Racing on Olympic Trails
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Interactions Then and Now
CD collection of back issues of OSEE’s journal
Editor’s Notes

Mike Morris

I would never have thought of Bill Thompson, Interactions’ esteemed Editor as a Christmas kind of guy. But here he was, e-mailing me this issue on Christmas Day to proof. He wasn’t taking any excuses from me. All of this work and both a new year and new decade are on the horizon.

What do we have for you in this issue? To start off with, how about the great cover photo of a winter scene complete with cross-country skiers? How many of you know that Bill Thompson’s two older kids are very accomplished Nordic skiers?

What have we got in this issue? We have an article by Holly Groome on some research she conducted on Eco Literacy in Every High School Classroom.

We also have a wide variety of articles that have been sent to us by teacher candidates at UT-OISE. A number of them are looking at the ecology of oil spills and water. Thanks to all of these industrious future teachers for sending along their projects to us. OSEE and Interactions have a good relationship with the staff and students at OISE. Bill Thompson has also included a short piece extolling the wide variety of uses for honey and cinnamon. This issue is also reprinting a very inspiring graduation speech given by Paul Hawken.

Allan Foster sent us an unusual nature story about crickets. Andrew Boughen’s FYI column continues to be chock full of information. In Meanders, I’ve invoked the names of two fictional characters who are very familiar to many of you.

What do you think of this issue of Interactions? I’m looking for submissions to the next couple of issues. Do you have something you’d like to see in print? Send me something that works well in your classroom. Contact me via e-mail. I’ll answer soon. How about looking at our new web site to see what’s new: www.osee.ca.

There’s not much snow yet in the Forest City as I write this, but I’m confident that my car will be ploughed in very soon. Have a great holiday season!

Mike Morris is Editorial Chair of Interactions
It has been a busy couple of months since the last issue of Interactions. Bill Thompson and I attended the OAGEE (Ontario Association of Geographic and Environmental Educators) conference at Trent university on behalf of OSEE. The list of speakers at the conference was impressive and included sessions that emphasized the environment. I had many conversations with teachers about classroom teaching and integrating environment into the curriculum. Our free Interactions issue was accepted with enthusiasm, especially after we pointed out the several high quality and complete lesson plans included. A buzz is building about our April conference and many potential presenters were contacted.

On a personal note, my job description at Camp Kawartha has changed. I can proudly announce the opening of the Camp Kawartha Environmental Education Centre. This centre is located at Trent University on its expansive nature preserve. It is now my job to oversee the education of primary and secondary students at this new day centre.

Most exciting about this event is the building itself. Built by the Sir Sandford Fleming College’s Sustainable Building Design and Construction class this summer, the building is a showcase for low impact and high efficiency design. It is being touted as “one of the most sustainable buildings in Canada”.

At the centre we are not connected to the municipal water system. Our drinking water will be provided by rain running off the galvanized steel roof and stored in an underground cistern. We have a two stage indoor water treatment system. The water is heated by a solar hot water panel. Our toilets are composting versions. These toilets have a cover that opens when someone sits on the seat. Needless to say we are anticipating some “splash back” until the little boys get used to the system. Despite this small drawback I am very happy that our waste is managed in-house and never mixes with the potable water system. Our grey water is treated by passing through an indoor wetland where good bacteria in the soil and plant roots cleans the water before it is released into the ground.

The centre is designed to be power neutral. We are connected to the grid with a two-way meter. When the sun is shining, our Photo Voltaic array will produce far more energy than we need and the excess is sold into the grid. This system allows us to use the clean renewable energy provided by solar electricity without the need to use expensive batteries that contain toxins and have a limited lifespan. I look forward to watching data on the energy we produce displayed on a computer soon to be installed.

The building is heated by a ground source heat pump. Using very little electricity the entire building is kept warm. Helping this system out are large south facing windows that provide passive solar heating. The walls are made of locally sourced straw and hemp stems then covered with natural clay based plasters. The concrete in the building floors contains slag which is a waste product of the steel industry. This allows the concrete to contain less cement and save the greenhouse gases that would have been released in its production.

I feel very lucky to be able to work in this building. I hope that our members will be inspired by this and other sustainably designed and built structures. We can’t all live or work in a building that is this novel, but we can all make choices in our homes to live more sustainably. More information about this building is available at www.campkawartha.ca.
Making Change

Astrid Steele

There is some brain research out there that indicates the older we get, the less the physiological components of our brains want to deal with changes in how we do things or think about things. Our neural networks have established smooth chemical pathways that seem to work. Sound familiar? I know that my brain prefers 80's and 90's rock to techno and rap and I don't understand fashion statements like excessive cleavage in professional attire or jeans worn below the butt. Of course it doesn’t end with music or fashion. We build around ourselves a comfort zone of values and lifestyle in which we expect to live out our adult lives.

That same subconscious intention is enacted in our teaching career. We find or create ways in which to manage our classroom, teach lessons, or handle difficult situations, that eventually become habit; they become less work intellectually and emotionally and we stick to those practices. Then we acknowledge and support our positions with slogans like: the more things change, the more they stay the same, implying that there is no point in change. Don’t fix it if it ain’t broke.

Indeed sometimes change seems silly or unnecessary. Sometimes change is foisted on our consumer-driven society to give people new reasons to shop... new fashions, new homestyles, new offerings from the fast-food chains (boneless chicken wings?) The older we become, the more we seem to be surrounded by reasons to scoff at change. But beware the slippery slope of over-confident scorn at new-fangled ideas. Sometimes change is more than a diversion, sometimes it is necessary for our common survival.

Education is one arena where the only constant seems to be change and teachers are known, as a group, to be not only reluctant to embrace change, but downright resistant to it. However, that position is neither professional nor sensible. Rather, working in a profession that is inundated with demands for change, we should be honing our ability to judge when the newest trend in education is one that should demand our attention. There are certainly times when education research and intuitive teacher knowledge combine to develop important new ways to think about classroom practice. For example, Howard Gardner’s multiple intelligence theory, informing teachers working to meet individual student needs, gave us Differentiated Instruction. In my opinion it is a tremendous benefit to students (albeit more work for teachers).

Now, as well as having brains that dislike change, most of us work in a ‘teacher culture’ that is, by and large, a static entity. Teacher enculturation is equivalent to putting on intellectual blinders (a pair of small leather screens attached to a horse’s bridle to prevent it seeing sideways and behind) that do not allow us to consider different perspectives and ideas as legitimate alternatives. Of course one of the obvious problems with a static teacher culture is that it is entirely unadaptable to a dynamic society, which is exactly what we live in. Thus, we, as teachers, are perplexed by an apparent ineffectiveness in our teaching methods evidenced by unmotivated, disinterested, apathetic, unsuccessful students. (And perhaps evidenced as well by a personal niggling sense of boredom and dissatisfaction in the work that we do.)

So how does this connect to environmental education? Why write about teacher culture and change in this journal? There are a number of reasons and among them is that environmental education itself has seen tremendous changes in what is meant by it, and how it is presented. It is my intention to write about the many forms of environmental education and their implications for teachers, in upcoming columns. But before I embark on that writing, it seems important to set the stage for the lessons that environmental education has for us as educators. For now, I think that the Environment itself has some lessons for those of us constrained by the limitations of our teacher culture, rendering our efforts too often ineffectual in the face of a changing society.

The natural environment is premised on adaptability. Organisms without the ability to adapt to changes in environment must migrate or perish. On the other hand, organisms able to modify their behaviours, indeed their physiology and morphology, are able to adjust and flourish. Time to take our lesson, once again, from nature. Change is necessary for life. Change should be understood as a necessary part of our work as teachers as well. Change is not to be avoided, refused or dismissed. Change is to be carefully considered, with an open mind. Teacher culture needs to take a page from nature and become a culture of thoughtful adaptive change.

Now we might be ready to really consider the promise of environmental education.

Astrid Steele is Assistant Professor of Education, Curriculum Studies – Science, Nipissing University
New Book has Arrived!
Alan Foster, OSEE Nature Columnist and former Director of the Kortright Centre, at our last conference was telling us about the impending publication of his book of nature stories. Alan has selected 29 stories highlighting the natural history of plants and animals we see around us in the Great Lakes region, and published them in *The Loon, the Bat and the Raspberry Bush: Fables from the Natural World*. The book includes beautiful sketches by Leslie Foster, and is available from Amazon.ca. You must also visit the book’s website at http://webme.com/naturestoryteller, and view the videos of Alan and his son making the loon calls, owl hoots and other sound effects associated with the stories. Great fun!

Contests for Students
Earth Day Canada is running a video contest for filmmakers young and old. They are inviting submissions of silent videos, 90-seconds in length highlighting the work of individuals or groups in Canada that are working to reduce their impact on the environment. The competition entitled “Everyday Heroes”, is open until March 1, 2010. Winners will be awarded prizes and finalists will have their films seen in shopping malls across Canada, on monitors found in the TTC subway, on YouTube, and on the Earth Day Canada website. Details of the competition, and submission guidelines can be found at www.earthday.ca/film.

Interactive Student Learning
Each month there seems to be a number of new interactive web sites available that would be interesting for students to visit and gain environmental knowledge. The website http://actonco2.direct.gov.uk is a United Kingdom website which is an initiative involving several government agencies. It has a variety of interesting information, and a subwebsite that the UK Department of Energy and Climate Change has just launched. This is an interactive website based map which highlights the impacts of an average 4 degree rise in global temperature above the pre-industrial climate average. When scrolling over the map, one can zoom in to areas that will see the greatest impacts of drought, sea level rise, melting of permafrost. There is short scientific background essays embedded in the map.

If you have students who are enjoy interactive game based learning, Starbucks may have the answer. In collaboration with Global Green USA, Starbucks has launched the *Planet Green Game*. The players in this game gets to chose their characters and travels about their virtual community learning about ways to reduce environmental impact. Visits to the local building materials store, service station, and carefully examining household appliances are but a few ways that, as a player in this game, you learn about everyday decisions that can improve our environment. Play the game at www.planetgreengame.com.

