Wherever you teach… just outside your door…exist learning opportunities...

…that will inspire and engage your students …to learn more than most people think possible.

It’ that simple.

Open the door to your school and …

Step Outside for Learning!
Overview

1. Introductions and how it works
2. Biodiversity - the opportunities nature provides us as facilitators of learning
3. Primary class examples
4. Junior class examples
5. Belfountain P.S. - a whole school approach
6. Get connected and step outside with your class
Why Biodiversity?

- Biodiversity: Life in all its variety
- Biodiversity: Nature’s life support system
- Biodiversity: We’re a part of it, too!

Getting to Biodiversity:

- Ontario’s Biodiversity Strategy
- Action Items for Education and Awareness
- BEAN is born…BEAN sprouts?
Biodiversity Outside our Doors

- **Genesis:** Going Green “Summer Camp”
- **The Calendar:** “What’s happening *right now,* somewhere nearby?”
- **Calendar Setup:**
  - Featured Species or Process
  - Other Happenings
- **Debt of gratitude to Drew Monkman**
Calendar Example: Late November

A View from the Kawarthas: Late November

Featured process: frolics. During that last rainy, warm spell a week or so ago, I saw two frogs hopping across the road while I was on my way home. By now, buried in leaf litter, they’ve probably turned into frolics. As the temperature plummeted, Wood Frogs and Spotted Salamanders among others, fill their bellies with gorm, a natural antifreeze derived from sugar. This allows more heat the water in a frog to freeze, without disrupting cells, tissues or organs. Breathing and heartbeat slows as they become little blocks of ice, which can then and become active again in as little as an hour (note: watching this video, except at the very end, is something akin to watching paint dry; still, it’s very cool).

Here’s a good 4.5 minute PBS segment on the same phenomenon, with some good, time-lapse footage.

Here are some other fifty ways that amphibians and reptiles get through the winter:

<table>
<thead>
<tr>
<th>Method</th>
<th>Heretofore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overwinter in mud at bottom of ponds and marshes</td>
<td>Green Frog, Bullfrog, Mink Frog, Snapping Turtle, Millipede, Painted Turtle, Musk Turtles (those turtles are true hibernators)</td>
</tr>
<tr>
<td>Overwinter in mud at bottom of streams and rivers</td>
<td>Leopard Frog</td>
</tr>
<tr>
<td>in loose soil, burrows or crevices below the frost line</td>
<td>American Toad, Red-backed Salamander, Blue-spotted Salamander, snakes</td>
</tr>
<tr>
<td>Other quick-frozen critters</td>
<td>Chorus Frog, Gray Treefrog, turtle hatchlings that overwinter in nest: Painted Turtle, Eastern Box Turtle, Snapping Turtle (very occasional), possibly Blanding’s Turtle</td>
</tr>
<tr>
<td>Semi-active in water</td>
<td>Aquatic salamanders</td>
</tr>
</tbody>
</table>

Other happenings:

- Now that most of the leaves are down, basket-sized nest balls are very evident in some trees. These are actually squirrel nests (Red or Eastern Gray), and are called aboya. They are lined with shredded vines and grasses, and may have a floor of twigs. Here’s a view in cross-section. Squirrels will also utilize cavities in trees, adapt old crow’s nests or even use large bird boxes. Red Squirrels will also burrow underground, often in a scale midden (note the burrow entrance) that they produce by shredding cones to get at the seeds. By doing this in the same place, year after year, a midden balls up. If you go quietly enough through the woods, you can often hear Red Squirrels leaving those cones apart with their teeth. Squirrels are active all winter, hunkering down only in the worst weather.

- Blas Kozak reminds me that crows are migrating. Look for flocks high in the sky, moving towards the southeaster. Over 200,000 crows gather each winter in a number of roosts in Essex and Chatham-Kent Counties, near Windsor. For some hypotheses on why crows do this, go here and scroll down a bit.

- Migrating Bald and (more occasionally) Golden Eagles are arriving here in the Kawarthas, and may visit your area as well. As northern lakes and rivers freeze, these birds are forced south to look for food. Areas of high deer populations attract eagles, as they will scavenge or carrion. They will also feed on dead fish and ducks, or ducks either frozen in ice, or unable to take off across it. A good place to look for eagles is your local dump early in the morning.

- The first significant snowflakes have already happened in some areas, and just today I noticed the first fringe of ice on some of the lakes on the way to work. It probably won’t stay, but freeze-up may not be that far away. Snow and ice make things harder for some living things, and easier for others (see eagles above). We will address some of these as time goes on. Keep an eye on your local lakes and ponds, and note when they freeze over for the winter. Keep those dates for comparison next year, and see if you can find data for past years. Are there any trends?

- Meanwhile, snowflakes come in many shapes and sizes, depending on the atmospheric conditions where they formed, and as they made their way to the ground. Go outside during a light snowfall, and watch flakes on jacket sleeves or mitts (but perhaps not hangers), and look at them through a magnifying lens. Here’s a great site about snowflakes ... you can even watch snowflakes grow. Activities for kids can be found here.
Calendar: How it Works

- **Featured Process:** Frogsicles (late November)
  - Focusing on what’s *not* there
  - Finding nifty *sites*
  - Expanding to other strategies/species

- **Other Happenings:** Squirrels
  - Focusing on what’s *definitely* there: leaf balls
  - Expanding out: red squirrel middens
Calendar: How it Works

- Other Happenings: freeze-up
  - Focusing on things they can observe, measure, record and compare
  - Connecting to others: IceWatch

- Other Happenings: snowflakes
  - Focusing on how things work; observation
  - Seeing what you can’t normally see
  - A little humour never hurts
Pedagogical Rationale

- Student engagement – Real-world link for learning
- Readily available and inexpensive
- Supports inquiry
- Opportunity to address many subject expectations – an integrated context
Primary Examples

- Schoolyard Safari
- What season is it? -looking for evidence
- Changing schoolyard spots
- Staying Warm in Winter
- Movement in Winter
- Bug Party with Kindergartners
Grade 2 Investigation
How should we treat animals?

