INTRODUCTION

I had heard “I have had it with those kids! They don’t want to learn!!” one time too many. My colleague was truly at her wits end with a group of Science 10 students who, for a variety of reasons, were unsuccessful in the course. I volunteered to take 9 of them and try teaching them using Dr. K. Egan’s Imaginative Education approach. The children were introduced to the idea in a meeting with their classroom teacher, the Principal and me. They were asked if they were interested in helping me develop a different way of teaching and learning for my studies and they all agreed. The children were curious about how this way of teaching and learning would be different from their regular class. I am grateful to these 9 courageous children because I learned as much from them as they learned from me.

How do we make meaning of Imaginative Education and ‘cognitive tools’? To try to explain this, picture yourself so small that you can ride on the back of a mitochondrion. Mitochondria? You know, those tiny, sausage-shaped organelles in every cell of everybody that are the ‘engines’ that drive the work of living systems, as they turn glucose into the energy that animates us. As you ride your mitochondrion, feel the surge of power under you as you float and vibrate in your cell. Billions of mitochondria do this work every second of every day in every life. This is what keeps us alive, and yet we are barely conscious of our mighty mitochondria.

I believe that ‘cognitive tools’ are really ‘learning engines’ that animate the way we understand the world. As we nurture these learning engines, they float and vibrate through our lives and drive our minds to acquire broader and broader understanding. These learning engines roam freely through our minds and come to the fore as we need them. Like mitochondria, they are always there working constantly, tirelessly, whether we are aware of them or not. This process is Imaginative Education.

The Science 10 unit was on Ecosystems and I decided to use the ‘learning engines’ that drive the need to understand the world in a Romantic way. I soon realized however that some of the children had great difficulty reading for themselves, especially reading silently. One of the changes I made right at the beginning of the Unit was to read aloud – sometimes I would read to them and sometimes they would read to each other, and that seemed to make a big difference.

PLANNING FOR ROMANTIC UNDERSTANDING

Using the Imaginative Education Research Group (I.E.R.G.) Romantic guide, the unit was conceptualized as a mechanism for developing the pupils’ use of Dr. Egan’s cognitive tools or ‘learning engines’. The lessons were then designed and implemented, with constant
monitoring of pupil confidence. The premise was that if pupils’ confidence increased then they would use their ‘learning engines’ as transferable abilities to other subject areas.

The following is the result of using the guide:

**Narrative:** How do Ecosystems teach us about our interconnectedness with Nature?

**Heroic Quality:** Interconnectedness; Sharing; Survival

**Humanizing of Meaning and Personification**

Biologists are curious about other species and how we are related to them. If we understand our place in nature, we will make better decisions about our actions as they affect all species, including ourselves. All species connect in ways that help us survive, and we can learn from other species how to survive without harming others.

**Revolt and Idealism**

The way we live now leaves little opportunity to interact with nature and understand our place in the world. Some ecological relationships, like mutualism, benefit both species; other relationships, like parasitism, means one species will benefit at the expense of another. Why does one live and one die?

**The Literate Eye and Graphic Organizers**

Graphing annual temperature and moisture variations visually distinguishes biomes as distinct climate regions and allows an understanding of patterns and trends in all 8 biomes.

**Collections and Sets**

This unit is understood through a unique vocabulary set that helps to define the key concepts. They are a treasure trove of meaning for untangling all the connections between species and biological events. A ‘treasure chest’ of vocabulary terms and meanings on unique flash cards help to frame this as a valuable resource. Having access to this ‘treasure’ unlocks the ideas related to the interconnectedness of species.

**Extremes and Limits**

Plants and animals offer many examples of the strange and bizarre. Some live in extreme climates and have adapted to their environment. These adaptations offer an access point for understanding how the different biomes support life.

**Change of Context and Role Play**
The lessons related to cycles offer an opportunity to adopt the role of an agent in the cycles and follow the transformations that agent goes through. The story “Jimmy saves the day” also has elements that would allow pupils to identify with the hero of the story, an unusual boy named Jimmy.

Backfilling the Somatic and Mythic Understanding

Three of the children in the group were diagnosed with specific learning challenges, three more were ESL and struggled with English and the remaining three had undetermined learning challenges. An attempt was made to use stories to engage the ‘learning engines’ of puzzles and mysteries, metaphor, jokes and humour, recognizing patterns and games. The children were intrigued by these and very soon were comfortable enough to move on to the more literate strategies to facilitate their understanding.

