MODULE 4

WHAT GOES AROUND COMES AROUND
AGRICULTURE RECYCLING
K - 6

DESCRIPTION
Recycling happens not only in our homes, but also on farms. Atlantic Canadians have innovative ideas when it comes to recycling.

OBJECTIVES
• to identify objects that can be recycled.
• to increase awareness of agriculture recycling initiatives.

CURRICULUM CONNECTIONS
Science
Music/Drama
Language Arts
Social Studies
Opening

Atlantic Canada is doing some exciting things in the recycling of agricultural products. As we know, everyone has to be conscious of the way we dispose of waste. Some businesses in this region are being creative and turning other’s waste into someone else’s treasure. This section profiles different businesses that are doing just that. These are only a sample of some of the unique initiatives that are going on all around you.

1. **K - 3:** As a class, develop a definition for waste. Come up with a list of products that students consider waste. How do we combat waste? What is recycling? What “wastes” are currently recycled in this region.

2. **Grades 4 - 6:** As a class, develop a list of products that are currently recycled in this region. What products are made from the recycled things?

3. Read the profiles on agricultural recycling initiatives in the Atlantic provinces.

4. Discuss how these initiatives will help the environment, if at all. What do the students think of these ideas?

5. **Grade 6:** What kind of microorganisms are involved in Waste Not Want Not? How do they meet their needs (obtain food, water, air and moving around.)
DEVELOPING THE CONCEPT

4. **K - 3**: Waste Walk

OPTION A: Take students on a waste walk. Have them identify pieces of garbage and decided if they could be recycled and how. A school grounds clean-up could be incorporated into this exercise.

OPTION B: If you are unable to go outside for a walk - do a “pretend waste walk” using the picnic memory game (example: I’m going on a waste walk and I found a juice can. The next person comes up with their own idea and then repeats the one(s) before). Upon completion of the game discuss ways of recycling things that they found.

5. **Grades 4 - 6**: Using the book *50 Simple Things Kids Can Do to Save the Earth*, Javana, John. Earthworks Group, 1990, complete the following activities.

A. Ask students to complete one of the 50 projects. Ask them to create a plan to implement this project and to report the progress or results, using page 42.

B. Have students bring old, white or light coloured t-shirts to class. Use fabric crayons to design t-shirts that feature recycling and environmental messages.

C. Write letters to local businesses, farmers, etc.. In the letters, ask these people if they are recycling, what ways they are recycling or if they are not recycling, why not?
6. **Grades 3 - 6:**
Tell the students that they are Atlantic Business people interested in environmental issues. In groups, have them choose an “old” product that they would like to recycle. What new product(s) could be made from the old one? Construct samples of the new ones and explain how they can be used. (An example would be changing plastic bags into plastic lumber).

7. **K - 3:** Opinion Poll: As a class discuss the following scenarios and ask students their opinions on what they would do.

   a. You are walking down the street eating a chocolate bar. The wrapper is messy and you want to get rid of it. There are no garbage cans around, but you can’t put the wrapper in your pocket. Also, you don’t want your mom/dad to know that you had the bar. What do you do?

   b. Your family empties four 2-litre milk containers each week. What do you do with these?

   c. A small restaurant empties 30 2-litre soft drink containers each week. The closest recycling depot is a thirty minute drive from the restaurant. What do you suggest they do with the containers?

6. **K - 3:** In groups of two, have the students play Recycling Word Tennis. The words are the ball. One person starts and they “hit” words back and forth until one player cannot think of a word. All words must pertain to recycling in agriculture and they cannot be repeated. Each player only has 3-5 seconds to return the ball.
CLOSING

K - 3: Develop skits, songs or commercials about recycling. Encourage children to be creative. For extra fun, video tape the presentations and watch them afterwards as a class.

Grades 4 - 6: As a class, develop an “ABC Big Book” on recycling in agriculture. Read examples of big books to students. Have students select a letter to research for the book and brainstorm topics to write about. Make sure that they illustrate their write-up. Each student should be responsible for the layout of his/her page. The page should include a large letter, write up and illustration. Share your books with a younger class or place in the library at the school.

Note: if you have more than 26 students in your class, have the others work on the front and back cover.
Mattresses for Cows???

Imagine that you are a cow. You are a bit tired and have decided to take a nap. You walk over to your stall and lay down. Instead of there being a hard cement floor covered with sawdust, you are excited when you lay on something softer. After some investigation, you see that the farmer who looks after you has given you a mattress to lie on instead of the hard floor. It is cozy and warm and you fall asleep right away.

That might sound like a funny thing – a mattress for a cow, but in Clementsport, Nova Scotia, there is a company, TRACC Inc., that makes cow mattresses. Just off of the main road in Clementsport, there is a big blue building with thousands of old tires piled out front.

Every time someone decides to put new tires on their vehicle something has to be done with the old ones. In the summer of 1997, TRACC Inc. developed a way to make something new out of something old.

What do they do with the tires?

As they are, old tires are not of much use to anyone. They have to be broken down into smaller pieces. The tires are put through a number of machines where they are continually chopped smaller and smaller. The small pieces of tire pass over a magnet that picks up any pieces of metal (nails or metal shavings) that might be in the tires. Next, the pieces are sorted into different bags according to size. Depending on how big they are, the pieces of ground-up tire will be used to make a different product.
What can be made with old tires?
These particular tires are being turned into a few different products. After the tires are chopped into very fine pieces they can be used to make scallop rings (used in dragging for scallops), solid rubber cow mats (two sizes, 1.3 cm and 1.9 cm thick) and cow mattresses.