The Canadian “Environmental Ideas and Action” magazine, *Alternatives Journal* has launched a podcast that can be accessed from their website at http://alternativesjournal.ca/podcasts. There are a variety of topics posted, and they are linked with various editions of the magazine. A subscription to the magazine would make a good gift, and it is available in a environmentally friendly paperless electronic version at a reduced rate.

The *Story of Cap and Trade*, a new film from Annie Leonard, the creator and narrator of *The Story of Stuff*, can now be viewed online. In a fast-paced way, It examines one of the key solutions being examined at Copenhagen, and highlights some of the problems behind this concept. Visiting the website www.storyofstuff.com/capandtrade/, you can both view the film, and also link to a variety of other sites and projects focussed on the issue of Climate Change.

Andrew Boughen
Ontario Government News
It will be interesting to hear the results of an online survey that was conducted by the Working Group on the Elementary Curriculum during the month of October. The Ministry of Education wanted to gather perspectives and insights on Ontario’s curriculum for Grades 1 to 8, and thoughts about learning and teaching in Ontario’s elementary schools. In particular the working group was to examine the “over-crowdedness” of the curriculum. Important to environmental educators, and those who see environmental education as an important part of the curriculum, the survey allowed respondents to comment on what should be priority themes of education and included environmental education in a list of priority themes. Hopefully many teachers, students, parents, and stakeholders took this opportunity to express importance of maintaining and strengthening environmental education in public education curriculum, and strongly state to the Ministry of Education that environmental education should not be crowded out.

An interesting source of information regarding environmental issues and policy in Ontario is the website of the Environmental Commissioner of Ontario (ECO). The ECO is Ontario’s independent environmental watchdog, appointed by the Legislative Assembly. The provincial government’s compliance with the Environmental Bill of Rights is monitored and reported on by this office. The current commissioner, Gord Miller, who has spoken before OSEE’s annual conference and will be opening our conference in April, has recently released the Environmental Commissioner’s 2008/2009 annual report entitled Building Resilience. It is available online at the website www.eco.on.ca/eng/, and highlights current key environmental issues in the province, the province’s response to these issues, and recommendations to address the protection of Ontario’s environment. In particular this year’s report contains an interesting section on Biodiversity.

Reducing our Carbon Footprint on the Water
A new solar boat was launched this summer by the Toronto and Region Conservation Authority (TRCA) at Lake St. George, a residential outdoor and environmental education centre in the north part of Richmond Hill. For many years students at the Field Centre have participated in an aquatic ecology program on board a pontoon boat powered by an outboard gasoline motor. TRCA worked with Tamarack Electric Boats to design and build an approximately 10m long pontoon boat powered by electric motors. These motors draw power from batteries that are charged by solar panels located on the canopy of the boat. The students now enjoy an impressive demonstration of green energy, while at the same time studying the sensitive kettle lakes of the Oak Ridges Moraine. In early October, the TRCA held an official launch ceremony at Lake St. George Field Centre attended by The Honourable Kathleen Wynne, Ontario’s Minister of Education. The new boat was named in the Minister’s honour, recognizing her efforts in supporting Environmental Education in Ontario. Some photos of the event are posted on the Education Ministry’s website at www.edu.gov.on.ca/eng/gallery/. TRCA has many opportunities for high quality environmental education experiences in the GTA, and the website www.trca.on.ca is a place to start planning your students’ field trips.

Upcoming Conferences and PD Opportunities
Royal Botanical Gardens is presenting a symposium entitled Living Plants, Liveable Communities: Exploring Sustainable Horticulture for the 21st Century, February 16-19, 2010 in Burlington. The symposium is being advertised as suitable for all practitioners of horticulture, and will look at topics such as invasive species, pest management, ensuring biodiversity is supported in urban landscape and many others. The Tuesday sessions in particular will highlight hands-on workshops in plant identification, seed saving, and cooking with local produce. You can register for the symposium now at the RBG site http://rbg.ca/cisb/2010symp/.

Further afield, the Canadian Wildlife Federation is offering several professional development programs for educators this coming spring and summer. The Federation is running a National Biodiversity Education Field Workshop in Saskatchewan from May 10-14, 2010. You can view an exciting itinerary at www.cwf-fd.org/en/education/updates-network/conferences/cypress-hills/. There will be opportunities to visit and learn in a number of locations in southwest Saskatchewan, including some time in the beautiful Cypress Hills area. Guest speakers include First Nations elders, and researchers from various universities.
In addition, the CWF Learning Institute will take place on the St. Lawrence River from August 4-14, in the area of the Saguenay – St. Lawrence Marine Park. It will be a unique opportunity to study the biodiversity of the area including the whales that congregate here to feed and raise their young. The program will be hosted by Dr. Yves Jean, a Founding Fellow of the CWF Learning Institute and Director of the Science and Technology department for the University of Quebec in Montreal (TELUQ). Qualified educators may also enroll in this Summer Institute to earn a university credit. The Federation is finalizing plans, but registration is open now at www.cwf.fcf.org/en/educate/programs/learning-institute/summer-course/2010/.

As mentioned in last issue’s FYI, the North American Association for Environmental Education (NAAEE) is holding its 2010 conference at the Buffalo Niagara Convention Centre. The New York State Outdoor Environmental Educators Association will be hosting the event from September 28 - October 2, 2010, and NAAEE is now calling for presentations. The themes and stipulations for the submissions can be found at the website www.naaee.org/conference/call-for-presentations/. This will be a good opportunity for teachers from Ontario to join attendees from around the world at this annual conference.

Biodiversity Gets the Spotlight
The UN has proclaimed 2010 to be The International Year of Biodiversity. There will be celebrations and resources produced around the world aimed at showing how important biodiversity is in our everyday lives, how biodiversity around the world is being lost, and of course what we can do to combat biodiversity loss. Currently when you visit the home website at www.cbd.int/2010 you can view general information about the UN event, and find some excellent resource material (primarily UK based). I hope to be able to highlight Canadian links to this UN initiative in upcoming Interactions issues.

An interesting project was in the news this fall that involved high school students from across Canada collecting samples of fish that were being sold in markets, restaurants, and stores. Samples were sent to the Biodiversity Institute of Ontario, University of Guelph for genetic testing and identification. As was found in smaller studies, it was found that about one quarter of the samples were mislabeled at the point of sale. The investigation was conducted in conjunction with Bioscience Education Canada, with help from the Ontario Genomics Institute, and was highlighted at a recent Barcode of Life Conference by University of Guelph Assistant Professor Robert Hanner. An interesting article in the Toronto Star can be found at www.thestar.com/investigation/article/723956. It highlights a variety of reasons why consumers should be concerned about these findings. For environmentalists, one of the key concerns is the fact that some of the mislabeled fish were identified to be endangered species. While consumers may be trying to be conscientious in purchasing, they may unknowingly be purchasing endangered species. In this era of overfishing, the barcoding project may be another weapon to assist in the effective monitoring of fish harvests around the world. Further information regarding the Barcoding of Life initiative can be found at the very interesting website www.barcodinglife.org/.

Cell Phones and Gorillas
Watch for a place to recycle your cell phone, and encourage others to do so too. The Toronto Zoo has teamed with other zoos, and wildlife organizations to collect cell phones that are sent to a company called Eco-cell. This company either reuses the phones or recycles the components and gives money to the Toronto Zoo for each phone. The Zoo in turn uses the funds for conservation projects directly related to lowland gorilla conservation in Africa. There is a link between cell phones and the further demise of endangered lowland gorillas in the Congo, in that one of the key components of mobile phones is made from an ore (coltan) mined in the former republic of the Congo. The ore is most easily found in the rainforests that the gorillas also inhabit, and by recycling our phones there is of course less, demand for newly mined ore, and less habitat loss in the gorilla’s home. Look for drop off boxes in the GTA at the Zoo, and Toronto and Region Conservation Authority sites such as the Kortright Centre, Black Creek Pioneer Village. There is also a mail in address that can be found with other information about the program at the website www.torontozoo.com/Conservation/ecocell.asp.

Andrew Boughen is an environmental educator living in Newmarket, Ontario
Keeping the videos that are shown in your class up to date is sometimes a challenge. Finding time to attend documentary film festivals, watch educational shows or preview videos from your Boards media services can be a challenge. This column has a "home and garden" theme to help update your classroom video collection. Here are two newer videos, one traditional and one alternative, to show in environmental science or geography classes examining buildings, water and energy use.

1. Gimme Green
This multi-award winning 30 minute documentary explores America’s largest irrigated crop – grass. The pros and cons of this $40 billion a year industry are clearly delineated. The documentary works so well because it humorously juxtaposes the social pressure for a beautiful green lawn with the well researched negative health and environmental effects. This video presents a variety of viewpoints and leads to lively class discussions. If your students have to mow the lawn at home they will relate to this video.

Everyday people involved in the lawn industry discuss the value of a “well kept green lawn”. A real estate agent illustrates the importance of lawns to the resale value of a house. A lawn care company employee dismisses customers concerns about pesticide chemicals infiltrating ground water while fact screens present the negative environmental consequences of applying pesticides, herbicides and fertilizers. Watching the city bylaw officer leave warnings at the houses where lawns are “unkempt” reminds me of the battles won in Ontario municipalities for the right to naturalize lawns and gardens.

Some solutions to this waste of resources showed people taking out sod and replacing it with artificial turf, xeriscaping to focus on drought tolerant plants and naturalized lawn tour are given by the homeowners who explain the multiple advantages over traditional lawns. In all of the scenes ordinary people speak for themselves. The last ten minutes focus on the water for irrigation with some stark shots of massively dropping water levels. The threats to groundwater from chemical contamination are clearly outlined.

