – Special Interest Badge

Guides:

Beyond You – Learn about our Environment #4

Plants and Animals #5

Activity 15: Honeybee Dance

Topic: Animals

Suggested branches: Sparks and Brownies

Time required: About 15 minutes

Girls will learn about how honeybees use dance to communicate the location of nectar.

Honeybees are excellent and efficient pollinators! Pollination is the transfer of pollen from one flower to another and is how many flowering plants produce seeds. When honeybees visit a plant, they are rewarded with a sugary liquid (nectar) produced by the plant.

Honeybees go out looking for nectar and then return to their hive to tell the others where it is. They can't talk, so they use pheromones (chemical scents) and dances to communicate the location of nectar.

Supplies:

- Construction paper flowers
- A small yellow construction paper circle
- Piece of rope

For flowers that are nearby, they dance in small circles. For flowers that are further away, they do a figure-eight waggle dance that indicates the direction in relation to the sun.

Play a honeybee dance game with your girls:

1. Place construction paper flowers around the room.
2. Make a circle out of the rope to represent the hive.
3. Have all the girls stand in the hive and close their eyes.
4. Choose one girl to hide the small yellow construction paper circle under a flower. She represents the honeybee finding the nectar.
5. When she comes back to the circle, have the girls open their eyes.
6. The girl who hid the nectar must waggle her bum in the direction of the flower.
7. The other girls must all try to guess which flower she chose.

Program Connections:

Sparks:

Going Outside #4

Brownies:

Wondrous Walks

Key to the Living World – Special Interest Badge

Activity 16: Floating Ball

Topic: Air Pressure and Whales

Suggested branches: Brownies and Guides

Time required: About 15 minutes

Girls will learn about whale respiration and create a floating ball toy.

When you see what looks like water coming out of a whale's blowhole, it is really air and snot. As the air is pushed upwards, it displaces the water above it and that is what creates the mist. Although whales spend long periods of time under water, they must hold their breath until they reach the surface. They exhale right before they get there and inhale quickly before diving again.

Have the girls build a floating ball toy and see what they can move with their breath.

Supplies:

- Bendy straws
- Paper
- Tape
- Ping-pong balls or tinfoil
- Clay (optional)

1. Trace a circle on a piece of paper and cut it out.
2. Cut a line to the middle on one side.
3. Fold the sides in so that they form a cone, and tape it closed.
4. Cut a hole in the pointed end just large enough to fit the short end of a straw into it. Once the straw is in, make sure that there is no space on the sides. Use tape or clay to close it up.
5. Place a ping-pong ball or loosely crushed tinfoil ball in the middle of the cone and blow through the straw.



<http://allfortheboys.com/home/2014/06/26/floating-ball-activity.html>

Program Connections:

Brownies:

Key to STEM – Special Interest Badge

Wondrous Walks

Guides:

Discovering You – Discover your Creativity #1

Beyond You – Try New Things #4

Engineering #4

Activity 17: Walking Water

Topic: Plants and Capillary Action

Suggested branches: Sparks, Brownies and Guides

Time required: About 10 minutes

Girls will learn about capillary action through an experiment and find out how water travels through plants.

Fill two glasses with water and ask the girls to choose a primary colour of food colouring for each. Add enough of the food colouring to make the colours nice and bright.

Place the two glasses a little ways apart with an empty glass between them.

Take a sheet of paper towel and fold it in four lengthwise. Place one end in one of the full glasses and the other end in the empty glass. Do the same thing on the other side. You should now have one piece of paper towel coming out of each of the full glasses and two ends in the empty one.

Supplies:

- 3 glasses
- Water
- Food colouring
- Paper towel (the white kind with all of the little holes will work better than brown)

Watch as the water “walks” from one glass to the next until they all have the same amount of water in them. The colours will also mix in the middle so you can talk about how different colours are made by combining the primary ones.

The Science: The water is moving thanks to capillary action. Basically, the water sticks to the tiny pores in the paper towel and moves along it from one end to the next. The cohesive (sticky) force is stronger than gravity and the bonds between the water molecules. This process is also seen in plants, where water travels from the roots up the stem and to the leaves.

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Key to STEM – Special Interest Badge

Wondrous Walks

Water, Water Everywhere

Guides:

Beyond You – Try New Things #4

Beyond You – Learn about our Environment #4

Art Production #3

Engineering #4

Plants and Animals #3

Activity 18: Bird Feeders

Topic: Birds

Suggested branches: All

Time required: About 20 minutes

Girls will make bird feeders to take home to watch birds (and squirrels) throughout the week.

Ice Cream Cone Feeder:

Take an ice cream cone and poke a hole in the end to stick a pipe cleaner through. Bend the pipe cleaner slightly on the inside to keep it in. Roll the cone in Crisco or peanut butter and then in bird seed. Hang it from the pipe cleaner.

