Innovations in Thinking and Learning
Jennifer Cooper – Combining Pedagogies for Deep Learning

JENNIFER: We were looking at human impact on the environment, which is one of the Grade 8 geography topics, and sustainability, which is one of the Grade 7 geography topics. And I also wanted to connect it to literacy. So I started by showing them a documentary called "Revolution," made by Rob Stewart, who is very passionate about the environment. Particularly the oceans, which is a passion of mine as a scuba diver. So I thought, "I'll show the kids this and see if they latch on."

So the documentary touched on four main aspects: ocean acidification, deforestation, shark finning, and climate change. So once the students had viewed the documentary, I asked them to talk about their questions and what they were most interested in.

My next question was, What do students want to know more about? So I gave them a RAN chart, where they write down what they think they know about a topic, questions they have, and there are some spaces that can be revisited later as they build their knowledge on that topic. So students chose one of the four -- ocean acidification, deforestation, climate change, shark finning, and asked their questions. And gave me a sense, almost as a diagnostic tool. I had them hand it in. I could see what they thought they knew and where their interests lay for us to proceed to the next step.

Next, we went into some knowledge-building. Knowledge-building is something we do often as a class, but we've always done it as a whole class. And this time we tried it in smaller groups. So I broke the students off into groups based on where they said their highest area of interest lied. And they met in groups and began asking questions about their topic. So the deforestation group, for example, asked things like, what were the various purposes that people cut down trees for. What are the regulations in various countries about cutting down trees? What would happen if there was a total ban on cutting down trees? And from there, groups used various technology. They used iPads, they used laptops. Some people contacted experts in the field, some of them were Tweeting at the creator of the documentary, asking their questions to continually build their knowledge and improve on their ideas in these topics. And within their groups they were also looking for connections between the various things that they had learned.

After the students built their knowledge on their specific topic in their small groups, we met as a large group. So when we do a knowledge-building circle, we move the furniture, we all sit around the room so that we're facing each other, and students were invited to share. So each group shared what they had learned about their topic, and the class was able -- the rest of the class was able to ask questions about their topic to help
further their learning. And in terms of assessment, I constantly have my laptop on the go, making notes about their oral communication skills, who is sharing, what kinds of questions people are asking, even their non-verbal. So, Are they looking at the person that's speaking? So I just have a chart on the go with all of their names and make notes about their contributions during the knowledge-building circle.

So from that point, each group was given their opportunity to share. We made some connections between the topics using the overall lens of sustainability and human impact on the environment. And I was able to ask the students, "Now what do we want to know?"

Next, we moved to a tool called causal modelling, which we have used in class before. And when -- Causal modelling basically takes an effect -- so something simple like traffic -- and asks the question, "What causes that to happen?" And it breaks -- And then for -- at each level of a causal model, students keep asking, "What causes that?" and "What causes that?" So when I introduce the tool, a key thing for me is introducing it in a familiar context first. So I didn't ask the question right away: what causes ocean acidification? I asked them to pick a topic they were familiar with. So I modelled with, What causes traffic? And they said things like construction, accidents. And then we build the next level. "Okay, well what causes construction?" Well, road conditions, roads deteriorating over time. "What causes that?" And we keep building the various levels.

So I told them, "Now you know a lot about these topics; you've done research, you've asked great questions. Now we're going to dig deeper and think about what caused each of these problems to happen." So we're going to ask what caused ocean acidification, what caused shark finning. And the nice thing is there's no wrong answers. It's just their thinking. And it gives them a chance to be creative and come up with some different ideas. So students also used their knowledge-building and what they had learned to help them create those causal models.

Then they completely derailed me. I left an article one day when I knew I had to be away about plastic micro-beads in personal care products. And it was a recent article that had come out that day about the Ottawa government potentially banning those little plastic beads from being in facial scrubs and body washes because they are so small that they go down the drain, they end up in oceans and lakes and rivers, and are a detriment to our environment. Fish eat them, we end up ingesting them when we eat the fish. And I thought this would be a one-day thing. I thought, "It's connected to what we're talking about." And the kids were completely hooked on this. I came back the next day and they were so excited to ask me all about plastic micro-beads. "Can we look at products under microscopes and see these microbeads?" "Can we learn more about
this?" "What can we do to help? This is a problem." And I had a decision to make. And this was big for me as an educator because I had a plan. I knew where we were supposed to go next, I knew what we were going to be doing, and now all of a sudden they've latched onto this topic that is related to what we were talking about, but still something new. So I gave them the choice. And with our next activity I said, "You can continue learning about your original topic you picked, or you can start learning about micro-beads." And I knew I made the right decision when 26 out of 28 kids decided to pursue their knowledge of microbeads.

Our next step was to introduce another tool of integrative thinking called opposable models, where students look at two opposite viewpoints. So again we introduced it in a familiar context first. Things like school uniforms versus no dress code. No homework versus homework every night. And the idea is that students first determine what that model looks like. So what does a school with uniforms look like? What does a school with no dress code look like? And their goal is just to define a model of what that looks like, trying to keep their emotions out of it. Which is very hard for them, especially with a topic like uniforms where they're very personally attached to the topic.

From that point we then went back to their sustainability topics and used the opposable model once they had practiced in a familiar context. And most groups chose plastic microbeads banned versus plastic microbeads allowed in products. And again, most students -- now that they had decided that these plastic beads were such a horrible thing, had a hard time identifying something positive about that. And it was really interesting to watch them challenge each other and challenge their thinking, and have -- and sit there thinking, "Well, I don't know what I like about this." And having to come up with something. And then eventually coming up with solutions based on the benefits that they had identified.

After that, we had a final knowledge-building circle and I asked the question, "Now what are we going to do?" We know all about the -- how humans impact the environment, we know about sustainability. How are we going to share that knowledge with others? And we talk a lot about having purpose behind the tasks that we do. How can you share your knowledge? So we talked about authentic audiences and ways that they can share what they've learned. And some examples that they came up with were, "I could write a children's book, educating younger students about how they impact the environment and how they can help." "I could design a website to educate others." "I could design a storyboard for a new segment that could air on CHCH." "I could create a magazine that could be distributed."
Something that I am working on as a teacher is pulling in more outside connections. So with these projects, I encourage students not only to turn to the internet for research, but to find an expert that they can speak to. So one group contacted Lush and asked about natural exfoliants. One group contacted an engineer and asked about building a filter, and things they should consider. We also had a guest speaker come into the class that is doing PhD research on water crisis in first nation communities. And talked to the students about that. And we made connections between what they had learned about water conservation to what she had learned in her research.

Once students started working on their tasks, they knew they had to define their topic. They had to explain how humans impact the environment, they had to explain how people can help, and what will happen in the future if a change isn't made. And from there, as a class, we built success criteria. So I asked them, "No matter what your project was -- if it was a magazine or a website -- what should everyone have that will make their project successful?" And they came up with things like, "I explained what the problem is." "I explained how people can help." "I've made connections." And then from there, I also gave them some blank space on their success criteria to add some criteria that was specific to their personal project.

I think it's important with a task like this and a topic like this to help build their empathy. To help them understand that the world that they live in isn't the world that everyone else necessarily lives in.