This documentary avoids “talking heads experts” sitting in a chair far away from the problem. There are a few limitations, including the fact that is decidedly American, with a focus on the dryer southern states. If you have many ESL students they might find the captions in the online streaming video useful. This video can be streamed at www.gimmegreen.com/updates/seeGG.htm

2. Build Green
This is the fourth of a five part sustainability documentary series done in the summer of 2007 for the Nature of Things with David Suzuki. Your students can tour Canadian homes constructed with new technologies. Randy Bachman, of the Guess Who and BTO fame, tours us through his house made of rammed earth. The building is a work of art and technology. The rammed earth walls are so solid that a hose sprayed on the hard packed soil doesn’t cause any soil to wash off.

The details of building a straw bale house are shown and some of the myths about its flammability are corrected. As well as construction materials, the show covers how to “green” the operations of the house. A variety of energy generating techniques are shown including wind turbines and photovoltaic’s, with excess electricity sold to the grid or stored in batteries. Houses with passive solar water heating and alternative ways to handle sewage allow students to understand that society has technologies to solve many major environmental problems and we need the will to do so.

For students this video is a positive experience. The variety of solutions available to improve the ways we build and service houses surprises many of my students. This is a good investment of 45 minutes of your class time. However, if your class watched Gimme Green first, they would be justified in asking why many of these “Green Buildings” still have large lawns!

The video can be ordered from cbclearning.ca/cbceds/shopping/home.aspx and costs $132 for an educational license. The DVD is not available through the regular online CBC shop but personal copies can be ordered for $27.99 by contacting toll-free at 1-866-999-3072, or cbc_education@cbc.ca
We all know that some insects such as honeybees and ants are called social insects because they live in huge colonies. The surprise is that this was once true of crickets as well. Crickets lived in the biggest colonies of all. In the beginning, a big cricket colony could easily dwarf a hive of bees or a hornet’s nest.

Once upon a time there was a big cricket colony that filled much of a hollow tree. At that time, crickets were quiet and shy and peacefully shared their space with other quiet creatures such as cockroaches, ladybugs and centipedes.

One day a curious cricket was wondering about why he had wings. He couldn’t fly, so it appeared that his wings were useless. He began to wonder how else a wing could be used. He experimented with his wings by moving them back and forth and suddenly, to his great delight, he discovered that if he scraped the edge of one wing against the base of the other, he could make a very pleasant chirping sound. He tried a variety of combinations – moving quickly, slowly, even to the point of banging the wings together, but he liked the squeaking, chirping sound best.

A couple of his friends squeezed in close so they could learn how to make that kind of noise. After a little instruction, they too could make music with their wings. More and more of his friends joined in until they had enough members to start a little rock band. They worked very hard and it wasn’t long before they gave their first concert. They named their group, “Black Wing and the Crickets” and they were a huge success.

More and more of their friends wanted to join in the fun so soon there were 1000 crickets in the band. There were so many of them that they had to stand in a very big circle and face in so they could keep time with their wings. That old hollow log began to rock and vibrate with the sound. But the effect was very pleasant. Even the cockroaches, ladybugs and centipedes liked it.

Everything would have been fine if it had stopped there - but the band grew to 2000, 3000, 5000 and even more. The bigger the band became the more fun the crickets had. They started playing all night – from dusk until sunup. When they got too tired to chirp with their wings, they started to dance and stomp on the walls of the hollow tree.

Eventually, with all the crickets in the hollow tree scraping their wings and stomping to the music, it became impossible for anyone to think. What’s more, pieces of the hollow tree started to shake loose with the racket.

After one or two nights of these all-night parties, the other residents started to complain. They were losing so much sleep that they were getting grumpy. They eventually started a petition to get the crickets evicted.

And that’s what happened. If the crickets had been paying attention, they could have fought the petition and argued against it, but they were having too much fun to notice all the other insects collecting signatures. So the landlord had no choice but to kick the crickets out of their home.

The crickets were having so much fun making loud music that they couldn’t have cared less. When they received the eviction notice, they marched right out of that hollow tree and spread over the entire meadow. They actually enjoyed living outside. They could still chirp to each other but it wasn’t so crowded. The best part was that they could sing all night without bothering anybody.

And that’s how crickets developed into solitary insects. They’re still social in the sense that they sing and chirp to each other all night. They love to scrape their wings and blend their rhythm with the other crickets nearby. But they no longer all live together in the same house. And that’s just fine with the cockroaches, centipedes and ladybugs who all report that they are sleeping better now.

A group of keen environmental educators created the above story this past September at a story workshop – part of a conference held at Mono Cliffs. For more information about the activity used to create the story, check out Allan’s web site at: http://web.me.com/naturestoryteller

Allan Foster is a long time educator at the Kortright Centre for Conservation. To read more of Allan’s nature stories, visit his website at www.kortright.org and click on AllanFoster’s Stories.
Exploring the World of Weather

A lesson plan demonstrating the importance of people who study, analyze and forecast weather conditions today and potential climate change in the future.

Ask students to identify:
- Five sporting activities they enjoy
- Five types of food they love to eat
- Five local businesses they visit
- Five non food products that they use in their day-to-day lives

This lesson will enable students to:
- Summarize the ways in which changes in our weather and climate can affect their day-to-day lives, today and in the future
- Predict possible future changes resulting from climatic change
- Compare the potential career of climate scientists/meteorologists with other career options available

Record these on the board. Now divide the class into four groups and assign each group one of the lists. Assign the following task; ‘Identify five ways in which each item can be affected by the weather today or by changes in our climate over the next 25 years.’ Allow time for discussion and the development of the lists. Provide each group with one minute for a quick presentation of their ‘five ways’.

Summarize by emphasizing how important the weather and climate changes are to our economy, businesses, jobs, incomes, and lifestyles, etc. Relate this to the importance of the people who help forecast and report on weather conditions and who analyze and predict changes in our climate. Discuss with students the ways in which they think their lives may be different in the future as a result of changes in the climate. Compare how they think it may be better or worse. Ask them to explain the basis on which they made these forecasts. Emphasize the importance of knowledge and research in enabling us to improve our forecasts and possibly change the future. Highlight the importance of, and the kind of work that is done by, people in the area of weather analysis and predicting climate change.

Distribute the write-up on the climate change specialist/meteorologist (www.eco.ca/profiles) and summarize the attributes of this career. Encourage students to think about and discuss other environmental professions that relate to weather and climate conditions (e.g. areas related to forest fires, habitat loss or biology, etc.). Another class discussion could focus on the effects of severe weather (e.g. storms, floods, tornadoes, etc.) and the importance of improving our ability to predict and contend with such weather.

As a fun conclusion, ask students to identify all the movies they can think of in which the weather, weather events, climatic changes or people who work in the area of weather and climate analysis have played key roles. Discuss the impact that weather/climate had in the movie and what lessons, if any, can be learned about the importance of studying and forecasting weather and climate change. Conclude with a review of the level of education, type of courses, etc. that a career in this area would require.

This lesson will fit when there is a need to teach about:
- Factors affecting individual, society, business, and political decision making
- Change in our society and factors that will affect the future
- Evolving entrepreneurial opportunities
- The application of science and technology to create a better future
- The importance of weather and climatic change in our lives
- The importance of knowledge and research to forecasting future outcomes

ECO Canada, the Environmental Sector Council of Canada, was created to ensure that there is an adequate supply of people with the demonstrated skills and knowledge required to meet the environmental human resource needs of the public and private sectors. ECO Canada is continually working to develop a variety of fun, interactive, and educational environmental career awareness tools for students and educators to use both inside and outside of the classroom.

For additional activities on ‘exploring the world of weather’ and other environmental topics logon to the ECO Canada website at www.eco.ca/Interactions.
Eco Literacy in Every High School Classroom

Action Research

Holly Groome

Introduction

Question
How can I incorporate the Eco initiatives into my teaching practice to change the level of Eco Literacy in my grade 10 science students?

Rationale
The Minister of Education, Ms. Kathleen Wynne, has recently announced and published a document called Acting Today, Shaping Tomorrow. The document states:

Ontario’s education system will prepare students with the knowledge, skills, perspectives, and practices they need to be environmentally responsible citizens. Students will understand our fundamental connections to each other and to the world around us through our relationship to food, water, energy, air and land, and our interactions with all living things. The education system will provide opportunities within the classroom and the community for students to engage in actions that deepen this understanding.

Shaping our Schools, Shaping Our Future p.4

This document is intended to increase the amount we teach about the environment and how much we teach in our environment. An Eco Literate student is one who has the ability to be a systems thinker, who can mentally manipulate the complex parts and recognize them as integral to the success of the whole. I believe this is the kind of student towards which we are hoping to guide and shape those in our classrooms.

I live in one of the most beautiful parts of our province, with Algonquin Park in our backyard. Yet I am constantly saddened by the number of my high school students who are not able to identify even one plant, one bird, or one animal they see. Even more frightening is the reality that these same students never spend any time in the out-of-doors.

It has been scientifically proven that nature plays a significant role in developing the psyche of children. Being in nature is connected directly to their ability to be critical thinkers, to their health and well being, and to their successes later in life. With a deeper understanding of Eco Literacy, perceptions in our students will shift. This shift in thinking will change the way we live our lives and move us towards a world that is more sustainable; one in which we can pass on to our children’s children.

Materials
- Board Eco Schools initiatives documents
- Provincial Eco Schools initiative documents
- Ministry Environmental Education documents
- Access to outdoor classroom
- Field guides to local flora and fauna, field equipment (binoculars, magnifiers, dip nets)
- Grade 10 science students
- Grade 10 science curriculum documents
Definition

Eco Literacy or Environmental Literacy is defined as; the ability of a person to act sustainably on a daily basis with a broad understanding, the ability to explain, and an appreciation of, how people relate to the complex natural systems in which they live.

