Learning and Teaching Through the Naturalist Intelligence

By Maggie Meyer

The sun shines not on us, but in us. The rivers flow not past, but through us. —John Muir

The Naturalist Intelligence

A naturalist feels connected. John Muir explains in two sentences a concept vital for the survival of all living things. We are related to everything in our environment. Understanding the naturalist intelligence and cultivating it within our students is our responsibility not only as teachers but also as human beings.

Howard Gardner defines a naturalist as a person who recognizes flora and fauna plus other consequential distinctions in the natural world and uses this ability productively. In our culture the term naturalist is applied to people who have an outstanding knowledge of the living world. The importance of the naturalist intelligence is well established in evolutionary history. Gardner has mentioned Charles Darwin and E. O. Wilson as his end states. Rachel Carson, Sylvia Earle and Jane Goodall would be great end stateswomen too.

The Novice Naturalist

I am not a science teacher. I never liked science in school. I never experienced much success. However, I am a sixth grade teacher in an elementary setting so I have to teach science. That was a problem until I was introduced to Howard Gardner’s Theory of Multiple Intelligences and the GREEN network of teachers a few years ago. I now understand that students learn in a variety of ways. They have intelligence strengths and weaknesses. I now have a network of professionals I can rely on for support when I need mentoring.

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with science facts, skills and knowledge.

GREEN stands for Global Rivers Environmental Educational Network. The name is confusing but the model isn't. GREEN is a group of very dedicated science teachers working with an integrated watershed based curriculum. The network stresses watershed stewardship across the US and internationally. This collection of teachers encompasses five school districts in the watersheds of the South Sound Region of Washington State. A consortium of public and private organizations have provided funding for an education coordinator. She is the vital communication link that binds the scattered teachers together.

I'm sure Howard Gardner would consider this position a true "school - community broker". These networked teachers are true naturalists. I am not. I just sneak around in their shadows and soak in their encouragement.

I was in the audience sitting with a fellow GREEN teacher when Gardner unveiled the Naturalist Intelligence at the National ASCD Conference in Baltimore last year. He confirmed something we already knew. Some kids just seem connected to the outdoors. We were already in the process of hooking students into integrated lessons based on an emotional connection and authentic learning. We immediately wanted to jump up and share what we were seeing in our classrooms.

Observation is a skill I have yet to develop. Even though I'm not very experienced at knowing the natural environment I'm trying desperately to provide my sixth grade class with opportunities to learn and be outside. By providing my kids with trips for field studies I personally have experienced a high learning curve. A former special needs student could identify any bird that flew over. I asked him how he knew and he gave me a five minute lesson on shapes of heads, tails, body coloring, silhouettes and bird calls. I was stunned. This kid was learning. He spent lots of time observing outside.

Family members provided him with the names and information much like folklore was passed down from generation to generation. No standardized test would give him the score he deserved.

There really is a Naturalist Intelligence. I see it in my students and my friends! There is a bond that draws some to the outside to understand and enjoy the world that surrounds us. I have had little exposure to nature but that doesn't mean I can't learn when provided the opportunities. I don't have to be a science teacher to teach science. I don't need to be an expert. I just need to facilitate the learning process. The benefit for me is that I'm learning right along with the kids and developing my own intelligences.

Educational Implications for the Naturalist Intelligence

Developing the naturalist intelligence is no different than teaching math or reading skills. Teachers must provide the opportunity for this intelligence to grow.

We need to stop and consider the implications this identified intelligence has on our educational settings. Getting on a bus and moving to an appropriate expedition site extends learning beyond walking down the hall to the gym or the art room. Doing field studies extends experiential learning beyond working with pattern blocks in math class. By observing outside we can see those same patterns in nature and understand connections. Employable success in the future requires that our children be computer...
literate. We have stocked our classrooms and constructed computer labs to provide this opportunity. The quality of life on this planet requires that our children have experience with nature. We must provide the best educational learning opportunities for the Naturalist Intelligence.

All teachers are facing reforms that include state essential learnings and national standards. Naturalist topics and themes make some of the best curriculum integrations that will help us reach these goals. An example would be the themes of change, cycles, and connections. Topics that help enrich curriculum could revolve around the ecosystem where the school is located. Teachers in the Pacific Northwest could establish integrated studies around marine ecology, watersheds, forests, aquatic life. The instructors in the Southwest could focus on the desert environment. After all, intelligence has been defined as solving problems and fashioning products valued in one culture or community. Knowing and understanding your community environment and using it as an extended classroom just makes sense.

