



Photos: Allan Foster

Roots of Diversity:

Growing Culturally Significant Plants in the Classroom

by **Allan Foster**

OVER THE LAST THREE YEARS, I have conducted a number of workshops to provide teachers with the materials they need to establish window-sill gardens in their classrooms. During this time, the staff at a local outdoor education centre helped me establish an indoor demonstration garden in the windows of the entrance corridor. We have witnessed that students are drawn to the display not just by the diversity of plants but also by the labels that indicate their countries of origin and the related cultural celebrations. Although I'm a botanist, I have come to understand that the biology of a plant is not nearly as interesting to students as its stories and cultural connections. Somehow, the facts that a marigold has fibrous roots and is a member of the Composite family are not so engaging as the fact that the plant traveled 400 years ago from Brazil to India on sailing ships with Portuguese sailors who barely escaped pirates lurking on the high seas.

Plants play important roles in many cultural traditions and rituals around the world. Consequently they are useful resources when studying different cultures. Many jurisdictions in North America are welcoming ever increasing

numbers of newcomers into their communities, and one of the goals of most public education systems is to develop in students esteem for the customs, cultures and beliefs of a wide variety of societal groups. Celebrating our diversity by growing culturally significant plants may be one way of achieving this goal.

As educational resources, plants grown in the classroom can engage students in many other ways as well. Plants can serve as living specimens for measurements, science experiments and demonstrations. They provide raw material and inspiration for art and photography projects. Because they originate from all over the world and have rich histories tightly bound to human societies, plants provide valuable links to geography, history and social studies. Because they are living and depend on the natural resources of sunlight, water and soil nutrients, plants grown in the classroom teach valuable lessons about the environmental imperative and provide opportunities for students to develop a connection with the natural environment. Plants grown in the classroom can also be bridges to folklore, poems, plays, stories, novels and current events in which plants play decisive roles. For example, plants such as the Whomping Willow and the villainous Mandrake have starring roles in the adventures of Harry Potter.

The following tips and suggestions are offered in the hope of persuading you to try growing plants in your classroom to celebrate the cultural diversity of our communities — not to mention the diversity of plants.

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them, use them in a classroom study, and eventually take them home on the appropriate day as a gift to share with family.

Like the plants themselves, the equipment and materials needed to care for them are inexpensive. You can easily carry out your whole project using yogurt containers as pots. You may wish to buy a clever

Getting started

When you embark on this project, you and your students will be propagating plants. We usually think of seeds when we consider starting new plants, but you can demonstrate in your classroom how new plants can be formed from roots, bulbs, stems or leaves. The good news is that it won't cost you very much. Plant propagation is a time-honoured strategy developed by generations of farmers and gardeners to grow new plants from old ones in order to save money. Often, you can buy one plant, carefully divide it into several living pieces and share those pieces with your students so that they can start them, nurture

little wooden device that turns scraps of newspaper into biodegradable pots for starting young plants.¹ You can also buy biodegradable peat pots at a dollar store, along with handy, tiny plastic shot glasses and paper cups. You can mix your own potting soil and enrich it with compost generated in your class's composting bin. Even a bag of the best potting soil from your local gardening store will cost only pennies per pot and provide enough soil for several classes and several plant projects.

There are so many plants that can be grown in the classroom that the question becomes which plants to

Curriculum Connections

Science

- Characteristics and needs of plants
- Water-retention characteristics of different soil types
- Growth and change in plants
- Transmission and absorption of light in plants
- Weather: the effect on plant growth (precipitation and the water cycle)
- Diversity of living things
- The rotation of Earth and the effect on daylight
- Interactions of plants in an ecosystem
- Identify living and non-living things
- Structure and function of plant cells
- Organization of cells into tissues
- Structure and function of flowers, roots, stems, and leaves

Social Studies

- Heritage and citizenship
- Traditions and celebrations
- Pioneer life
- Uses of plants in early times (e.g., medicine)
- Plant legends and stories from medieval times and early civilizations
- Global trade in plants and food
- Aboriginal people and their uses of plants

Math

- Systematically measuring, collecting data, analyzing, charting, graphing and using computers
- Estimating
- Predicting results and determining probability
- Problem solving with concrete experiences
- Model building and geometry