Guiding questions

1. What do animals need to live including us?
2. What parts do animals have to help get what they need to live?
3. Why do some animals live in certain places?
4. What are some animal life cycles and how do they change during them?
5. How do we help and hurt other animals?
Now that most of the leaves are down, basketball-sized leaf balls are very evident in some trees. These are actually squirrel nests (Red or Eastern Gray), and are called drey. They are lined with shredded vines and grasses, and may have a floor of twigs. Here’s a view in cross-section. Squirrels will also utilize cavities in trees, adapt old crow’s nests or even use large bird boxes. Red Squirrels will also burrow underground, often in a scale midden (note the burrow entrance) that they produce by shredding cones to get at the seeds. By doing this in the same place, year after year, a midden builds up. If you go quietly enough through the woods, you can often hear Red Squirrels tearing these cones apart with their teeth. Squirrels are active all winter, hunkering down only in the worst weather.
An schoolyard inventory of squirrels and dreys is planned

- Real science process
- Adds to our inquiry to learn about animals
- Gets us outside for 20 minutes
- Highly engaging
Shared observations lead to the class story

- Engaging content for student reading has been generated.
- Our inquiry has been advanced based on primary observations.
The result

Spontaneous learning combustion!

- students furthering learning on their own on their own time.
Junior Examples

Praying Mantis Celebration
"Moon of the ..." storybook creation
Solo spots and journals
Colour poetry
Clay Critters
Monitoring temperatures and creating scatter plots
Stream analysis
Bird feeders on Pulley systems
Solo Spot Ideas

- Lie down in the grass or beside a tree and close your eyes
- Play with a colour poem
- Would you like to try sketching?
- Hold a slide frame to your eyes
- Write a letter to your future self
Moon Cycles

- January - Moon of the ….
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
<td>Sept</td>
<td>Oct</td>
<td>Nov</td>
<td>Dec</td>
<td>Jan</td>
<td>Feb</td>
<td>March</td>
<td>April</td>
<td>May</td>
<td>June</td>
</tr>
<tr>
<td>EARTH</td>
<td>insects</td>
<td>observing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>praying mantis</td>
<td>eating, mating, egg case</td>
<td>eating, mating, egg case</td>
<td>hatching</td>
<td>hatching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>butterflies</td>
<td>eggs, larvae, migration (Journey South), cocooning</td>
<td>disappearing</td>
<td>reappearing, watch for Mourning Cloak</td>
<td>other species appearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>frogs</td>
<td>observing</td>
<td>disappearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>toads</td>
<td>observing</td>
<td>disappearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>snakes</td>
<td>observing</td>
<td>disappearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fish</td>
<td>observing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>birds</td>
<td>migration (Journey South)</td>
<td>migration (Journey South), feeders</td>
<td>migration (Journey South)</td>
<td>feeding, G. H. Owls mating</td>
<td>feeding, G. H. Owls mating</td>
<td>owl pellets, G.H. owl's nesting</td>
<td>migration (Journey North)</td>
<td>migration (Journey North)</td>
<td>migration (Journey North)</td>
</tr>
<tr>
<td></td>
<td>animals</td>
<td>footprint casts</td>
<td>footprint casts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sky</td>
<td></td>
<td></td>
<td></td>
<td>dark hours</td>
<td>night sky</td>
<td>observing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sun</td>
<td>Sept. 22 Autumnal equinox</td>
<td>decreasing light hours; tracking position of sun when setting</td>
<td>Dec. 21 Winter solstice, sundial</td>
<td>solar energy</td>
<td>increasing light hours</td>
<td>Mar 20. Vernal Equinox</td>
<td></td>
<td></td>
<td>June 21 Summer Solstice</td>
<td></td>
</tr>
<tr>
<td>heat</td>
<td>air, river warm</td>
<td>temp. dropping</td>
<td>temp. dropping</td>
<td>cold, ice</td>
<td>cold, ice</td>
<td>cold, ice</td>
<td>cold, ice</td>
<td>melting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step further - A whole school approach

- Putting place-based learning into practice
Belfountain Public School’s Journey

- **2006**  Pilot Project with two classes – grade 3 and 6
- **2007**  Whole school Adoption in all classes
- **2008/09**  Consolidation
- **2010**  Striving for regional school status
The opportunities

- All subject learning objectives can be addressed through the opportunities that the built, cultural and natural environment provides within steps of the school.

- Transdisciplinary integrated learning reflects the real-world.

- A level of student engagement that is inspiring.
Addressing the Challenges

- Many curriculum expectations
- Time for planning to access the community
- Assessment and Evaluation
Get connected and step outside with your class

- How to get connected to this project and receive the emails
  - contact Alan Crook  alan.crook@ontario.ca

- The Belfountain Public School Experience
  - contact Jiiva Somerville  jiiva.somerville@peelsb.com

- Upcoming - Sign on through the R4R website - a project of Learning for a Sustainable Future
  - Stan Kozak  skozak@sentex.ca

- Transdisciplinary Integration
  - Pamela Gibson  pamela@clipsham.com