One simple way to encourage the Naturalist Intelligence is to take students outside to explore their school community. Careful observation will find weeds in the cracks of almost any playground surface. The eaves of a roof provide nesting places for birds. Water from storm runoff pours down storm drains in the parking lot. Data collected can be returned to the classroom and distributed in tables, charts and graphs. One trip outside can generate enough questions for inquiry that a school’s library and research lab could be utilized all year. These consistent short experiences outside on your school grounds provide a learning environment that will empower kids. Let them research solutions to problems they may identify.

Allow them to make a plan of action, design a project based on certain criteria and then implement it. Invite community resource professionals to support you. Celebrate with your entire school community when the problem is solved and the project is completed. Howard Garner defines understanding as the capacity to apply knowledge in new situations. Providing for the Naturalist Intelligence is one way to encourage true understanding.

A teacher’s primary responsibility is to be sure children experience success and learn. We must consider all children and provide the skills they need to grow. We must consider all ways to deliver curriculum. We must consider all intelligences when planning and organizing lessons. Tom Hoerr, Principal of New City School in St. Louis, states, “The Naturalist Intelligence offers one more way to help students understand and learn.”

Teaching to the Naturalist Intelligence

One of the lessons I have done with my students is called A Quick Quadrat. The goal of the lesson was to provide an experience to improve data collection and observation skills. A quadrat is a marked area that is a square. The quadrat on the school grounds can be designated by using a variety of materials such as yarn, string, or a wood frame. This lesson reinforces observation skills by getting the student to focus on one small area. That small area is then a

Naturalist Checklist

A child or adult who possesses the Naturalist Intelligence can be identified through observation. Usually a naturalist is a person who:

- is very comfortable in the out of doors.
- chooses to read books and watch programs about animals and ecosystems.
- nurtures living things (plants and animals).
- readily follows cyclic phenomena such as tides, seasons, phases of the moon, and climate.
- recognizes patterns, colors and classifications.
- automatically uses senses to explore environment.
- is a patient observer.
- feels a definite connection and relationship with nature.
- has an affinity for natural habitats such as oceans, forests, desert, wetlands.
- always wants to view and appreciate the aesthetics of nature.
- favors natural settings over the human influenced environment.
- is renewed by visiting natural settings.
- is constantly aware of their surroundings.
- will touch and explore “icky things.”
- enjoys collections of rocks, minerals, leaves, flowers, shells, feathers etc.
- seeks out music related to nature.
- would rather go to a zoo than an amusement park.
- sets up feeding stations for birds, small mammals and other wildlife.
- participates in volunteer projects that benefit plants, animals, watersheds or the earth.
- uses binoculars, telescopes, microscopes, and hand lenses when observing.
- receives satisfaction in learning names of flowers, trees, animals, rocks and minerals, cloud types, volcanoes, etc.
- collects articles, posters, pictures, figurines, stuffed animals related to wildlife or nature.
- grows plants (gardens, window boxes, indoor plants, herbs).
- photographs or sketches animals, plants, habitats (places).
- shares observations with others. (enjoys showing something like a flower blooming or small insect etc.)
- has a sense for detail and notices even the smallest of things.
- manipulates equipment to find out more about environmental water test kits, butterfly nets, plant presses, etc.
- works with natural materials for crafts and projects (ex. dried arrangements, plant presses, shells, and wood material).
- documents by sketching, photographing, or listing natural phenomena.
- pet stores are special places as are aquariums, wild life parks, zoos, farms etc.
- enjoys recreations such as hiking, fishing, mountain (rock) climbing, cross-country skiing, camping, sailing, scuba diving, etc.

representation of what lives in the larger area surrounding.

Before we left the classroom we cut a piece of yard int forty inch length and tied the ends together. The students practiced making a square on their desk top that had sides with a length of ten inches. I explained that this was called quadrat and it is used by scientists for data collection and observation of the area it surrounds. My sixth grade stude
Activity: A Quick Quadrat

Process Skills:
Observation, Data Collection, Predicting

Purpose:
Compare, order, and categorize scientific information
Learn that a quadrat is a method to study a small area in detail.

National Science Standards:
SA: ...Things can be sorted into groups in many different ways using various features to decide which things belong to which group.