Here is a summary of the lessons:

Lesson 1: Introduction to the program. Awakening the Somatic – We took a nature walk in the school’s garden. Pupils were asked to use all their senses to observe. The only rule was no one could speak. Upon returning to the classroom, pupils do a drawing or written journal entry summarizing the experience. (See Vivian’s entry, Appendix 1)

Lesson 2: A Collection of Climatographs (See lesson notes, Appendix 2)

Lesson 3: Connecting with the World, Part 1 – Mysteries and Puzzles: I read them a passage from “Stones into Schools” p. 92, which described the struggle to provide schooling in remote parts of Afghanistan. Then, I introduced the practice of juggling. It is suggested that juggling helps people with ADHD to turn down the ‘volume’ on the many competing stimuli in their brain and to focus on one thing. Learning to juggle introduced the element of structured play into the pupil’s lives. It was also an opportunity to gain confidence, as they were far better at it than I was. We then devoted 20 minutes to unravelling the mystery of reading and constructing climatographs. (See Appendix 3)


Lesson 5: Extreme life (Extremes and Limits of Reality). Find the strangest/smallest/largest animal or plant in the books supplied. Play “Six degrees of Separation” – Find 6 ‘in-between’ ways that connect you to the animal or plant you chose. (See Appendix 4)

Lesson 6: Mutualism in Ecosystems. Read the story “Jimmy saves the day”. Ask pupils to write or draw a response. Activity: Stand on your less favoured leg. Time how long it takes you to lose your balance. With a partner, find a way to help each other stand for a longer time. Word meaning: commensalism, mutualism and parasitism. (See Appendix 5)

Lesson 7: Review for Chapter 1 test.
Lesson 8: Chapter 1 test. 4 out of 7 pupils passed! 2 received the highest mark they had ever received in school! 2 pupils did not write the test and never returned...😊

Lesson 9: Nutrient cycles. Did a vocabulary “treasure chest” collection.

Lesson 10: Nutrient Cycle – Eat a piece of food with your eyes closed. What does it taste like (salty, sweet, etc)? What plant or animal did its ingredients come from? Tell story of living thing with bizarre eating habits.

Lesson 11: Follow that Nutrient! Imagine you are a nutrient. What happens to you as you flow through the nutrient cycle? Start anywhere in the cycle.

Lesson 12: Carbon Cycle: What’s the story? Discover a weird fact/perception/sense of wonder about carbon-based life forms. Make a collage and include a carbon sink, carbon source and a release agent. (See Appendix 6)


Lesson 14: Review class. Take photographs. What techniques have you learned? Can you use them in any other class? (Only 2 pupils attended this class, as the others were involved in the ‘David Thompson Film Festival’ which showcases films made by our pupils.)

Lesson 15: Chapter 2 test. 6 pupils took the test with similar results to Chapter 1.

Appendix 1: Vivian’s nature-walk reflection in Lesson 1.
Appendix 2: Detailed Lesson 2 notes.

This is a sample lesson of instructions that would be left for a Teacher-on-Call. The teacher may or may not be familiar with Imaginative Education theory, but if the instructions are followed, then the desired result can be achieved through a well-planned lesson with the ‘learning engines’ embedded in the lessons.

Date: April 8, 2010

Class: Science 10 Imaginative Education Group (8 students)

Time: 12:30 – 1:45 pm

Room: 211 (Please pick up the students in Room 318 from Ms. Denchfield and take them to 211. Ms. Jack will open the room for you)

This group is working on turning a deeper understanding of the Ecology unit into more written output. They need to build their confidence and recognize what they are able to do.

Please give them the “Do you remember...” sheet. They may write or draw to answer the questions. Give them about 10 minutes to do it.

Give them their folder to do the following assignment on identifying biomes.

Then read the following with them:

“You are world-famous climatologists. Some new environments have been discovered on a nearby planet and you have been asked to determine if they are similar enough to the Earth’s biomes for humans to live there.

1. Examine your photograph and decide which of Earth’s biome it is most like.
2. List the features in each photograph that helped you make your decision.”

No matter what they write ask them to take a longer look at the photograph for anything they may have missed the first time. I’ll mark these when I get back.

ANSWERS (just for you):

1. Tropical rainforest (West Indies – the animal is a manatee.)
2. Desert (Northern Iran)
3. Permanent Ice (Arctic)
4. Tundra (Alaska)
5. Temperate rainforest (BC)
6. Grassland (South Africa)

7. Boreal forest (Siberia)
8. Temperate deciduous forest (California)
Climatographs:

Read the instruction with them.

“A climatograph shows how temperature and moisture vary throughout the year. It can be used to identify biomes. You must convince the government that the climate on the nearby planet can sustain life. To do this you must use the data on page 31 to create a climatograph and analyze the type of climate it represents. Perhaps they will name the planet after you if you do a good job with this.”

Let them follow the graph on page 30 if they are unsure of what to do.

Please collect their folders as well as the graphs. If there is time have them write me a short message about how they felt, what they learned and how they can use what they learned.

Thank you so much!

Judy

NAME: ____________________________________________

Date: _____________________________________________

DO YOU REMEMBER....?

1. Record in words or diagram everything you remember about
   (a) Biomes
   (b) Ecosystems
   (c) Habitats
2. What 2 abiotic (non-living) factors affect biomes?
3. Name 2 biomes that have opposite characteristics.

