

Creating Scientists of Tomorrow!

By Shar Levine

Welcome back to a new year at school. You are probably as excited as your students are to get back to the classroom. As you begin to plan your lessons, take a moment to consider some new ways of looking at science, and in particular hands-on activities.

Children love science. They love to see how it relates to their everyday lives. When asked how they got their start, many famous scientists say that they had science hobbies when they were children. Some had chemistry sets, microscopes, or telescopes, many collected rocks or stones, while others made crystal radios. These scientists began exploring, measuring, observing and categorizing when they were young.

Children don't suddenly begin to love science when they are in university. That fascination or inspiration can start with a teacher when they are in elementary school.

But here's the problem: if science isn't your favourite subject, it probably won't be your student's favourite subject. Many educators don't have strong backgrounds in science and they may feel overwhelmed when it comes to teaching the subject. They feel more comfortable with language studies, art, geography, or history. Are you the kind of educator that feels that science is intimidating or unknown territory?

Now, let's take a moment to consider the text books you are using in your classroom. History doesn't change. Confederation was 1867 and WW1 ended on Nov. 11th 1918. The capital of Canada is Ottawa, and any book that has that in it will not need to be replaced. A dangling participle will always be a dangling participle; however, science changes, and it changes quickly.

But.... And here's the really important thing, the science text books don't change. Schools may buy new science books once every 10 or even 15 years. And, don't forget, it may have taken several years to write the text. The science in these books may be 20 years old. Consider this:

Fifteen years ago, there weren't that many people on the internet. People who were surfing the net used dial up connections. Cell phones were huge and expensive. The cheapest digital camera only took photos with 2 mega pixels and those cameras cost a thousand dollars. Ipods, iPhones and iPads had not been invented and the first hand-held video game players were just released.

We have reached an age with huge leaps in technology that occur on a daily basis. So how do you teach science when you don't have a strong background in it, the texts that you are using are out of date, and you have students who may be more internet savvy than you? How do you help create the scientists of tomorrow?

The internet can be your best and sometimes your worst friend. Look to kid-friendly and legitimate web sites from universities, schools and science museums to help you find up to date and interesting science activities. Check out www.scienceinseconds.com for some great science videos. Or if you have internet access in your classroom, check out Brain Pop for fun science facts. If you have any doubts about the information on the internet, make certain you check with several sources before trying an activity.

It's really not that difficult to become a science cheerleader. It's all about attitude. Science is fun and if you can inspire children to take an active interest, then the rest is easy. It is not important that you know all the answers. It is important that you help your students ask the questions and find the answers.

What you teach children today will help influence who they will be as adults. And despite the popularity of certain books, not a single child will ever grow up to be a wizard or a vampire.

Have a great year. Make science activities part of your classroom and not just

book work. Turn science a "verb". Remember: the children in grade 1 today will be employed as adults in professions that have not yet been invented and MANY of those jobs will be in science and technology.

Here are some simple things you can do in your classroom to spark an interest in science.

1. Weather

Accuweather (www.accuweather.com)

Print out the forecast for the week and have student create a chart to see how closely the weather prediction matched what temperature or weather conditions actually occurred. Hang an outdoor thermometer by the classroom window. Measure the temperature outside each day, and see how often the predictions were correct. Create a graph of the highs and lows each day and the time it was recorded.

Thunder and lightning activity

Blow up a paper bag and burst it to show how sound is made. Or when the weather is dry, create a static charge by blowing up a balloon, rubbing it over a child with long, clean hair, and watching how the hair raises and sticks to the balloon.

Make a rain gauge and measure the rainfall. Create a graph showing the amount of rainfall each day. What is the difference between a cm of rain and a cm of snow?

In the winter you might want to take measurements of snow and create snow gauges to measure the snow fall. You could even melt the snow to show how some kinds of snow have more water content than other kinds of snow.

Hang a picture of different types of clouds and see who can match the picture to the clouds in the sky.

Wind vane – record which way the wind is blowing at the same time each day.

2. Make a sundial.

Have students use a stick and rocks to create their own sundial. You can even have children take turns being a gnomon (the part of the sundial that sticks up) and the hour markers. Make different kinds of sundials and compare the time on the sundial to the time on your watch. Don't forget to adjust the time for longitude. You can find simple directions on making sundials by Googling "sundials".

Ask children what "A.M." and "P.M." means. Ante Meridian Latin = "before midday", P.M. Post Meridian Latin = "after midday"

Great Canadian Scientist– Sir Stanford Fleming and time zones. Have children write an story about Sir Stanford Fleming and his creation of time zones. Why are time zones important and what made him create time zones?

3. Biodiversity

Walk out to a grassy section of the schoolyard and measure off 1 sq metre. Have the children draw or record all the different animals, plants, or other things they see living in that area. Don't forget to lift rocks.

Study different areas around your school. What different things can you find?

4. Bird watching

Here's how to create ornithologists in your class and you won't have to leave the school. You can have children draw or you might even photograph the different birds that visit your feeders.

Bird feeder – make suet feeders and hang for birds, great for fall and winter.

Bird bath – make one for outdoors by inverting a large clay pot and putting a large rimmed plate on top of the pot.

