

BACKYARD SCIENCE

Nature, discovery, science, and fun are the common elements in these late summer activities.

by Donald Fraser



Photo:Gerrit Weatherbee

This August, your kids could be having a blast at home, in your backyard, or in and around your neighbourhood. What's more, they could be gaining a foothold on next year's curriculum, stretching their imaginations, and gaining a better knowledge of the world around them.

How? With a smattering of science, the bounty of nature, and the advice of experts. Here are their suggestions for activities to keep kids engaged, learning, and having fun this summer.

1. Build A Weather Station

I found Krista Campbell, a science teacher in Cobourg, in her classroom amid a jumble of pop bottles, balloons and Dixie cups.

"It's a weather station," she explains, as I look on with a puzzled expression.

And indeed, it is. A rather easy-to-build one at that, as it turns out. It is as simple as gathering (or making) these instruments:

- * a thermometer, to measure temperature
- * a rain gauge, to measure precipitation
- * a weather vane, which indicates which way the wind is blowing
- * a barometer, to measure air pressure – changes indicate a change in weather
- * an hygrometer, to measures humidity (that is, the amount of moisture in the air)
- * an anemometer, to determine wind speed.

Campbell says the project is a great activity for kids to do at home. You'll find instructions for making a weather station and most instruments at www.fi.edu/weather/todo/todo.html.

With a weather station, your child can become a junior meteorologist, keeping tabs on daily weather conditions and identifying factors that affect the weather.

Once a day, at the same time, your child should take measurements from all the instruments in the weather station and record it in a journal. "An integral part of science is documenting your observations," explains Campbell. "Documenting leads to the cool part of science where you get to compare your results and the patterns that begin to form – and the even cooler part of science where these patterns allow you to predict results." Being able to predict the coming weather is a handy talent for any kid to have!

If you want to make this project really special,



Photo:Gerrit Weatherbee

have your child do a regular weather forecast for the family. A news desk and microphone will add to the fun!

2 Become an Aquatic Explorer

The next person I chased down was Peterborough Green-Up's Brianna Salmon. Salmon, fortunately enough, was in the process of getting activities together for a school group when I found her at Ecology Park.

Salmon suggests encouraging kids to be aquatic explorers. "Go to a local stream, pond, or wetland and take a really close look at what is present. A quick stream study will reveal a host of life, from the tiniest of hydras and flatworms, to insects that exist in, on, and over the water, to larger species of fish and frog." (A good stream guide can be found at www.ecospark.ca/sites/default/files/currents/ID_guides.pdf.)

Kids can track the growth of bugs from aquatic larvae to mature insect, or frogs from tadpole to maturity. Keeping a detailed journal is a good idea.

To get a better sense of the aquatic habitats that different creatures prefer it's best for kids to explore at various water clarity levels and depths. To see below the water, kids can make their own underwater scopes. Here's an easy one.

Take a large, empty can (a juice can will do nicely). Cut off both ends and tape a piece of cel-

To automatically link to the websites in this article, go to www.peterboroughkids.com and click on the virtual issue.



lophane over one end. Make sure the cellophane is tight and water proof. Your child will get amazing views of the aquatic underworld by placing the cellophaned end into the water and looking through the open end (keeping this above water level).

For those who want a nifty toy for examining the creatures in their aquatic worlds, an inexpensive (\$5-\$15) viewfinder is ideal. The top lens enables you to view specimens from above while the lower lens lets you view specimens from the underside. Viewfinders “offer hours and hours of learning,” says Salmon, and are great for aquatic environments because they can hold water. So your kids can examine tadpoles, dragon fly larvae, or even water fleas.



Photo: Grant Weatherbee

3. Build a Solar Oven

My next stop was Camp Kawartha in Lakefield, where I talked with executive director Jacob Rodenburg about another fun project for kids: building a solar oven.

“When you tell kids that they can cook nachos using only the sun’s energy and a few items found around the house, they are naturally intrigued. Especially since the end product is a tasty treat,” says Rodenburg.

But Rodenburg says pizza box solar ovens appeal to kids for another reason too. “Showing children how to make use of renewable energy resonates with them,” he says. “They recognize that the way

our generation is consuming fossil fuels simply cannot continue. In the words of one child, ‘It’s just plain dumb – it doesn’t make sense.’”

Solar ovens demonstrate the principle of passive solar design – the concentration of the sun’s energy to a point where change is created in the object receiving the energy – in this case, food. “This basic principle is used in designing energy efficient homes,” says Rodenburg.

Pizza box solar ovens are simple to make and “work beautifully,” says Rodenburg. “They take less than an hour to build.” (See sidebar for detailed instructions.)

And then you can start cooking. “At camp, our favourite thing to cook is nachos (cheese melts nicely with the sun’s rays),” says Rodenburg. “You can also cook English muffin pizzas, cookies, muffins, s’mores – just about anything you can cook in a conventional oven. However, be careful cooking meat, says Rodenburg. “You always want to make sure food is properly cooked before consuming it.”