This requires substantial awareness, knowledge, skills, and attitudes in order to incorporate environmental considerations into daily decisions. A truly environmental literate person will consider the environmental implications of all decisions including those surrounding consumption, lifestyle, career choice, civic responsibility; and will see themselves as part of a collective action to help protect our planet.

Methodology

The inquiry was conducted using a three part process. Several interviews were conducted with teachers in the high school classroom setting (traditionally and non-traditionally), at a variety of levels, all who have a varying degree of expertise in the field of environmental education. A literature review was also conducted on the subject of environmental literacy and a classroom action plan developed to be carried out in September, 2009. The following breaks down the methodology in more detail.

• Colleague’s Interviews
• Literature Review
• Action Plan for Implementing in the Classroom

Colleague’s Interviews

Ten teachers were asked a series of seventeen questions. The teachers were from a variety of backgrounds and expertise. Respondents came from schools as small as 150 students in Mattawa, Ontario, to as large as 2200 in Caledon, Ontario. They teach in both public and private venues, are all qualified by OCT, and many have backgrounds in areas other than science. Respondents teach in Trillium Lakelands, Peel, Durham, and Near North school boards.

The following is a summary of comments and reflections.

• Of the respondents, 82% stated they “speak” about the environment in their classroom, while 76% stated they “teach” about the environment.
• Strikingly, 92% stated they do introduce environmental education in courses without an evident environmental theme.
• Only 2 of the 10 respondents are involved in the Ontario EcoSchools program and both mentioned this was due to a Board-wide imposed initiative.
• All of the schools had some kind of a recycling program, although many of them reflected on the lack of student involvement and the obstacles of effective implementation.
• Only 3 schools had a composting program and the students were not highly involved in the implementation of the program.
• All respondents agreed that students demonstrate little to no environmental knowledge and present an attitude of carelessness based on their actions in their respective schools.
• One respondent relayed a story of students throwing out clothing at the end of the school year because “we just don’t want to carry it all home!”.

According to the teachers interviewed, the following themes were identified in their definitions of environmental literacy. Students who are eco literate will

• Have the ability to weigh the effects of their personal actions (and make changes) on the health of the planet
• Have an understanding of the basic components of our environment and their interactions
• Have an understanding of the social and economic influences, positively and negatively, on our Earth
• Have the skills and knowledge base of scientific concepts related to the environment to allow informed decisions

When teachers were asked to share their opinion regarding question #15 (Do you think teaching about the environment will make our students more environmentally literate? Why or Why not?) a diverse set of answers was collected. A few are quoted here:

• “No and Yes. Students must be allowed and encouraged to ‘be’ in nature, ‘play’ in nature and ‘explore’ nature before they can really become eco-literate.”
• “Not if it is being preached…oil is bad…world is dying around us. Literacy period is what should be taught. Critical Literacy, Scientific Literacy, Environmental Literacy, etc.”
• “At least a little, depending on how it is taught. Hands on activities, like tallying water usage in their home have more of a real life impact.”

Many felt that changing behaviour was the only true measure of how eco literate an individual is. Here are a few responses from question #16 (Do
you think teaching environmental literacy in our school will change the behaviours of our students? Why or why not?)

- “Yes. When students realize that they can make a difference they will. If they think it is too far gone they throw their hands up!”
- “Only if we can ‘teach’ what was said above (‘be’, ‘play’, ‘explore’). We have to learn how to teach ‘will’ or ‘motivation’ to change before we will actually see permanent change. “
- Overall, teachers surveyed felt their student score below 2.5 for eco literacy, on a scale of 0 to 5 (0 = none, 5 = most).

Teaching Environmental Education: Why it is so important and why it is not more pervasive.

Teaching our children to connect to nature is in our collective self-interest. It is now suggested by many scientists that just as children need exercise, a healthy diet, and adequate sleep, they need contact to nature. A healthy connection to nature improves both a child’s physical and mental state of being. (Louv, 2009)

Teaching our children Environmental education places an strong emphasizes on the skills we deem most valuable as educators; cooperative learning, critical thinking and discussion, hands-on activities, and real-world application (Classroom Earth, 2009). The benefits of such learning are ten-fold and can give our students the ability to; work productively in a team setting, listen to and appreciate diverse opinions, promote change for the greater good, connect with members of their larger community on a very meaningful way, solve real-life problems and become advocates and activists to help protect what they hold sacred, nature. (Classroom Earth, 2009, EETAP, 2009)

Students, who fail to be successful in a traditional school setting, often thrive when they are given the opportunity to learn in a natural outdoor classroom. And the payoff is huge, with better academic achievement, better social interactions and

Literature Review

“The need to understand environmental issues as they relate to everyday life becomes more important – and more urgent – each day.” (Classroom Earth, 2009) And yet much of the global indicates that in general, we know startlingly little about the environment and even less about our personal connection to nature and the world around us. Without knowledge and understanding, action and behavioural change seems fruitless and rather overwhelming. In order to make the changes necessary to save our species and our way of life on Earth, we must incorporate environmental learning into our life; at home, at work and in our greater community. (O’Neill, 1996)

Reference: http://tpr.alberta.ca/parks/kananaskis/images/ed_literacy_graph.gif
better civic responsibility. (Classroom Earth, 2009, Louv, 2009) The research now shows that we must get our kids back into nature, the survival of our species may depend on it.

We don’t often think of the province of Alberta as a “green” place but, the Government of Alberta is steps ahead in the understanding of the importance of teaching environmental literacy to youth. Here is a graphic organizer found on the tourism, parks and recreation site for Kananaskis Country. It clearly illustrates the value in an eco literate person and the exceptional abilities they will have. (Government of Alberta, 2009)

It is inarguable, the lasting impact that environmental education can have on children. So why is environmental education not more pervasive if all the research tells us it is so important?

Many of the resources consulted in this study discuss the lack of teaching environmental education in a classroom as a result of lack of confidence in the teachers’ ability to effectively impart the content. Not everyone is a trained environmental scientist or an active member of Greenpeace, and not everyone feels comfortable with the demands on the teacher required to effectively teach environmental education.

**Loss of Connection to Nature**

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. www.brainyquote.com/quotes/quotes/a/ aldoe104964.html“Aldo Leopold

Much of the research indicates that our society has radically moved away from nature. Westernized culture has begun to see it as something we are separate from and therefore have little connection to. This causes a dichotomy between nature and the rest of the world that children have a hard time overcoming.

“Respect for nature. Prudence must be shown in the management of all living species and natural resources, in accordance with the precepts of sustainable development. Only in this way can the immeasurable riches provided to us by nature be preserved and passed on to our descendants. The current unsustainable patterns of production and consumption must be changed in the interest of our future welfare and that of our descendants.”

United Nations Millennium Declaration, 8th plenary meeting, September 8th, 2000

Nature inspires children to be creative and explore. Richard Louv suggests that “it serves as a blank slate upon which a child draws” (p. 7). When given the freedom to explore nature, children find solace, fantasy, inspiration, and peace; all of which are so important in the growth of a balanced character-driven person.

An attitudinal shift has occurred in the hearts and minds of our youth and one must wonder what has caused it to occur. Times are different. The average family spends less time outside and even less time together than the families of only a few decades ago. This has lead to extreme obesity rates among youth, the highest we have ever seen, a decrease in the physical fitness of our children and a general attitude of indifference to their social responsibilities. (Louv, 2009) When interviewed by Louv, one child stated that “computers were more important than nature, because computers are where the jobs are.” (p. 13)

**Perception of Nature as a Reflection of Cultural Paradigm**

Studies have been conducted all over the world about environmental literacy in our students.

Perhaps the most profound finding sheds light on the changing relationship children have with nature. Richard Louv (2008) in his book, Last Child in the Woods, suggests that children today view nature as something to “watch, to consume, to wear, to ignore.”

Our social paradigm is changing and if we continue to say one thing to our children and act with such disregard, how can we expect the coming generations to improve? We no longer hold nature as sacred perfection. Today science has gene mapped, cloned and modified the very fabric of our being.

“We can no longer assume a cultural core belief in the perfection of nature. To previous generations of children, few creations were as perfect or as beautiful as a tree. Now, researchers flood trees with genetic material taken from viruses and bacteria to make them grow faster; to create better wood products or to enable trees to clean polluted air.” (Louv; 2009, p.23)

Now as much as I would like to suggest that technology is to blame it must be noted that so much of our current acceptable cultural behaviour is at the root of this extreme loss of connection to our planet. Our laws and our government restrict children’s access to nature. Tree-forts cannot be constructed without building permits in many urban centres, camping and fishing in three thousand acres of National Forest is restricted in the presence of a single threatened species of toad, kite flying is banned because it scares away shore birds (Louv, 2009). Don’t get me wrong, it is absolutely essential to protect every species we have left on Earth, but at what cost. If we don’t let kids get back into nature they won’t become activists who want to protect it.
Eco Literacy

**Feature**

### Action Plan for Implementing in the Classroom

**Step 1:**
Conduct a diagnostic survey of student environmental knowledge

**Step 2:**
Teach the background surrounding eco literacy and why it is important to learn it.

**Step 3:**
Introduce Eco Literacy to students

**Step 4:**
Create their culminating activity around an Eco literacy platform. Students will design, implement and evaluate a workshop that they carry out for their peers. See Appendix for example.

**Step 5:**
Conduct a follow-up survey of the students’ environmental knowledge.

### Annotated Bibliography


- This website has several resources for the classroom teacher. Many of the resources are subject specific and with your free online membership you also receive monthly newsletters and access to experts at both the foundation and the Weather Channel. This site has an entire section describing the merits of teaching environmental education and a guide to help you approach it at the secondary level.