Cheerio Bird Feeders:

Thread Cheerios onto 3 pipe cleaners. You can also interspace them with blueberries if you like. Hold the three pipe cleaners in one hand and twist the ends together. Do the same thing on the other end. Then, slightly pull the outer two pipe cleaners away from the center one to space them out. Tie a piece of string to either end so that you can hang your feeder outside.

Toilet Paper Roll Feeders:

Roll an empty toilet paper roll in Crisco or peanut butter and then in bird seed. Thread a piece of string or ribbon through the middle to hang it from.



Citrus Feeders:

Cut an orange or other citrus fruit through the middle. Spoon out the fruit and leave the peel in two cups. Using embroidery thread and a needle, sew through the rind from one side straight through to the next. Then do the same thing perpendicularly. Tie the end of the string to the beginning and leaving slack in order to create two loops by which to hang the bird feeder.

Over the next week, have the girls watch what types of birds they see at their feeders. Have them draw, describe or take photos of them to share at your next meeting.

<http://mamapapabubba.com/2013/04/25/citrus-cup-bird-feeders/>

Program Connections:



Supplies (All):

- Bird seed
- Crisco (or lard), or peanut butter

Ice cream cone:

- Pipe cleaners
- Ice cream cones

Cheerio:

- Cheerios
- Blueberries (optional)
- Pipe cleaners
- String

Toilet Paper roll:

- Toilet paper rolls
- String

Citrus:

- Citrus fruit
- Embroidery thread
- Needles

Sparks:

Going Outside #4

Brownies:

Bird Watchers

Guides:

You in Guiding – Be Involved #4

Beyond You – Learn about our Environment #4

Bird Watching #7

Pathfinders:

Up Close and Personal with Nature #8

Activity 19: Lungs

Topic: The Human Body

Suggested branches: Guides and Pathfinders

Time required: About 15 minutes

Girls will build a lung and understand how their lungs and diaphragm work together when they breathe.

1. Take a 2 litre pop bottle and cut off the bottom
2. Tie a knot in the mouth of one balloon and cut off the top of the balloon. Stretch the cut end over the water bottle where you cut off the bottom of the bottle.
3. Take your straw and insert it in the mouth of the second balloon. Tie it closed with an elastic band.
4. Place the balloon and part of the straw into the top opening of the pop bottle. Hold it in place with clay.
5. Hold the bottle and pull down on the knot on the balloon at the bottom. You should see the inner balloon inflate.

Supplies:

- 2 balloons
- 2 litre pop bottle
- A straw
- Clay
- An elastic band
- Scissors

The Science: As you pull on the bottom balloon, it increases the space in the bottle. Air comes through the straw at the top and into the inner balloon to fill the empty space. As you let go of the balloon, the amount of space decreases and the small balloon returns to its original size.

Your lungs and diaphragm work in the same way. When you breathe, air passes through your windpipe and down to your lungs as your diaphragm moves down to make room. When you exhale, your diaphragm moves upwards again and air comes back out through your mouth.

<http://www.science-sparks.com/2012/04/13/breathing-making-a-fake-lung/>



Program Connections:

Guides:

Body Works #1

Pathfinders: None

Activity 20: Mystery Tube

Topic: The Scientific Method and Models

Suggested branches: Guides and Pathfinders

Time required: About 20 minutes

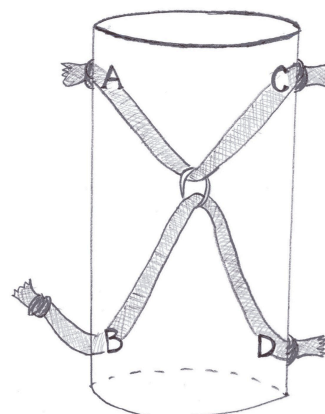
Girls will learn about how scientists use models to try to explain concepts that they cannot see.

Before the meeting begins, prepare enough mystery tubes for groups of 3-4 girls.

1. Using a pencil or other sharp object, make 4 holes in your paper towel rolls: 2 across from each other near the top and 2 across from each other near the bottom
2. Feed the 2 pieces of rope or string through the keychain ring so that one piece goes in and out at the top and one piece goes in and out at the bottom. The size of rope and ring you choose should let the rope move easily
3. Feed each end of the rope through one of the holes in the paper towel role
4. Duct tape the top and the bottom of the rolls so that your girls cannot look inside

Supplies:

- Paper towel rolls (or PVC tubes for more durability)
- Keychain ring
- Rope or string
- Duct tape



In teams, have the girls try to guess what it looks like inside the tube. Have them experiment with pulling on the different ends. What moves? Have them try to draw a diagram of what's inside. Is there a knot? How many pieces of string are there? How are they connected?

http://www.teacherlink.org/content/science/class_examples/Bflypages/timelinepages/nosactivities.htm

The Science: Scientists study many things they cannot see. Some are too small, some are too far away, some are dangerous and some happened long, long ago. In order to try to understand them, they create models to test. Although they cannot be 100% certain that their models are correct, they can hypothesise about their accuracy and experiment with them.