- Statistics and the concept of central tendency
- Extrapolating from a line graph to predict future growth of a plant

Language

- Communicating ideas and information for specific purposes
- Producing short pieces of writing
- Using material from other media (charts, graphs, photos, art work) to enhance writing

- Reading a variety of material and express clear responses
- Reading and understanding written instructions and information

Music

- Listening to, identifying and performing music from various cultures and specific celebrations

Visual Arts

- Using, identifying and defining the principles of design in producing a work of art (floral design)

General skills

- Selecting and using appropriate tools to increase the capacity to observe
- Asking questions, making predictions and planning an investigation about plant growth
- Using appropriate vocabulary (bulb, seed, stem, root, propagation)
- Using primary sources
- Mapping skills
- Developing fine motor skills of manipulation
- Acquiring and applying living skills

choose. Like the students in many of our classrooms, indoor plants are diverse. They come in every size, shape, texture, colour, scent and season. Every plant has its own story. It may be native to your area or it may have originated somewhere exotic and immigrated to your locale. Like some of our herbs, it may have arrived with early settlers as a medicinal or kitchen plant, or, like lucky bamboo, it may have come recently. Its story might be simple or complex and can involve settlers struggling in a new land or plant pirates stealing biological treasures from one country to make huge profits in another.

I suggest choosing plants that complement topics you are already covering in your curriculum. Some plants that have cultural significance are suggested below, but your students might suggest others. After all, a great way to engage your students is to ask them to research or discuss with families and friends what plants are important to their cultures. For example, the date palm is significant to Muslims, especially around the holy month of Ramadan. Likewise, the shamrock is important in mid-march around St. Patrick's Day celebrated by the Irish. Lucky bamboo is the plant of choice for celebrating Chinese or Lunar New Year, and marigolds can become a symbol for all celebrations originating in India.

Shamrock for St. Patrick's Day

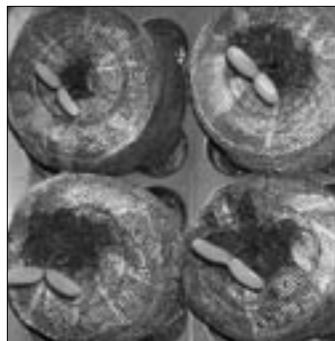
Apparently you don't have to be of Irish descent to celebrate St. Patrick's Day. And, conveniently, one of the easiest and quickest plants to propagate in the classroom is the shamrock, Ireland's national plant. Interestingly, the plant that is sold in North America as shamrock is actually a member of the



Oxalis, or wood sorrel, family and came originally from Mexico. But it doesn't really matter, because nobody knows what the legendary shamrock really was. It may have been a clover. All we know for sure is that shamrock has three leaves, brings good luck to anybody who grows it,

keeps snakes away from the house and sells like crazy early in March, just before the Irish and their friends drink green beer in their favourite pub.

There are many varieties of oxalis sold as shamrock. Most have three leaves but some have four. They come in green or deep red or both. Each new leaf arises from a pink underground stem that is swollen with tooth-like knobs. One of these underground stems may be dug up and broken into pieces. Each one-centimetre section can be planted about one centimetre deep and will sprout its precious first tiny leaf in three or four weeks. Sections that already have a tiny new leaf attached will sprout in a week. One 10-centimetre pot of shamrock will provide enough underground stems for an entire class.



Marigolds for Diwali or Baisakhi

Another significant plant is the marigold, which is the most popular garden flower in India. Any time there is a wedding or other celebration, the bright orange and yellow flowers are there, either

strewn as colourful petals or strung into necklaces.

The easiest way to propagate marigolds is to plant seeds. They germinate quickly, and if your class needs a practical lesson on probability the students can design an experiment to determine what proportion of the seeds will sprout. Some packages of seeds come with this information already stamped on the back, and you can run a short-term germination experiment to determine the accuracy of the prediction on the package or to compare one package to another. Simply plant 100 seeds on a piece of moist paper towel and count the number that germinate in a week — that's the probability of seed germination as a percent. Once your test is done, transfer the germinated seeds into pots and watch as they quickly mature into flowering plants that can be taken home as gifts.