- In this journal article the authors studied Korean children’s environmental literacy levels. They examined the variables that affect their environmental literacy using the Environment Literacy Instrument for Korean Children (ELIKC). This instrument was developed to measure four different dimensions: knowledge, attitude, behaviour and skills. Demographic variables were taken into consideration as well. Statistical analysis was conducted and the results indicated that there is a strong correlation between attitude and behaviour and a weak correlation between knowledge and behaviour. It was also determined that gender, parents’ educational background and the source where students learned the environmental knowledge all affected their environmental literacy.


- This site attempts to empower individuals with the knowledge and tools to promote and advocate for more environmental education in the classroom.


- In this article, Julie Ernst discusses environmental-based education (EBE) and the lack of uses by many elementary school teachers. Her biggest findings relate the lack of teaching of EBE to the knowledge base of the teacher and the perceived amounts of time required teaching EBE. Many of the surveys indicated more decisions to avoid EBE in a classroom were based on an emotional connection to EBE and a lack of training in the area, rather than a pedagogical shift against the importance of teaching EBE. She feels that if we provide clear, usable tools more teachers will embrace EBE.


- In this book, Richard Louv tackles the ever increasing lack of connection between children and nature. He coined the term “Nature-Deficit Disorder” to describe children that are so far removed from nature that don’t know what to “do” in it when they are given the chance. Perhaps one of the most poignant quotes from Louv’s research into environmental literacy among youth comes from a fourth-grader in San Diego who stated “I like to play indoors better ‘cause that’s where all the electrical outlets are.” Louv has set the stage, with this book and his research of current data, for a national (US) policy on environmental education.


- This publication was released in January of 2009 as an attempt to bring Ontario schools in-line with the United Nations Millennium Development goal of Sustainable Development. The Ontario Ministry of Education is committed to making environmental education a part of every child’s learning.

**Pe’er, Sara et. al. 2007.** Environmental Literacy in Teacher Training: Attitudes, Knowledge, and Environmental Behavior of Beginning Students.

This journal article reports the environmental attitudes of nearly 800 teacher candidates attending Israeli colleges. The authors focused on the relationship between their attitudes and knowledge of the environment and their environmental behaviour. The study discovered that the students' environmental knowledge was quite limited, and still they seemed to have a very positive attitude to the environment. The authors noticed a correlation between the level of education their parents had and the amount of environmental knowledge the students demonstrated. The authors also noticed that background factors impacted the level of student environmental literacy.


This article explored the current environmental knowledge and attitude of secondary students, separated by gender, in Bangladesh. The authors discovered that girls were more empathetic than boys but boys had a greater knowledge for local environmental concerns. Both boys and girls had a positive attitude towards the environment even though this was not attributable to curricula in schools. Rural schools scored lowest in their ability to foster environmental literacy, only slightly behind that of urban schools.

Sarkar et al suggest that the required knowledge, attitudes and skills can be encouraged in their students through the embracing of environmental literacy. “Thus by budding (an) environmental literate mass, the Earth can remain worth living (on) and we can hope for a sustainable future.” p.3.


This document is a record of the commitment made by the United Nations to the millennium development goals. Goal #7 is a direct statement that address the need to live in a global community that is focused upon creating and keeping a sustainable environment where humans live with nature, not against it.


Michael Wright studied the impact of the teacher on the learning of environmental education. He interviewed and monitored the knowledge, beliefs, attitudes and self-perceptions of two groups of students taking an introductory environmental science course. One group attended a regular lecture series and interacted with a teacher, another took the course independently in a web-based format. He learned that both groups shared a common set of knowledge, beliefs, attitudes and self-perceptions surrounding the environment prior to the course, but a stark contrast after the course. He found the teacher to be a very powerful tool in significantly increasing the knowledge and opinions about our environment of the students taking the course in person. Wright than suggests several ways to improve web-based learning.

Additional Resources


You are Brilliant and the Earth is Hiring
The Commencement Address to the Class of 2009
University of Portland, May 3, 2009
Paul Hawken

When I was invited to give this speech, I was asked if I could give a simple short talk that was “direct, naked, taut, honest, passionate, lean, shivering, startling, and graceful.” No pressure there.

Let’s begin with the startling part. Class of 2009: you are going to have to figure out what it means to be a human being on earth at a time when every living system is declining, and the rate of decline is accelerating. Kind of a mind-boggling situation... but not one peer-reviewed paper published in the last thirty years can refute that statement. Basically, civilization needs a new operating system, you are the programmers, and we need it within a few decades.

This planet came with a set of instructions, but we seem to have misplaced them. Important rules like don’t poison the water, soil, or air, don’t let the earth get overcrowded, and don’t touch the thermostat have been broken. Buckminster Fuller said that spaceship earth was so ingeniously designed that no one has a clue that we are on one, flying through the universe at a million miles per hour, with no need for seatbelts, lots of room in coach, and really good food—but all that is changing.

There is invisible writing on the back of the diploma you will receive, and in case you didn’t bring lemon juice to decode it, I can tell you what it says: You are Brilliant, and the Earth is Hiring. The earth couldn’t afford to send recruiters or limos to your school. It sent you rain, sunsets, ripe cherries, night blooming jasmine, and that unbelievably cute person you are dating. Take the hint. And here’s the deal: Forget that this task of planet-saving is not possible in the time required. Don’t be put off by people who know what is not possible. Do what needs to be done, and check to see if it was impossible only after you are done.

When asked if I am pessimistic or optimistic about the future, my answer is always the same: If you look at the science about what is happening on earth and aren’t pessimistic, you don’t understand the data. But if you meet the people who are working to restore this earth and the lives of the poor, and you aren’t optimistic, you haven’t got a pulse. What I see everywhere in the world are ordinary people willing to confront despair, power, and incalculable odds in order to restore some semblance of grace, justice, and beauty to this world. The poet Adrienne Rich wrote, “So much has been destroyed I have cast my lot with those who, age after age, perversely, with no extraordinary power, reconstitute the world.” There could be no better description. Humanity is coalescing. It is reconstituting the world, and the action is taking place in schoolrooms, farms, jungles, villages, campuses, companies, refugee camps, deserts, fisheries, and slums.

You join a multitude of caring people. No one knows how many groups and organizations are working on the most salient issues of our day: climate change, poverty, deforestation, peace, water, hunger, conservation, human rights, and more. This is the largest movement the world has ever seen. Rather than control, it seeks connection. Rather than dominance, it strives to disperse concentrations of power. Like Mercy Corps, it works behind the scenes and gets the job done. Large as it is, no one knows the true size of this movement. It provides hope, support, and meaning to billions of people in the world. Its clout resides in idea, not in force. It is made up of teachers, children, peasants, businesspeople, rappers, organic farmers, nuns, artists, government workers, fisherfolk, engineers, students, incorrigible writers, weeping Muslims, concerned mothers, poets, doctors without borders, grieving Christians, street musicians, the President of the United States of America, and as the writer David James Duncan would say, the Creator, the One who loves us all in such a huge way.

There is a rabbinical teaching that says if the world is ending and the Messiah arrives, first plant a tree, and then see if the story is true. Inspiration is not garnered from the litanies of what may befall us; it resides in humanity’s willingness to restore, redress, reform, rebuild, recover, reimagine, and reconsider. “One day you finally knew what you had to do, and began, though the voices around you kept shouting their bad advice,” is Mary Oliver’s description of moving away from the profane toward a deep sense of connectedness to the living world.

Millions of people are working on behalf of strangers, even if the evening news is usually about the death of strangers. This kindness of strangers has religious, even mythic origins, and very specific eighteenth-century roots. Abolitionists were the first people to create a national and global movement to defend the rights of those they did not know. Until that time, no group had filed a grievance except on behalf of itself. The founders of this movement were largely unknown—Granville Sharp, Thomas Clarkson, Josiah Wedgwood—and their goal was ridiculous on the face of it: at that
time three out of four people in the world were enslaved. Enslaving each other was what human beings had done for ages. And the abolitionist movement was greeted with incredulity. Conservative spokesmen ridiculed the abolitionists as liberals, progressives, do-gooders, meddlers, and activists. They were told they would ruin the economy and drive England into poverty. But for the first time in history a group of people organized themselves to help people they would never know, from whom they would never receive direct or indirect benefit. And today tens of millions of people do this every day. It is called the world of non-profits, civil society, schools, social entrepreneurship, non-governmental organizations, and companies who place social and environmental justice at the top of their strategic goals. The scope and scale of this effort is unparalleled in history.

The living world is not “out there” somewhere, but in your heart. What do we know about life? In the words of biologist Janine Benyus, life creates the conditions that are conducive to life. I can think of no better motto for a future economy. We have tens of thousands of abandoned homes without people and tens of thousands of abandoned people without homes. We have failed bankers advising failed regulators on how to save failed assets. We are the only species on the planet without full employment. Brilliant. We have an economy that tells us that it is cheaper to destroy earth in real time rather than renew, restore, and sustain it. You can print money to bail out a bank but you can’t print life to bail out a planet. At present we are stealing the future, selling it in the present, and calling it gross domestic product. We can just as easily have an economy that is based on healing the future instead of stealing it. We can either create assets for the future or take the assets of the future. One is called restoration and the other exploitation. And whenever we exploit the earth we exploit people and cause untold suffering. Working for the earth is not a way to get rich, it is a way to be rich.

The first living cell came into being nearly 40 million centuries ago, and its direct descendants are in all of our bloodstreams. Literally you are breathing molecules this very second that were inhaled by Moses, Mother Teresa, and Bono. We are vastly interconnected. Our fates are inseparable. We are here because the dream of every cell is to become two cells. And dreams come true. In each of you are one quadrillion cells, 90 percent of which are not human cells. Your body is a community, and without those other microorganisms you would perish in hours. Each human cell has 400 billion molecules conducting millions of processes between trillions of atoms. The total cellular activity in one human body is staggering: one septillion actions at any one moment, a one with twenty-four zeros after it. In a millisecond, our body has undergone ten times more processes than there are stars in the universe, which is exactly what Charles Darwin foretold when he said science would discover that each living creature was a “little universe, formed of a host of self-propagating organisms, inconceivably minute and as numerous as the stars of heaven.”