Scientists use the scientific method: They ask a question, do research, make a hypothesis, test the hypothesis, make conclusions and report their results. Your girls could do the same by building their own versions of the mystery tubes. Without knowing what's inside, they could do research by pulling on the ropes, hypothesise about what's inside, build their hypothesis and then see if it works the same way.

Program Connections:



Guides:

You and Others – Build Skills in Communication #6

Beyond You – Try New Things #4

Engineering #4

Physics #8

Science #5

Pathfinders:

Everything Comes From STEM #1

Activity 21: Water Wheel

Topic: Hydro Energy

Suggested branches: Brownies and Guides

Time required: About 20 minutes

Girls will build a water wheel and see how water creates energy.

The building can be done in patrols or as a unit. Testing the wheel should be done outside or somewhere you don't mind getting wet.

1. Tape 2 plates back to back.
2. Lay a piece of tape sticky side up and tape small plastic cups or cut-out egg carton cups to the tape. The cups should all face in the same direction.
3. Wrap the cups around the edges of the plates and use more tap to secure the strip.



4. Create a second set of two taped plates but do not wrap it with cups.



http://howto.wired.com/wiki/Build_a_Plastic_Cup_Waterwheel

Supplies:

- Styrofoam or thick paper plates
- Straws
- Tape
- Small plastic cups or egg cartons
- Jug of water
- String
- Small weight that can be tied to the end of a string (whatever you have on hand)

5. Stick a straw through the middle of the plates to make a hole. Tape the straw to the plates so that it doesn't turn. Thread a piece of string through the straw.
6. Have two girls hold one end of the string each and pull it taut.
7. (Optional) Tape a piece of string to the plates without cups and wrap it around a couple of times. Let the end dangle to the ground and attach your small weight to it.
8. Have one girl stand over the cups and pour water in. Notice that the faster she pours, the faster the wheel turns. As the whole thing turns, if it is going in the right direction, it will lift the small weight.

Program Connections:

Brownies:

Making Things Go

Water, Water Everywhere

Guides:

Beyond You – Try New Things #4

Engineering #4

Physics #8

Science #5

Activity 22: Wind Boats

Topic: Polymers and Heat

Suggested branches: All

Time required: About 30 minutes

Girls will build boats and use the power of air to move them.

Option 1: Balloon Boats (This activity is similar to *Balloon Rocket*)

Have girls use basic materials to create a boat. Have them attach an inflated (but not tied) balloon to the back of it. When they let go of the balloon, which boat goes furthest? Why?

Option 2: Wind Boats

Give the girls some basic materials and have them build a boat. Can they create a shape that will catch the wind? Have them race their boats by blowing on them. What shapes worked best? What didn't work so well?

The Science: Wind turbines have large blades that move in the wind and harness clean and renewable energy to turn it into the electricity that we use. The shape of the blades is important so that they will catch the wind and turn.

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Making Things Go

Key to STEM – Special Interest Badge

Guides:

Discovering You – Discover your Creativity #6

Beyond You – Try New Things #4

Engineering #4, 5

Physics #8

Science #5

Pathfinders:

Everything Comes From STEM #6

Supplies:

- Large basin filled with water for testing
- Building materials such as straws, duct tape, paper clips, paper, popsicle sticks, Styrofoam plates, and whatever you have in your recycling bin.

Activity 23: Salt and Sugar Crystals

Topic: Crystals

Suggested branches: All

Time required: About 30 minutes over 2 weeks

Girls make crystals out of salt and sugar and watch them grow over a few weeks.

1. Set the kettle to boil and split the girls into a few groups.
2. Give each group a styrofoam cup and a popsicle stick.
3. Give half the groups $\frac{1}{2}$ a cup of sugar and half the groups $\frac{1}{2}$ a cup of salt.
4. When the kettle boils, pour $\frac{1}{2}$ a cup of water into each of the groups' empty styrofoam cup and have them slowly pour in some of their salt or sugar, stirring as they do so. Have them slowly keep adding sugar/salt until they see that no more is dissolving in the cup. If you want, you can add a few drops of food colouring to each cup so you know which is which. Alternatively, you can simply label them.
5. Transfer the now cooler liquids into plastic cups.
6. Give each group another popsicle stick, a piece of string and a paperclip. Tie the paperclip to one end of the string, then wrap the other end around the popsicle stick so that the paperclip doesn't quite touch the bottom of the cup when the popsicle stick is placed horizontally across the opening of the cup.
7. Move the cups onto a tray or some surface where you can leave them undisturbed until the following week.
8. After a week (or more) has passed, take the cups back out and take a look at the crystals. Use a magnifying glass to see what they look like up close. Do you notice a difference between the salt and the sugar ones?