Because they are so important in India, it may be surprising that marigolds are not native to that region. About 400 years ago, Portuguese settlers found marigolds growing in Brazil, where they were already important in the culture of the native people. In typical European fashion, the Portuguese renamed the plant "Mary's Gold" after an important Christian saint, Mary, the mother of Jesus. They exported the plant to the gardens of Portugal and, soon after, introduced the plant to a small Portuguese settlement in India. It quickly became a favourite plant of the Indians, who renamed it "Ganda."



Date palm for Ramadan

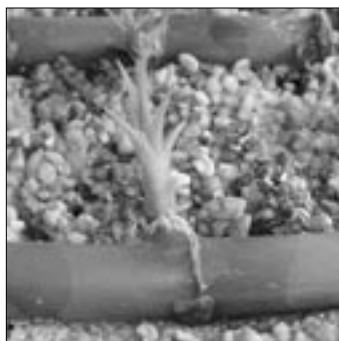
Ramadan is an annual ritual during which adherents to Islam fast every day for a month. To prepare themselves for the daily fast, many Muslims eat a few dates just before sunrise. At sundown, they eat dates

again to break the fast. Dates are the sweet fruits of the date palm, a tree that flourishes in such countries as Afghanistan, Pakistan and Saudi Arabia where Muslims are the dominant cultural group.

What better plant to celebrate Ramadan in your classroom than the date palm? Buy some dates at the grocery store and have all the students in the class eat one to expose the pit. Then simply bury all the pits about two centimetres deep in one well-drained 15-centimetre pot and leave the pot over the summer holidays in a sunny location. In southern

Ontario, where it rains about once a week during summer, I let the natural rainfall water the plant. In drier locations, you may have to water the plant about once a week. If you're lucky, some of the seeds will germinate and be ready to bring into the classroom in the fall. A green shoot and a white root will emerge from the seed, and a small date palm will be ready for Ramadan celebrations. (This year the month of Ramadan begins on September 13. Ramadan begins about 11 days earlier each year because the timing is based on the Muslim lunar calendar, which is 11 days shorter than the 365-day Gregorian calendar.)

A friend of mine from Pakistan always rubs his date pits with a bit of sand before he disposes of them along the path. He believes that by scratching the pit he helps it to germinate. Students can do the same thing in the classroom by lightly scratching their date pits with a piece of sandpaper. I have found that scratched pits and unscratched pits germinate equally well, but you might have your class perform an experiment to investigate this.



Lucky bamboo for Chinese New Year

The best selling indoor plant at my local florist is the lucky bamboo. My florist attributes much of its popularity to the many teenagers who have come to regard it as a "pet plant." They enjoy

the ease of cultivation (just water it, stick it in a corner and leave it) and the attributed power of the plant to bring good fortune to those who keep it. I know one teenager who has memorized the scale of good luck associated with the plant: one stem brings good fortune, three stems bring happiness,

five bring health, seven bring wealth, eight bring prosperity and twenty-one bring general good blessings. Lucky bamboo has become so popular that around the Chinese New Year in February it can be found even in stores that don't normally sell plants, such as drugstores and supermarkets.

Although it takes a long time, you can propagate your own lucky bamboo by cutting a stem into pieces. Each piece must have at least one node in the middle. Lay the pieces horizontally on wet soil in a bright window. As the pieces must remain wet and warm, a flat potting tray with a plastic cover works well as a container. I have had the best luck using perlite, a white volcanic potting medium available at your nursery. Never use water directly from the tap because this plant cannot tolerate chlorine. Instead, fill a jug with tap water and leave it overnight so that the chlorine will gas off. (This is a good idea with many plants.)

In time, you will see a bud emerge from the node and a few stiff roots develop at one end. If your students start this project in September, they will have a small lucky bamboo to take home as a gift to celebrate Lunar New Year in February.

An interesting feature of lucky bamboo that your students will discover when they do their research is that it is not really a bamboo at all. About 50 years ago, a clever florist in Taiwan discovered that if you stripped the leaves from a *Dracaena*, the resulting bare stem resembled bamboo and was much easier to transport around the world. In a clever marketing campaign, the 4,000-year-old tradition of attributing good luck to bamboo was superimposed onto this upstart.