So I have two questions for you all: First, can you feel your body? Stop for a moment. Feel your body. One septillion activities going on simultaneously, and your body does this so well you are free to ignore it, and wonder instead when this speech will end. You can feel it. It is called life. This is who you are. Second question: who is in charge of your body? Who is managing those molecules? Hopefully not a political party. Life is creating the conditions that are conducive to life inside you, just as in all of nature. Our innate nature is to create the conditions that are conducive to life inside you, just as all of nature. Our innate nature is to create the conditions that are conducive to life. What I want you to imagine is that collectively humanity is evincing a deep innate wisdom in coming together to heal the wounds and insults of the past.

Ralph Waldo Emerson once asked what we would do if the stars only came out once every thousand years. No one would sleep that night, of course. The world would create new religions overnight. We would be ecstatic, delirious, made rapturous by the glory of God. Instead, the stars come out every night and we watch television. This extraordinary time when we are globally aware of each other and the multiple dangers that threaten civilization has never happened, not in a thousand years, not in ten thousand years. Each of us is as complex and beautiful as all the stars in the universe. We have done great things and we have gone way off course in terms of honoring creation. You are graduating to the most amazing, stupefying challenge ever bequeathed to any generation. The generations before you failed. They didn’t stay up all night. They got distracted and lost sight of the fact that life is a miracle every moment of your existence. Nature beckons you to be on her side. You couldn’t ask for a better boss. The most unrealistic person in the world is the cynic, not the dreamer.

Paul Hawken is a renowned entrepreneur, visionary environmental activist, and author of many books, most recently Blessed Unrest: How the Largest Movement in the World Came into Being and Why No One Saw It Coming. He was presented with an honorary doctorate of humane letters by University of Portland president Father Bill Beauchamp, C.S.C., in May, when he delivered this superb speech. Thanks especially to Erica Linson for her help making that moment possible. www.paulhawken.com
# Butterfly and Cocoon

## Jason Martorino

<table>
<thead>
<tr>
<th>Subject</th>
<th>Lesson</th>
<th>Date</th>
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<tbody>
<tr>
<td>Science, Art</td>
<td>Butterfly and Cocoon (Part 1): Making the Cocoon</td>
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## Curriculum Expectations

Gr. 2 Science — Handling delicate items, life cycle of butterfly, Art - Describing texture, shape, color, symmetry, making 3-D works of art

## Adaptations/Scaffolding

### Learning Styles
- Visual *
- Auditory *
- Kinesthetic *

### Timing

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
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<tr>
<td>Pre-class prep:</td>
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<tr>
<td>- Cut newspaper into strips about 2 inches wide</td>
<td></td>
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<td>- Mix flower and boiling water into paper Mache paste</td>
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<tr>
<td>Intro</td>
<td>10 min.</td>
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<tr>
<td>- You Tube video of butterfly life cycle</td>
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<tr>
<td>- Discussion - what other animals change form in their life cycle? - frog</td>
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<tr>
<td>Demo - Making the cocoon</td>
<td>5 min.</td>
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<tr>
<td>- Dip newspaper strips into paste</td>
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<tr>
<td>- Wrap 10-12 strips around cup to make a cocoon</td>
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<tr>
<td>- Set aside to dry for 1 or 2 days before next step</td>
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<tr>
<td>Do</td>
<td>20 min.</td>
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<tr>
<td>Distribute to each student:</td>
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<tr>
<td>- 1 cup, 1-12 newspaper strips, 1 bowl of paste for 4 students</td>
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<tr>
<td>- Go!</td>
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<tr>
<td>Wrap up</td>
<td>10 min.</td>
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<tr>
<td>- Clean up</td>
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<tr>
<td>- Debrief: You were just making a cocoon. What animal makes a cocoon? Why?</td>
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</tr>
<tr>
<td>NOTE: Paper Mache will need 1 or 2 days to dry before painting and affixing the butterfly</td>
<td></td>
</tr>
</tbody>
</table>

### Materials
- Laptop, projector
- Newspaper, flour, water, bowls
- (1 for 4 students), disposable drinking cup

Jason Martorino is a graduate of OISE/UT
<table>
<thead>
<tr>
<th>Subject</th>
<th>Lesson</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science, Art</td>
<td>Butterfly and Cocoon (Part 2): Painting the Cocoon, and Making the Butterfly</td>
<td></td>
</tr>
</tbody>
</table>

### Curriculum Expectations
Gr. 2 Science — Handling delicate items, life cycle of butterfly, Art - Describing texture, shape, color, symmetry, making 3-D works of art

<table>
<thead>
<tr>
<th>Adaptations/Scaffolding</th>
<th>Modifications</th>
</tr>
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<table>
<thead>
<tr>
<th>Timing</th>
<th>Pre-class prep:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min.</td>
<td>- Cut black construction paper into strips about 1 inch wide</td>
</tr>
<tr>
<td></td>
<td>- Cut colored construction paper in pieces about 23x15cm</td>
</tr>
</tbody>
</table>

#### Activities

**Intro**
- review life cycle of butterfly, add tadpole/frog (You Tube video)

**Demo 1 - Painting the cocoon**
- paint the cocoon white, put aside to dry

**Demo 2 - Making the butterfly (this is a little complicated — you might want to outline the steps on a flow chart for students’ reference later).**
- fold colored construction paper in half, cut shape of butterfly wings symmetrically
- fold black strip across the middle of the wings, leaving some space at the top for the head.
- staple or glue black strip to the wings at the tail or head, fold the head upward (you may want to have them check in with you and let you do this for them, to keep them on track)
- design the pattern of the wings
- when cocoon is dry, affix the tail of the butterfly to the top of the cocoon using a staple or other adhesive means

**Do**
- give each student a black strip, and let them choose their own color for wings
- give each group of tables some markers and designing stickers, etc.

25 min.

**Wrap up**
- Clean up
- Debrief: sit in a class group, talk about the shapes, colors and textures of the materials you used for your piece. Do they think that’s how a real butterfly and cocoon feel?
- pair share: talk to a partner about their butterfly and cocoon

**Total Time:** 60 min.

<table>
<thead>
<tr>
<th>Learning Styles</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual *</td>
<td>Construction paper:</td>
</tr>
<tr>
<td>Auditory *</td>
<td>- Black: 1 2x23cm piece per student</td>
</tr>
<tr>
<td>Kinesthetic *</td>
<td>- multi colors</td>
</tr>
</tbody>
</table>

- White paint, paintbrushes

- stapler/glue

- Markers, Stickers for decorating butterfly
Oil Spill on Water
Corrie Graham and Jennifer Baldwin

Science and Technology
Grade Level: 4
Unit of Study: Understanding Life
Systems: Habitats and Communities
Expectations:
1.1 Analyse the positive and negative impacts of human interactions with natural habitats – Oil is an important source of energy; however dumping of oil into water sources during transportation occurs frequently. This affects habitats for many water-based animals such as fish, birds and humans;
1.2 Evaluate impact of oil dumping on the natural community and propose possible actions of cleaning up an oil spill;
2.1 Develop safety procedures for proper disposal of crude waste;
2.4 Use scientific inquiry to determine the effects of oil mingling in water sources where animals live.

Demonstration Criteria
Hypothesize and determine the effects of adding oil to water through experimentation
Determine possible solutions for absorbing oil from water
Assess the impact of oil on water on wildlife

Equipment Needed:
White construction paper
Food coloring
Aluminum roasting pan
Flat baking pan
Clear cooking oil
Plastic containers
Fork
cotton pads, chopsticks

Required prior background information/skills
Students should study water habitats, density of various liquids.

Methodology
1. Set out three plastic containers. Measure one tablespoon of cooking oil and one teaspoon of food colouring into each container. Beat the mixture with the fork until the food coloring is well mixed. It takes time, about 3 minutes. Use one colour, two colours, or more.
2. Fill the aluminum pan with water just a few millimeters deep.
3. Pour some of the food colouring/oil mixture onto different areas of the water in the pan.
4. Lay a piece of the construction paper on top of the water. After thirty seconds or so, carefully lift it off.
5. Hang the marbled paper up with a clothespin and let it dry for a few hours.
6. Use a cotton pad, chopstick or other item to see if any of these items absorb oil from the water.

Adapted from Home Demo No. 9 on www.nyelabs.com.

Safety concerns:
Food dye stains. Students may want to use latex gloves or a cover over their clothes in case of spills.

Discussion
Discuss how different amounts of oil interact with the water.
Discuss how oil and water affects the paper dipped in the solution.
If the paper was an animal, how would this mix impact the animal? What might this mean for wildlife dependant on water habitats that have been contaminated with oil?

Extension activity
Students can use this activity as an art project – marbelling paper to use for making origami, writing paper.

References
www.nyelabs.com Home Demo No. 9 – Marvellous Marbelling or Teaching Green The Elementary Years, 2005

Corrie Graham and Jennifer Baldwin are graduates of OISE/UT
Science and Technology
Grade 5
Understanding Earth and Space Systems; Conservation of Energy and Sources

Overall Expectations
2 Investigate energy transformation and conservation;
3 Demonstrate an understanding of the various forms and sources of energy and the ways in which energy can be transformed and conserved.

Specific Expectations
2.3 use technological problem-solving skills to design, build and test a device that transforms one form of energy into another.

How it Works
Drop marble down an angled foam board that has a guiding track (two chopsticks glued to create guiding walls). Gravitational energy transforming into kinetic.

Marble rolls onto second foam board (placed on flat-seated chair with end of board at edge of chair) and hits series of dominos (kinetic and sound energy).