There are only four companies in the world that are making cow mattresses at this time and one of these is located in Nova Scotia. Each company makes them a little differently, but they are all used for the same purpose. The cow mattresses made in Nova Scotia resemble an air mattress, except that they are filled with rubber tire pieces instead of air.

Why do cows need mattresses?
Dairy cows are raised for their milk. Milk comes from the cow’s udder. It is important to keep the udder clean and protected so that cows can give milk every day. Farmers like Pam and Andy Bishop are trying out the cow mattresses to try to help their cows be more comfortable. The Bishops, along with their son Geoff, operate a dairy farm outside Annapolis Royal, Nova Scotia. Recently, they put cow mattresses in their barns. They are hoping that with the use of the mattresses, their cows will have a cleaner, healthier living environment.

The Future?
How long the mattresses will last and how much they will benefit cows is still to be determined. Because this is new, the results will not be seen for a number of years to come.

Pretend that you are a cow again. You are lying down on your mattress, chewing your cud, ready to go to sleep. It feels wonderful to be so comfortable. You say MOOOOo000 to thank your farmer for giving you the mattress.
Problems with Plastic?

Everywhere you look there is plastic. Plastic shopping bags, wrappers, frozen food bags and the list goes on. Farmers have lots of plastic too. Have you ever driven past a field and seen things that look like big white or black marshmallows? Or maybe you have seen the long tubes of white or black plastic near a farmer’s barn. Both of these are filled with silage. Silage is a type of forage fed to cows. After the silage bales are opened, the plastic wrapper is left and cannot be used again. That means that each year, farmers are left with big piles of plastic that cannot be reused.

What are the options?
Farmers in this region didn’t have very many ways to get rid of silage wrap. Many were burning it; however, silage wrap contains toxins which are harmful to the environment when burned. Other farmers were burying it, but plastic will not break down for a long time, so this wasn’t a very good option. Some farmers were delivering their plastic to landfill sites. In the landfill, the plastic was taking up too much room so very often it was sent to a local burn station.

An idea?
Finally, Austin Boyd, who lives on Prince Edward Island, developed a way to recycle the plastic silage wrap. He saw that Island farmers had an environmental problem in getting rid of the silage wrap and decided that he could develop a way to help. In January of 1998, Mr. Boyd started research on how to turn the silage wrap that no one needed into something that could be used again. He was successful in developing PLAS-TEK.
What is PLAS-TEK?
PLAS-TEK is plastic lumber. Austin Boyd makes this lumber in all sorts of different sizes just like wooden lumber. This plastic lumber is guaranteed for life against rot and can be used to make lots of different things. On Prince Edward Island, people are using this plastic lumber to make fences, patios, compost bins, playground equipment, picnic tables, lobster traps and all sorts of other things.

What is the future for PLAS-TEK?
Mr. Boyd is excited about the future of this product. The more people hear about its uses, the more people want it. Due to the fact that it won’t rot and that it can be used just like wood, (cutting and nailing), it is becoming popular for home owners. Who knows? Maybe your next set of steps or deck might be made with PLAS-TEK!
Waste Not, Want Not

What if there was a farm that had no waste leaving it? There is such a place and it is located in Keswick Ridge, New Brunswick, just outside Fredericton. This farm has chickens, apples and green peppers. Where does all of the manure go? What about the bad apples or green peppers?

The Setup
This farm belongs to David Coburn. David runs a closed loop farm. That means that no waste ever leaves his farm. An example of a closed loop system could be: chickens make manure, the manure is composted, that compost is then spread on grain fields. The grain is then used to feed the chickens. The nutrients from the manure are in a constant cycle or loop and are never wasted.

How Does It Work?
In 1993, Mr. Coburn built an indoor composting facility. He composes all organic wastes produced on his farm which consist of manure, apple pomace (waste from making apple cider) and green peppers not suitable for human use. These wastes are blended with straw and sawdust. This combination spends 6 weeks (42 days) in a primary composter. During the time in the primary composter, the compost pile must reach a temperature of over 54.5°C for three days to kill any weed seeds in the compost. Next, the pile must reach a temperature over 65.5°C for another three days, to kill any pathogens (bacteria) that might be present in the compost. The product is then weed and pathogen free.
The next step is to screen the compost. About 3% of the total pile is taken out for mulching purposes. The other 97% goes to another building where it is cured for a minimum of twelve weeks.

What is done with it?
After this long process, the compost is finished. What comes out of the second barn is dry material (contains only 20-25% moisture) with no odour, that has been processed and value added. This compost then has three options: it can be used on the Coburn farm as fertilizer, sold in bulk to home garden growers or bagged and sold at local garden centres.

Biotechnology
A bit of biotechnology is used in this process. Mr. Coburn feeds an extract of the yucca plant to his chickens. This plant grows in areas that do not receive very much moisture (desert areas). The yucca plant has a natural ability to tie up the nitrogen in the manure and release it later. This is great because the yucca plant dries the manure causing a decrease in odour so that even when spreading, the well-known odour of manure does not linger in the air.

How Important Is This Business?
Each year, Environment Canada gives a “Canadian Healthy Environmental Award” to one corporate business in Canada. Recently, David Coburn’s farm was nominated due to this composting initiative. Mr. Coburn’s farm reached the finals and received the distinction of being the first farm to ever make it to the finals for this award. The farm was awarded the first runner up prize for their efforts of trying to preserve the environment.