4. Create Giant Bubbles

“We’ve had an amazing time making giant bubbles at camp,” says Rodenburg about his second suggestion for a summer science activity. “Some of them were more than three feet in diameter!” All it takes is a homemade soap solution and a homemade wand. (See sidebar for both.)

Kids love to compete to see who can make the biggest bubble and whose bubble lasts the longest, says Rodenburg. “It’s exciting to blow huge bubbles on a moist day (when bubbles form best) – they’ll stay fully formed for more than 40 seconds.”

Kids are fascinated by bubbles not just because of their play value, but because of their form, shape, and colours. There is “some really neat science behind bubble-making,” says Rodenburg. Here’s one take on it:

“Bubbles form because of the surface tension of water. Hydrogen atoms in one water molecule are attracted to oxygen atoms in other water molecules. They like each other so much, they cling together. Normal bubbles enclose the maximum volume of air with the minimum amount of bubble solution, so they are always round. When you stretch your bubbles across contraptions [like a rod and string wand or a hula hoop] bubbles cling to the sides as you dip into the solution, making the bubbles all sorts of shapes.” (Source: www.stevespanglerscience.com/experiment/giant-bubble-experiment.)



How to Make Giant Bubbles

All you need to make giant bubbles is soap solution and a wand.

Here is the basic recipe for your bubble solution. You’ll need:

- 2/3 cup liquid dish detergent
- 1 tablespoon glycerin (available at food or drug stores)
- 1 gallon of water

For variations on this recipe, go to www.tooter4kids.com/Bubbles/Activities_Recipes.htm.

Mix all ingredients in a bowl, pail or container that will accommodate the size of your wand.

Wands for making giant bubbles can be made from a variety of things, such as:

- a paper cone (www.zurqui.com/crinfocus/bubble/tube.html),
- wire coat hangers (www.ehow.com/how_2084_make-giant-bubble.html?ref=Track2&utm_source=ask)
- a hula hoop (www.groundwater.org.kc/activity9.html)
- cotton string and straws (www.creativekidsathome.com/activities/activity_5a.html#Giant%20Wands)

But according to Jacob Rodenburg of Camp Kawartha “the wands that have worked best for me are made out of a rod and either rope or webbing.” Here’s a website you can go to for instructions on how to make this type of wand: www2.uvawise.edu/netsacs/Documents/ncw/2005/Make%20Your%20Own%20Giant%20Bubble%20Wand.pdf.

To find out where bubbles get their amazing colours from go to www.exploratorium.edu/ronh/bubbles/bubbles.html.

Plenty to do

Thanks to our experts, your kids have plenty of fun ahead of them. And who knows? Maybe these activities will be the spark that turns one of them into a budding scientist or environmentalist!

Donald Fraser is a freelance writer and consultant, specializing in air quality and climate change issues.

Pizza Box Solar Oven

The pizza box solar oven can reach temperatures of 275 F, hot enough to cook food and to kill germs in water. A general rule for cooking in a solar oven is to get the food in early and don’t worry about overcooking. Solar cookers can be used for six months of the year in northern climates and year-round in tropical locations. Expect the cooking time to take about twice as long as conventional methods, and allow about one half hour to preheat.

What You’ll Need

- Recycled pizza box
- Black construction paper
- Aluminum foil
- Clear plastic (heavy plastic laminate works best)

- Non-toxic glue, tape, scissors, ruler, magic marker
- Wooden dowel or straw

How to Make Your Pizza Box Oven

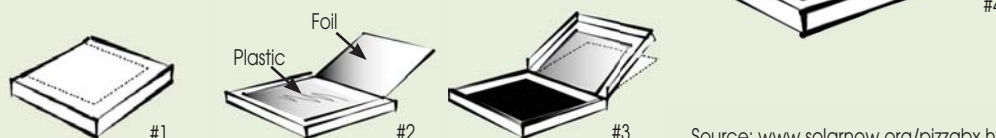
1. Draw a one inch border on all four sides of the top of the pizza box. Cut along three sides leaving the line along the back of the box uncut.
2. Form a flap by gently folding back along the uncut line to form a crease. Cut a piece of aluminum foil to fit on the inside of the flap. Smooth out any wrinkles and glue into place. Measure a piece of plastic to fit over the opening you’ve created by forming the flap in your pizza box. The plastic should be cut larger than the opening so that it can be taped to the underside of the box top. Be sure

the plastic becomes a tightly sealed window so that the air cannot escape from the oven interior.

3. Cut another piece of aluminum foil to line the bottom of the pizza box and carefully glue into place. Cover the aluminum foil with a piece of black construction paper and tape into place.
4. Close the pizza box top (window), and prop open the flap of the box with a wooden dowel, straw, or other device and face towards the sun. Adjust until the aluminum reflects the

maximum sunlight through the window into the oven interior.

Your oven is ready!



Source: www.solarnow.org/pizzabx.htm