Supplies:

- Salt
- Sugar
- String
- Clear plastic cups
- Styrofoam cups
- Popsicle sticks
- Paper clips
- Kettle
- Oven Mitts
- Tray (optional)
- Magnifying glass
- Food Colouring
- Measuring cups

The Science: A saturated solution is one where no more of a solute can be dissolved. In this case, the solute was the salt and sugar. We increased the amounts that could be dissolved by heating and stirring. Over the course of the week, crystals formed on the string and stuck to each other as the water evaporated and the solute precipitated (separated) back out of the water. Salt crystals are cube shaped and have six sides. Sugar crystals are very rough looking and are shaped more like rectangles with pointed ends. Crystals are more

common than you might think because the word crystal refers to any matter that is arranged in an ordered form. For example, snow also forms crystals.

Program Connections:

Sparks:

Exploring and Experimenting #4

Brownies:

Key to STEM – Special Interest Badge

Guides:

Beyond You – Try New Things #4

Physics #8

Science #5

Pathfinders: None

Websites

Montreal

Space for Life (Biodôme, Botanical Garden, Insectarium and Rio Tinto Alcan Planetarium): espacepurlavie.ca/en

Ecomuseum: zoocomuseum.ca/en/homepage

Montreal Science Centre: montrealsciencecentre.com/

Laval

Cosmodôme: cosmodome.org/en/home

C.I.Eau: cieau.qc.ca/

Musée Armand-Frappier: musee-afrappier.qc.ca/en/

Shawinigan

La Cité de l'énergie: citedelenergie.com/en/index.aspx

Saguenay-Lac-Saint-Jean

CIBRO: cibro.ca

Zoo Sauvage of Saint-Félicien: zoosauvage.org/en

Sherbrooke

Sherbrooke Nature and Science Museum: naturesciences.qc.ca/en/museum/

Eastern Townships

Pavillon de la Faune: en.pavillondelafaune.com

Tadoussac

Centre d'interprétation des mammifères marins: baleinesendirect.org/gremm/

Charlevoix

Pointe-Noire Interpretation and Observation Centre: parcmarin.qc.ca/home.html

St-Louis-du-Ha-Ha

ASTER: asterbsl.ca/en/

Notre-Dame-des-Bois

Astrolab: astrolab-parc-national-mont-megantic.org/en/

Richelieu

Centre d'interprétation des énergies renouvelables (CIER): energie-richelieu.com/fr/accueil_7.html

Sainte-Julie

Électrium: hydroquebec.com/visit/monteregie/electrium.html

Sorel-Tracy

Biophare: biophare.com/index.html

Arundel

Arundel Nature & Science Centre: natureandscience.ca/en/Welcome_10

Bonsecours

Mine Cristal: minecristal.com/portail.php

Thetford Mines

Musée minéralogique et minier de Thetford Mines: museemineralogique.com/

Malartic

Musée minéralogique de l'Abitibi-Témiscamingue: museemalartic.qc.ca/home/

Bécancour

Centre de la Biodiversity du Québec: biodiversite.net/home

Program Work Completed

Which program work you complete will depend on which topics you chose to explore. Here are some of the areas you might have covered. Badges with an asterisk are not explicitly covered in any of activities in this document but could be covered depending on the locations you visit:

Sparks:

Going Outside
In my Community
Exploring and Experimenting

Brownies:

Reach for the Stars!
People in Science*
CABOOSH!*
Key to STEM – Special Interest Badge
Exploring Space
Making Things Go
Wondrous Walks
Plant Life
Water All Around
Grow Your Garden
Bird Watcher
Water, Water Everywhere
Key to the Living World – Special Interest Badge

Guides:

You and Others – Build Skills in Communication
You in Guiding – Be Involved
Discovering You – Discover Your Creativity
Beyond You – Try New Things
Beyond You – Learn About our Environment
Art Production
Astronomy
Bird Watching
Body Works
Chemistry*
Conservation
Ecology
Endangered Species*
Engineering
Forestry*
Gardening*
Healthy Eating*

Naturalist*
Physics
Plants and Animals
Provincial/Territorial Heritage*
Science
Water

Pathfinders:

Up Close and Personal with Nature
Arts from A to Z
It's About Time
Galactic Adventures
From Dinosaurs to Vintage Cars*
Our Environment

Rangers:

Energy Check
Falling From the Sky
Our Local Environment
Get Involved
Slipping Away
Water, Water Everywhere
For the Birds
The Science of Art*
Health Sciences

This Challenge was created with the help of some of the students in the Science Communication graduate program at Laurentian University in 2015.