Last domino in series is weighted by glued marble. It falls into jar resting over edge of chair, held delicately between two sticks embedded into end of board.

The weight of the marble/domino causes jar to fall towards floor (kinetic to gravitational).

As jar falls, dental floss (secured to jar, run through eye screw attached to domino glued flat at edge of third foam board that is resting on another chair seat and attached to hammer) pulls the hammer.

Hammer hits bell, creating sound energy.

Follow-up Activity
Have students keep running record over a few days of energy transformations they witness at home or in environment. Share with class.

Prior Knowledge
Awareness of the various types of energy in our environment, ie. kinetic, sound, gravitational.

Materials suggested:
3 foam boards (30 x 15 x 2.5 cm)
@ 10 chopsticks
@ 8 dominos
2 marbles
small magnet
dental floss
ointment/plastic jar
1 eye screw
bell
toothpicks
drill and glue (for construction)

Laura Medcalf is a graduate of OISE/UT
Investigating an Oil Spill
Paul Alemparte, Laura Cloutier, Michal Golan, Matt Lawson

Science and Technology
Grade 5
Understanding Life Systems: Habitats and Communities

Big Idea
• Changes to habitats (whether caused by natural or human means) can affect plants and animals and the relationships between them.

Specific Expectations
1.1 analyze positive and negative impacts of human interactions with natural habitats and communities;
2.3 use scientific inquiry/research skills to investigate ways in which plants and animals depend on features of their habitat to meet important needs;
3.1 demonstrate an understanding of habitats as areas that provide plants and animals with the necessities of life.

Purpose
To examine how human interaction has an effect on animal and plant habitats. This would be a good jumping off point for talking about what we can do as humans to minimize our negative impact on animal and plant habitat.

Materials
For each simulation (one per group of students) – one large aluminum cooking pan, 2 cups vegetable oil, 3-4 tsp of black powdered tempera paint (food colouring will not work), glass jar for the paint, 3 cups sand, 3 straws, string, paper towels, spoons, cups, water.

Teacher Preparation
Mix the oil and the paint in the glass jar and shake well to mix.

Procedure
Have students form a slope of sand at one end of the aluminum pan to simulate an ocean shore. Partially fill the pan with water (about 2.5 cm) up to the sandy ‘beach.’ Pour the oil into the water near the beach. Students rock pans back and forth gently to produce waves and observe the behaviour of the oil. Students should quickly realize that oil forms slicks that travel on the surface of the water.
Ask students to experiment with different tools to try to find the best way to clean up the oil, such as sponging the surface with paper towels or skimming it from the surface with spoons or cups.
Introduce the concept of an oil boom which is a tool used to contain an oil spill by creating a physical barrier around the oil on the surface of the water. Have students make their own booms by cutting 3 plastic straws in half and feeding string through the halves, tying the string together to close the boom. They can then attempt to contain the oil using the boom.

Follow Up Questions/Extensions
In what ways can the oil spilled at sea be carried to beaches?
Which method worked best in cleaning up the oil?
Did anything really work?
What would be most affected by oil spills? Why?
What are some ways we could prevent this from happening?

Source

Paul Alemparte, Laura Cloutier, Michal Golan, and Matt Lawson are graduates of OISE/UT
Science and Technology
Grade Level: 5
Understanding Earth and Space
Systems: Relating Science and Technology
to Society and the Environment
Specific Expectations:
1.1 Analyze the immediate and long-term impacts
on society and the environment of human uses
of energy and natural resources, and suggest
ways to reduce these impacts.

Source
Modified from Teaching Green –The Elementary
Years, 2005.

Criteria
The purpose of this experiment is to replicate an oil
spill near the ocean shore, see its effects on various
animals, and find clean-up solutions.

Equipment Needed
One large aluminum cooking pan
500ml (2 cups) of vegetable oil
3-4 teaspoons of black powdered tempera paint
Glass jar
Approximately 750ml (3 cups) sand
3 straws, string, paper towels, spoons, cups,
sponge, feathers
Tap water
Beige panty hose
Hair–like material

Required Background Information
Students would be introduced to this experiment
by first exploring the many harmful effects of oil
spills onto the ocean life followed by a discus-
sion on how people around the globe depend
on oil. The many uses of oil ranging from heat-
ing homes to fueling homes would be discussed
highlights the importance of oil. Some causes
of oil leaking, being spilled and dumped into
the ocean will also be examined with stu-
dents. A read-aloud titled Spill! The Story of
the Exxon Valdez by Terry Carr and Prince
William by Gloria Rand would be read to the
class to begin the unit on oil spills. These books
would provide students with the background
knowledge to understand the impact of oil spills
on the ocean and wildlife.
The history of oil spills can be researched to in-
clude visuals and documented footage of past
oil spills.

Methodology
Form a slope of sand at one end of the large alumi-
num cooking pan.
Fill the pan with water about 2.5cm high. (mix
vegetable oil with powder tempera) Pour about
500ml of imitation crude oil into the water.
Rock the pan back and forth gently.
Discussion about the ways the oil spilled at sea
reaches the shore.
Discuss effects on animals and their habitats.
Attempt different ways of cleaning up the oil spill
using the paper towel, cups, and spoons.
Create an oil boom using three straws tied together
with string and place it in the water/oil spill to
contain the oil.
Create hair bags using hair-like substance and
panty hose to check absorption.

Safety
All materials should be kept away from the face;
mouth, nose, eyes, skin and ears.
Caution should be taken to area around the experi-
ment site as vegetable oil is slippery and can be
a hazard if spilled.
Any allergies need to be taken into account.

Follow-up activities/ extension/
discussions
An extension to this experiment would require stu-
dents to discover other methods of cleaning up
oil spills. Some suggestions using tools such as
spoons, cups and sponging with paper towels
would be made and students would attempt
cleaning using these instruments as well as
employing their own techniques. Students can
be introduced to the concept of oil bloom as an
alternative tool to contain an oil spill. Students
would create the oil bloom and attempt to
 clean the oil using this new method.
After the experiment, a discussion would follow
illustrating how the oil spilled at sea would
eventually travel to beaches by currents, tides
and waves. Students will discuss the most effec-
tive way of cleaning up the spill if any. Students
would also discuss the difficulties they experi-
enced in cleaning up the oil spill.
As a follow up activity students would be encour-
aged to reflect on the experiment and expand
on this unit be bringing in research and articles
that discuss the issue of oil spill on wildlife
and plants. Through this process, students can
make connections to their learning and how it
applies to real life situations.

Ajit Kamila and Daniel Stern are graduates of OISE/UT
SpOILing our Seas
Marina Nikolovski

Science and Technology
Grade: 6

Understanding Life Systems:
Biodiversity; Relating Science
and Technology to society and the
environment

Expectations
Analyze local issues related to biodiversity, taking
different perspectives; describe interrelationships
with species;

Source
Modified from Eco-Fun, 2001.

Criteria
To illustrate how oils spills cause harmful effects to
parts of the environment and how technology cannot
completely correct mistakes causing pollution.

Notes to Teachers
Many of our rivers, lakes and seas are exposed
to oil spills in varying degrees. Oil tankers crack,
factories leak, there are may reasons why oil goes
into our water. Try creating a mini oil spill and if
you can clean it up.

Ask for volunteers to be part of the experiment/
story. You will need someone to act as wind, Eco
crew one (cotton cleaning device), Eco crew two
(nylon stocking device), Glysineray (dish soap
dispenser).

Required background:
To understand oil, how humans use it, how its
transported and why oil spills happen, visit the sites
below:
Office of Response and Restoration: http://
response.restoration.noaa.gov/topic_sub-
topic_entry.php?RECORD_KEY(entry_subtop-
ic_topic)=entry_id,subtopic_id,topic_id&entry_id(entry_subtopic_topic)=184&subtopic_id(entry_subtopic_topic)=8&topic_id(entry_subtopic_topic)=1
Kids and Energy: www.kids.esdb.bg/oil.html
Ducks Unlimited: www.ducks.ca

Materials needed:
aluminum foil pans
water
recyclable plastic water bottle, cut ½ - 1 inches
from bottom and recycle the rest
food colouring (optional)
measuring spoons
cooking oil
feathers
cotton rags
nylon stocking
paper towel
dish washing liquids

Methodology
This can be told as a story if desired (see story
line); otherwise you can follow direct instruction
only. Volunteers are required to assist/play different
roles.

Safety
Ensure oil or water does not spill on the floor, as it
may cause slips and/or falls.