Bird identification – have a book on hand, look for footprints and document what you see or use a digital camera to photograph birds in your area. Do the kinds of birds you see change with the season?

Have a designated ornothologist each day.

Bring in feathers and pictures of eggs

Study eggs. Roll an egg and see where it goes (in circles).

Why eggs are egg shaped and how to test the strength of eggs. Find 4 identical egg cups and place an egg in each one. Position the cups with the eggs so that you can rest a book on top of the 4 points of the eggs. Gently put a book on the eggs.

5. Worm Composter

Do something good for the environment and have a science lesson at the same time. Make a worm composter for the classroom and get rid of leftover fruit, vegetables, bread and other lunch items. Study worms and use the compost mixture to grow plants in the classroom.

Use a magnifying glass to look at the segments and to watch how a worm breathes.

Find out if worms like fruits more than vegetables. Place vegetables on one side of the composter and fruit on the other. Which gets eaten first?

Put a worm on a piece of aluminum foil and listen to it move.

6. Seasons

Here is something that is easy and inexpensive to introduce into your classroom. Start a collection related to each season. In the fall, you could create a display of leaves showing the different shapes, sizes and colors, with labels showing the kind of tree the leaf came from. Each child could even start their own book. If you have a digital camera, you can even take photos of a deciduous and a coniferous tree throughout the school year and document how the tree changes throughout the seasons.

7. Surprise!

And now for a special October treat.

Scary Science, Scholastic Books, is the latest book written by my writing partner, Leslie Johnstone and me. Here is one chapter that did not make it into the book because of space. Check out this great hands-on science book when it comes out this fall!

Jack O'Lantern–

From the original manuscript of Scary Science, by Shar Levine and Leslie Johnstone, Scholastic Books Canada (2010).

Unless you are frightened by the idea of the tooth fairy sneaking in to steal your teeth, Halloween is probably the scariest thing that happens to you each year. Have you ever helped carve a pumpkin to make a Jack O'Lantern for Halloween? If you have, then you have been part of a very old tradition. In Britain and Ireland lanterns were made when coals were placed into carved turnips. When colonists reached America they began to use pumpkins instead, and we have been carving them ever since. Let's see what makes pumpkins such a special fruit.

You Will Need

Washable marking pen

Pumpkin

Knife (to be handled by an adult)

Metal spoon

Two bowls

Tea light (either a battery operated one, or if the candle type have an adult light it and supervise)

Oven, cooking oil, salt, cookie sheet (optional)

Small container with potting soil and water (optional)

What To Do

1. Use a marking pen to draw a circle with about a 6 inch (15 cm) diameter around the stem of the pumpkin. Then draw shapes for the eyes, ears, nose, and mouth. Don't forget to add scary teeth and maybe a scar or two if you like.
2. When you are satisfied with your design have an adult cut around the circle you drew on a 45 degree angle to remove the top of your pumpkin.
3. Use your spoon to scrape the seeds and pulp out of the inside of the pumpkin. Put the insides of the pumpkin into one bowl, and carefully remove the seeds to place in the other bowl.
4. When the inside of the pumpkin is clean and smooth have an adult cut out the eyes, ears, nose and mouth you drew. Place a tea light inside the pumpkin

and look at it in a dark room. Did you make it very very scary?

5. If you like you can roast the pumpkin seeds. Just toss them with about 1 tablespoon (15 mL) of cooking oil and sprinkle on some salt. Spread the seeds on a cookie sheet and have an adult cook them in a hot oven (about 425 degrees F) stirring them every five minutes until they become brown and toasted. Let them cool a little then enjoy!

6. If you don't want to cook the seeds you could try planting a few of them to grow new pumpkins. Put some potting soil in a small container with a drainage hole in the bottom. Poke a few holes about 1 inch (2.5 cm) deep in the dirt with your finger and place a seed in each hole. Cover them with soil. Water the container a little every day and watch the seedlings appear. When they have a few leaves on them you can move them to the garden or a larger pot.

WOW! What Happened?

You made a Jack O'Lantern! Pumpkins, like their cousins the zucchini are members of the cucurbitaceae family of squashes. What makes pumpkins so terrific for carving is their size (some of them can weigh more than 1000 lbs. (450 kg)), and their thick orange skin. At one time the skin was cut off the fruit, pressed, and made into floor mats so as you can see it is very strong. If you don't pick the pumpkins their flesh rots which gives the seeds lots of nutrients so that new pumpkins can grow every year. The seeds have a thick outer husk that protects the delicate seed inside until it is time for the seeds to **germinate** or begin to grow into new plants.

Did You Know?

There was a Jack that gave his name to the Jack O'Lantern. In an old Irish legend it was said that Stingy Jack tricked the Devil into refusing to accept his soul when he died. He was such a bad man that he was also refused entrance to heaven so he was condemned to wander the world until the end of time. The Devil took pity on Jack and gave him a burning coal in a carved out turnip to light his way. Jack became called Jack of the Lantern, or Jack O'Lantern. Carved pumpkins with scary faces are supposed to scare Jack away.

Editors Note: Check out Shar's website at www.sciencelady.com.