Grade Level:
All (1-6)

Duration:
30-40 minutes

Materials:
Clip board
String
Pencil
Hand lens (optional)

Site:
School Grounds

Literature Entry Point:
One Small Square Woods by Donald Silver. ISBN 0-7167-6610-8
Beautifully illustrated. The focus is on small sections of the forest floor and canopy giving examples of what lives there.

Background:
A quadrat is a marked area that is a square. This lesson reinforces observation skills by getting the student to focus on one small area. That area can then be representative of what lives in a larger area.

Before you leave the classroom:
Cut yarn or string into a forty inch length. Practice making a square whose sides are ten inches long on the students' desktops. Explain this is a quadrat that makes a hundred square inch area. They are going to make a quadrat outside on the playground and record the things they see inside the square. Predict what kinds of things they will find inside.

In the field:
Guide the students to a spot on the playground where there are a variety of objects [not just nine million pieces of gravel]. Have them count and record what they see in the tally columns on the data sheet. If time allows have them try to draw and replicate the quadrat on the data sheet.

Return to the classroom:
Share results of quadrat in partners or with the whole group. Record the total classroom data of at least one object from everyone's square. Lead a discussion on the similarities or differences between and among objects observed. Check extension activities below.

Curriculum Extensions:
- Write sentences explaining what was tallied and illustrated in the quadrat.
- Make a pictograph of contents of quadrat.
- Make story problems about adding or subtracting objects from the square.
- Enlarge the quadrat using a larger scale.

Checking for Understanding:
- Demonstrate how to set up a quadrat. Duplicate in another area of the schoolyard.
- Using their quadrat data, have students make predictions about the kinds and numbers of common things found in the schoolyard.

Reflection Prompt:
- "Today I saw..."
- "I now know why..."
- "I feel..."
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then discussed area and perimeter from this construction. At this point, I had the class predict what kind of items they thought they would find in their quadrats when they constructed them outside on the playground. We brainstormed a list and recorded it on the classroom whiteboard for a comparison when they returned from outside.

In the field, I guided the students to a spot on the playground where I thought they would likely find a variety of natural objects. They then constructed their quadrats. If the quadrat was in dirt or grass they used pencils as posts to form their square around. On a data sheet they were to tall count and record what they saw. I also had them draw and try to replicate their observations from the quadrat.

When they returned to the classroom they shared the results of their data with partners and then with the whole group. We discussed several questions. What kind of items did they predict they would find outside correctly? What did they find in their quadrats that they hadn’t predicted would be there? Several interesting comments were made that reinforced the fact that some students saw connections. Several students were more interested in connecting the things in the quadrat and talking about why they appeared that space together.

I was strictly interested in collecting data and recording it. Looking for connections never occurred to me. After some exchanging of views we went on to record the total classroom data of at least one object from everyone’s quadrat. We discussed if they would feel comfortable making a prediction on how many of these objects could be found on the entire playground? They chose pinecones and were leery of making a prediction because they had no idea of how many square feet of playground space there was. A discussion on accurately mapping the playground followed.

There are lots of extensions for this lesson that teacher could chose at this point. The class could construct a pictograph of the data. In pairs they could write mathematical story problems using the data collected and try to stump others in their team. They could select one item from the quadrat and write a story of how it got on the playground. They could do research on an object discovered. They could recreate their quadrat for an art display.

I chose to have them reflect in their field studies journal about their experience outside by giving them several prompts:

Today we...
I saw...
One thing I thought was curious was...
I learned...
I think...

For the elementary teacher, teaching for the Naturalist Intelligence provides the key to integration. All levels of students need these types of experiences. Our generation grew up riding our bikes to the nearest park or vacant lot to play and explore. Children today are not permitted this freedom. They are more easily supervised and are safer at home in front of the TV.

Maggie Meyer facilitates the learning in a sixth grade classroom at Lakes Elementary in the North Thurston School District located in Lacey, WA. Along with fellow teachers Susan Wertz and Jenna Glock, she has co-authored a resource for teachers titled, Discovering the Naturalist Intelligence: Developing Science Skills Through Adventures in the Schoolyard. The book will be published by Zephyr Press in early Fall, 1998. Maggie is a facilitator for both GREEN and Project WET Workshops. She graduated from Eastern Washington State University and has a Master’s Degree from City University. You can reach Maggie at meymag@aol.com.