Suggested follow-up activities
Observation and reflection on demonstration (be-
fore, during, after)
Discussion on the importance of oil and alternative
energy; the interactions between species and
the sea and how oil may effect that relationship
Cost and time analysis of cleaning up oil spills
(environmental cost, cost of various cleaning
technologies and materials, time efficiency)
Find article on man made disasters (such as oil
spills) and use this information to write to oil
companies, boaters’ associations, and eco con-
servation organizations about this issue.
<table>
<thead>
<tr>
<th><strong>Direct Instruction:</strong></th>
<th><strong>Story line (in synch with instruction)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fill the pan halfway with water (optional: Add a few drops of food colouring. Blue or green usually contrasts best with yellow)</td>
<td>Across the waters and across the seas various species live. Over the top, a buoyant ship, makes deliveries.</td>
</tr>
<tr>
<td>2. Add $\frac{1}{2} - \frac{3}{4}$ of a teaspoon to the cut plastic bottle.</td>
<td>The SS Exscom ships its load across the sea, carrying gallons of oil for you and me.</td>
</tr>
<tr>
<td>3. Cause an oil spill, by tipping the container (ship) and spilling oil into water. (you can ask how do oil and water interact)</td>
<td>There was a problem the day the shipment went out, the tides were too high, the tides were too rough. The tides smacked the SS Exscom, the ship cracked. The SS Exscom spilled its oil and didn’t take it back.</td>
</tr>
<tr>
<td>4. Blow the water gently. (you can ask them to talk or write their observations on what is happening)</td>
<td>So the oil stayed, but the sea became stormy. The winds they blew across the way until morning.</td>
</tr>
<tr>
<td>5. Drag feathers through the oil. (The feathers represent birds -you can ask them to talk or write their observations on what is happening)</td>
<td>Look. There are some ducks, but they didn’t know about the cracked ship. So they went on with their day, eat and sip. Oh my friends, what’s happened to these birds? (asking crowd). Take a look and observe. (have a discussion)</td>
</tr>
<tr>
<td>6. Try to clean up the oil spill with various technologies. Technologies: cotton rag (try this first), nylon stocking (try this next). (Ask them what happened when these ‘technologies’ were used)</td>
<td>Perhaps there is hope, lets call in the crews, to see what they can do. Eco Crew one, tried to clean it up. What’s happened my friends, did they do a good job? (asking crowd; have a discussion) Eco crew two came by, did they day save the day? (asking crowd, have a discussion)</td>
</tr>
<tr>
<td>7. Repeat step 2 and 3. Add $\frac{1}{2} - 1$ teaspoon of dish washing liquid. (Have a discussion, students to see the positive and negative side of this option)</td>
<td>Maybe, Glysineray could save the day. Lets see what happens with a shorter replay (have a discussion with students to see the positive and negative side of this option)</td>
</tr>
</tbody>
</table>

Marina Nikolovski is a graduate of OISE/UT
Honey

Honey is the only food on the planet that will not spoil or rot. It will do what some call turning to sugar. In reality honey is always honey. However, when left in a cool dark place for a long time it will do what I rather call "crystallizing".

When this happens, loosen the lid, boil some water, and sit the honey container in the hot water, off the heat and let it liquefy. It is then as good as it ever was.

Never boil honey or put it in a microwave. To do so will kill the enzymes in the honey.

Cinnamon and Honey

Facts on Honey and Cinnamon:

It is found that a mixture of honey and cinnamon cures most diseases. Honey is produced in most of the countries of the world. Scientists of today also accept honey as a 'Ram Ban' (very effective) medicine for all kinds of diseases.

Honey can be used without any side effects for any kind of diseases.

Today's science says that even though honey is sweet, if taken in the right dosage as a medicine, it does not harm diabetic patients.

Weekly World News, a magazine in Canada, in its issue dated 17 January, 1995, has given the following list of diseases that can be cured by honey and cinnamon as researched by western scientists:

Heart Disease

Make a paste of honey and cinnamon powder, apply on bread, instead of jelly and jam, and eat it regularly for breakfast. It reduces the cholesterol in the arteries and saves the patient from heart attack. Also, those who have already had an attack, if they do this process daily, they are kept miles away from the next attack. Regular use of the above process relieves loss of breath and strengthens the heart beat. In America and Canada, various nursing homes have treated patients successfully and have found that as you age, the arteries and veins lose their flexibility and get clogged; honey and cinnamon revitalize the arteries and veins.

Arthritis

Arthritis patients may take daily, morning and night, one cup of hot water with two spoons of honey and one small teaspoon of cinnamon powder. If taken regularly even chronic arthritis can be cured. In a recent research conducted at the Copenhagen University, it was found that when the doctors treated their patients with a mixture of one tablespoon honey and half teaspoon cinnamon powder before breakfast, they found that within a week, out of the 200 people so treated, practically 73 patients were totally relieved of pain, and within a month, mostly all the patients who could not walk or move around because of arthritis started walking without pain.

Bladder Infection

Take two tablespoons of cinnamon powder and one teaspoon of honey in a glass of lukewarm water and drink it. It destroys the germs in the bladder.

Cholesterol

Two tablespoons of honey and three teaspoons of cinnamon powder mixed in 16 ounces of tea water, given to a cholesterol patient, was found to reduce the level of cholesterol in the blood by 10 percent within two hours. As mentioned for arthritic patients, if taken three times a day, any chronic cholesterol is cured. According to information received in the said Journal, pure honey taken with food daily relieves complaints of cholesterol.

Colds

Those suffering from common or severe colds should take one tablespoon lukewarm honey with 1/4 spoon cinnamon powder daily for three days. This process will cure most chronic cough, cold, and clear the sinuses.

Upset Stomach

Honey taken with cinnamon powder cures stomach ache and also clears stomach ulcers from the root.

Gas

According to the studies done in India and Japan, it is revealed that if honey is taken with cinnamon powder the stomach is relieved of gas.
Immune System
Daily use of honey and cinnamon powder strengthens the immune system and protects the body from bacteria and viral attacks. Scientists have found that honey has various vitamins and iron in large amounts. Constant use of honey strengthens the white blood corpuscles to fight bacterial and viral diseases.

Indigestion
Cinnamon powder sprinkled on two tablespoons of honey taken before food relieves acidity and digests the heaviest of meals.

Influenza
A scientist in Spain has proved that honey contains a natural ‘ingredient’ which kills the influenza germs and saves the patient from flu.

Longevity
Tea made with honey and cinnamon powder, when taken regularly, arrests the ravages of old age. Take four spoons of honey, one spoon of cinnamon powder, and three cups of water and boil to make like tea. Drink 1/4 cup, three to four times a day. It keeps the skin fresh and soft and arrests old age. Life spans also increase and even a 100 year old, starts performing the chores of a 20-year-old.

Pimples
Three tablespoons of honey and one teaspoon of cinnamon powder paste. Apply this paste on the pimples before sleeping and wash it next morning with warm water. If done daily for two weeks, it removes pimples from the root.

Skin Infections
Applying honey and cinnamon powder in equal parts on the affected parts cures eczema, ringworm and all types of skin infections.

Weight Loss
Daily in the morning one half hour before breakfast on an empty stomach, and at night before sleeping, drink honey and cinnamon powder boiled in one cup of water. If taken regularly, it reduces the weight of even the most obese person. Also, drinking this mixture regularly does not allow the fat to accumulate in the body even though the person may eat a high calorie diet.

Cancer
Recent research in Japan and Australia has revealed that advanced cancer of the stomach and bones have been cured successfully. Patients suffering from these kinds of cancer should daily take one tablespoon of honey with one teaspoon of cinnamon powder for one month three times a day.

Fatigue
Recent studies have shown that the sugar content of honey is more helpful rather than being detrimental to the strength of the body. Senior citizens, who take honey and cinnamon powder in equal parts, are more alert and flexible. Dr. Milton, who has done research, says that a half tablespoon of honey taken in a glass of water and sprinkled with cinnamon powder, taken daily after brushing and in the afternoon at about 3:00 P.M. when the vitality of the body starts to decrease, increases the vitality of the body within a week.

Bad Breath
People of South America, first thing in the morning, gargle with one teaspoon of honey and cinnamon powder mixed in hot water, so their breath stays fresh throughout the day.

Hearing Loss
Daily morning and night honey and cinnamon powder, taken in equal parts restores hearing. Remember when we were kids? We had toast with real butter and cinnamon sprinkled on it!

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Do We Really Need Father Time and Mother Nature Any More?

Mother Earth and Father Time
How very special are we –
For just a moment to be
Part of life’s eternal rhyme
How very special are we
To have on our family tree
Mother Earth and Father Time
He turns the seasons around
And so she changes her gown
But they always look in their prime
They go on dancing their dance
Of everlasting romance
Mother Earth and Father Time
The summer larks return to sing
Oh, what a joy to live
How very special are we
For just a moment to be
Part of life’s eternal rhyme
How very special are we
To have on our family tree
Mother Earth and Father Time

~from Charlotte’s Web

Most of us associate time with Father Time, a masculine entity. He is often portrayed as an old bearded man who has seen lots of time pass in his life. Alternatively, Mother Nature is now viewed as a young, nurturing woman, now even in contemporary advertisements. Why don’t we consider a reversal of those roles? Is it now time to stop personifying Time and Nature? Are these personifications of Time and Nature now outdated?

“Middle ages is the awkward period when Father Time starts catching up with Mother Nature.” Harold Coffin

Father Time is often seen as a baby boy at the start of a calendar year and an old bearded man, wearing a robe, often with a sickle, cane, and/or hour glass in his hands, as the year winds down. The presence of an elderly man signifies that he has little time left in the current year, his life time.

“Every girl should use what Mother Nature gave her before Father Time takes it away.” Dr. Laurence J. Peter

Mother Nature (sometimes known as Mother Earth) is a common representation of nature that focuses on the life-giving and nurturing features of nature by embodying it in the form of the mother. Images of women representing Mother Nature are timeless. For the medieval, she was only a personification, not an actual goddess. The modern concept of nature, all inclusive of all phenomenon, has returned to its original pre-Socratic roots, no longer a personification or deity except in a rhetorical sense, a bow to her illustrious traditions in Greek myth. Mother Nature is often invoked when weather turns very nasty or when something very positive happens in the natural world. For example, the Abbotsford (BC) News ran a story in November 2009, titled “Final huff from Mother Nature: Mother Nature pounded the Valley hard early this week, with the three-day storm expected to ease after a final round of high wind last night.” If the weather is fine, then Mother Nature is smiling down on us. Mother Nature is now used to sell baby products, pet care products, pest control services, child care services, and even gardening services.

I’m here to suggest that we, as environmentalists and scientists, abandon the outdated personification of both time and nature. Even though some scientists still capitalize the word nature to give the word some additional stature, to assign a gender to time or nature pre-supposes that the other gender is somehow unable to signify the passage of time or nurturing of young. So, I’m going to use my scientific and educational background to officially bid goodbye to Father Time and Mother Nature. Time and Nature are now and will always be genderless in my house.

Mike Morris is Chair, Editorial Board, Interactions: The Ontario Journal of Environmental Education
April 29, 30, May 1, Seneca College, King Campus

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