Things you will learn

One of the rewards afforded to teachers who launch into this project is learning about their students and their cultural practices. For example, one of my favourite plants is kalanchoe, commonly called "mother-of-thousands" because baby plantlets develop around the margins of its

Significant Plants

Celebration

Green Corn Festival
 Ramadan
 Halloween
 Remembrance Day
 Diwali
 Hanukkah
 Christmas
 Kwanzaa
 Chinese New Year
 Valentine's Day
 St. Patrick's Day
 Baisakhi
 Passover
 Easter
 Earth Day
 Mother's Day
 Canada Day

Culture

North American Aboriginal
 Muslim
 Pagan, Christian
 North American, European
 Hindi
 Jewish
 Christian
 African American
 Chinese, Korean, Vietnamese
 European
 Irish
 Punjabi, Sikh
 Jewish
 Christian
 Worldwide
 Worldwide
 Canadian

Significant Plants

Popcorn kernels
 Date pits
 Garlic cloves
 Poppy seeds
 Lentils, marigolds
 Potatoes
 Ivy, Christmas cactus
 Black-eyed peas, yams
 Lucky bamboo
 Roses
 Shamrock
 Marigolds
 Horseradish
 Easter lily, pussy willow
 Kalanchoe
 African violet (in Canada/US)
 Maple tree



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mature leaves. Because the plantlets are clones of the parent, they make wonderful material for all kinds of window-sill experiments about light, soil or water. Kalanchoe is about the easiest plant in the world to propagate, and I've kept one going through regular cloning for 40 years. I thought I had read everything there was to read about this plant and knew it all, but after one workshop a participant told me that in her childhood home in Poland, kalanchoe was a very special medicinal plant. She could not find it when she immigrated to Canada, so her father smuggled in a few plantlets when he came to visit. Unfortunately, a faulty heater had destroyed her Polish plants and, sadly, her father had recently died. She had given up all hope of ever seeing the plant again, but at the end of the workshop happily made her way home with a new kalanchoe.

At another workshop, we were dividing a pink heather plant to celebrate the Scottish festival of Robbie Burns' Day. A participant from Ireland told me that her family tradition was to search the moors for white heather. She recalled being told as a child that a sprig of this magic plant has much greater power than the more common four-leaved clover.

Engaging your students

As a botanist, I regret that most students do not share my fascination with plants. But students can often be hooked by stories and cultural connections. Fortunately, in these days of integrated curriculum, plants grown on the windowsill can engage students in multidisciplinary ways that were unthinkable when I studied botany in school. So why not try it? Find out what plants are significant to your students. Have them share these cultural stories with the class. Then transform that sunny windowsill at the back of the classroom into a mini-greenhouse.

Propagation can be slow. Start with a plant such as jade plant, Christmas cactus or kalanchoe that gives immediate results. If you propagate them on Friday, you want your students rushing in on the following Monday to see how their plant has done. Once you have established enough interest in growing plants, branch out to those that take longer.

In order to cope with ever increasing curricular demands, teachers need to find ways to integrate two or more learning expectations into one activity so that everything a student does counts more than once. At the same time there is an overarching expectation that teachers should be developing programs that develop esteem for the customs, cultures and beliefs of a wide variety of societal groups. Growing culturally significant plants in your classroom just might be the answer. While your students are busy learning all the math, art, language, geography and history related to plant biology, they can also be sharing and valuing each other's cultural traditions. That way, they will be learning that every plant has a story and every student has a place.

Allan Foster recently retired as director of the Kortright Centre for Conservation near Kleinburg, Ontario. He is currently a visiting scholar at a small graduate college in Hong Kong where he teaches adult education strategies to teachers and preachers from 19 countries in Asia.

Note

1. The Potmaker is a smart, environmentally friendly tool for turning newspaper into biodegradable plant pots. It is available for less than \$20, in Canada from Richters Herb Specialists at <www.richters.com>, in the U.S. from the National Gardening Association's on-line Garden Shop at <<http://nga-gardenshop.stores.yahoo.net/14-1104.html>>.

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