Appendix 3: Analyzing

Name: ________________________ Date: ____________________

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Analyze

1. For the climatograph:
   a. Which month has the lowest average temperature?

b. What was the average temperature for the month of September?

c. Which month was the wettest?

2. Assume that a growing season must have average temperatures above +5°C. How many months of the year can plants grow in this location?

3. This climatograph is from data relating to a city in Alberta. Examine the data and determine which biome is represented.
4. Suppose each month's average temperature increased by 4°C. How long would the growing season be under these conditions?

Appendix 4: This is a sample of a pupil’s connection to a bear from the Boreal Forest Biome. His degree of separation was one!

April 16, 2010 Lesson 5

Strangest, biggest, smallest

1. 5 minute reading from “Everything I need to know I learned in kindergarten”.
2. Individual study: From the books provided (10 library books) choose the strangest, biggest, smallest animal or plant that interests you and write down any information you can find about it.
3. “Six degrees of separation” – How is the living thing you chose connected to you? Make a web or chart or diagram to show how the two of you are connected.

Reflection: Executive function skills (memory, attention, sensory-motor skills) - place yourself on the continuum from 1 – 5 on each of the skills.
Appendix 5: “Jimmy saves the day!”

Jimmy was a talented boy who was curious about everything around him. He had special gifts that everyone admired. He was funny, he was kind, he could juggle and his most special gift was that he could see things from an odd angle in a way that nobody else could see. It was Jimmy’s superpower.

But when Jimmy went to school, none of his special gifts and superpower seemed to matter. All the adults at school seemed to care about one thing only – reading! Now, don’t get
me wrong, Jimmy could read. He had spent a lot of time learning his letters, spelling words and learning to say the words out loud. He knew how to do that. But at school everyone did this strange thing called “silent reading”. He vaguely remembered his teacher telling him that this only became popular in the 1400’s. In silent reading, people would say the words only to themselves, inside their head! What was up with that?!

This is when Jimmy started to fade away. When he said the words to himself, they became all jumbled and he couldn’t imagine what the words were trying to tell him. It was as if the words were talking in some strange language that he had never heard before. Worse yet, everybody else seemed to know what the words were saying. They would sit for a few minutes staring at the page and then suddenly start to giggle. It was as if everybody else was sharing some delicious secret and poor Jimmy was being left out. It was as if he was engulfed in foggy valley and everyone else was seeing the view from the mountain top.

Jimmy started feeling uncomfortable and then he got mad! If everyone else was going to exclude him like this, then he was going to exclude them right back! Why should he try to belong to a group that didn’t care about his special gifts and superpower? He decided to pretend that he knew what the words were saying too so that everyone would just leave him alone.

What Jimmy didn’t realize was that while he was seeing the words as symbols on a page, other people were seeing a picture in their mind, when they read! Then one day Jimmy started imagining things like a special movie in his head too. Suddenly the fog lifted and he could now see the mountain top. He started to climb.

Jimmy was determined and soon he could see those pictures in his head all the time; but, in addition, he had the advantage of having his very own superpower – he could see things from an odd angle in a way that nobody else could see. Half way up the mountain, Jimmy met some villagers, frantically reading about honeybees. They were searching for the answer to a very pressing problem. Their vegetable gardens were dying without producing any vegetables. They had also noticed a decline in the number of honeybees visiting their vegetables gardens.

Was there a connection between the honeybees and their gardens? If so, is the honeybee our friend or foe?

Why weren’t the honeybees coming to the mountain anymore? Were they drinking margaritas on a beach in Mexico and having such a good time that they couldn’t be bothered to come to the mountain? What could Jimmy do to encourage the honeybees to come back to the vegetable gardens? Is there another solution to the problem? Could Jimmy save the day?

How does the story end? I don’t know – you tell me...

Kline’s reflection on this story is a indication that he identified strongly with Jimmy.
Appendix 6: Cycles and how we fit into them.
Conclusion

This unit was designed at a time when I was just beginning my learning process regarding Dr. Egan’s Theory of Understanding. As a result, the unit may contain flaws of omission and misunderstanding. However, as teachers, we are often required to step into a crisis situation and ‘make stuff up as we go along’. I submit this unit as an example of this ‘flying by the seat of one’s pants’ genre of unit planning. I tried my best to put the theory into practice, with the view that if I waited until I had perfected this, the moment would have passed for these pupils and an opportunity to give them meaningful life strategies would have been lost. In this case, I acted on the belief that this embryonic unit was better than nothing at all.

In my defence, the pupils all reported loving the 15 lessons and did not want to return to the regular class. We maintained a relationship, as they continued to talk to me when we passed each other in the halls. I take comfort in the fact that they did not run in the opposite direction when they saw me and interpret that as a sign that I did not waste their time and did not scar them for life. Sometimes, that is the best we can do.