



## ***Energy Detectives Facilitator Notes***

### **Objective:**

- Students will be able to name the energy inputs throughout the food system and find ways to reduce their impact through changing habits and choices.
- Students will be able to experience, first-hand, the ways in which energy conservation can be put into practice both when shopping for food also preparing food.



**Recipe Category:** Food: "Outside the Box"



**Cooking Time:** 30 minutes



**Level of Difficulty:** Grade 6



### **Recipe Ingredients:**

- Map puzzle (or a large world map)
- Apple with NZ "sticker", found: [www.buynz.org.nz](http://www.buynz.org.nz)
- Apple with Foodland Ontario "sticker", found: [www.foodland.gov.on.ca](http://www.foodland.gov.on.ca)
- 10 Story cards (attached)

### **Story Props**

- |  |  |
|--|--|
| <input type="checkbox"/> 30 small apples<br>("energy units") | <input type="checkbox"/> Ship costume    |
| <input type="checkbox"/> Farmer hat                          | <input type="checkbox"/> Plane costume   |
| <input type="checkbox"/> Spray bottle                        | <input type="checkbox"/> Truck costume   |
| <input type="checkbox"/> A shaker                            | <input type="checkbox"/> Shopping basket |
| <input type="checkbox"/> Sunglasses                          | <input type="checkbox"/> Steering wheel  |
|  | <input type="checkbox"/> Trucking Cap    |





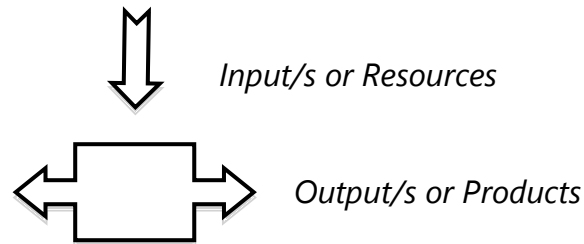
## Curriculum Links:

Grade	Subject	Ontario Curriculum Links
6	Science & Technology	<p><i>Energy and Control - Electricity</i></p> <p>Identify uses of electrical energy in the home and community and evaluate the impact of these uses on both our quality of life and the environment.</p> <ul style="list-style-type: none"> <li>• Develop a plan for reducing electricity consumption at home or at school, and assess how this change could affect the economy (e.g., jobs) and our use of natural resources.</li> </ul>
	Social Studies	<p><i>Canada's Links to the World</i></p> <p>Use a variety of resources and tools to gather, process and communicate information about the domestic and international effects of Canada's links with the US and other areas of the world. (O)</p> <ul style="list-style-type: none"> <li>• Use a variety of primary and secondary sources to locate and process relevant information about Canada's links with the world (e.g., primary sources: statistics, field trips, interviews, original documents; secondary sources: maps, illustrations, print materials, videos, CD-ROMs, Internet sites)</li> <li>• Analyse, classify, and interpret information about the United States and at least one other country from another region of the world</li> <li>• Use and construct a variety of graphic organizers and graphs to sort, classify, connect, and interpret information (e.g., tables to show countries and total trade; double bar graphs to compare imports to exports; circle graphs to show how tourist dollars are spent)</li> </ul>

## Energy Introduction (5mins)

It takes lots of energy to provide the things we use in our everyday lives (food, cars, houses, clothes, computers) – when we talk about *energy* use, we usually refer to energy **inputs or resources**, and **outputs or products**

**\*\*Use students to show this input/output diagram dramatically:**



**Energy** is basically the fuel needed to create a product or make something happen (move, change, grow...), and is usually measured by “calories” (e.g. just like temperature is measured in degrees, or length in metres).

**\*\*Take two volunteers. Ask one to do jumping jacks and one to sway from side to side – which one is using more energy? What are the inputs?**

Today’s celebration is all about food. So how does this energy concept **relate back to food?**

- *Food is another kind of energy used to fuel people and animals.*
- *We need energy to make and grow food.*
- *There are many different energy “inputs” that are needed to create the end product – food for us, ready to eat, packaged, frozen....etc*
- *This whole process, plus all the people or animals involved is a **food system**.*

## Energy Detectives: (25mins)

Let's talk about apples... Not only the different **inputs** that help apples on their journey from Field to Table.... But also the **energy** used to get them to us!

### Mapping it out – Local vs. Imported:

Even though we grow lots of apples locally in Ontario, Canada still imports over 72 tonnes of apples each year, that's about as much as a Bowhead Whale weighs!

(2006 data: <http://www.omafra.gov.on.ca/english/stats/hort/glance/table10.htm>)

- Have one student read the origin sticker on the apple from far away, in New Zealand.
- The class helps you find it on the world map puzzle
- One student reads the *FoodLand Ontario* sticker on the apple which means it's grown locally, for example, in Simcoe (within Ontario).
- Place one apple on Simcoe (Ontario), and one apple on New Zealand, with a central apple on Toronto (us).
- Use a ruler or other object to measure the distance from Toronto to the Greenbelt and NZ. As a scale, Canada is around 3,000km wide.

"Stickers":



### Progressive Story – Following the Journey of the Apple

- Hand out the ten story cards to ten students that will be the actors
- Let actors find their "prop" that helps them get into character
- Have students read their card in the numbered order

- Those students without an acting role can help by putting down the number of “energy blocks” (apples) onto the map, making a path between NZ and Canada.
- Act out or read the conventionally grown NZ apple story. Ask students to stand in a line once they’ve said their part of the story.

## Conventionally Grown Apple from New Zealand

### **1. I'm an Industrial Farmer...**

I own a large industrial farm far, far away in New Zealand. In order to grow enough apples to send to the processing factory and make enough money, I need to plant at least 50 000 trees! I need lots of help from tractors and large machinery to make that happen, not to mention chemicals. Pesticide helps keep the pests away and fertilizer helps them to grow much faster, so I depend on them quite a bit.

#### **COUNT 3 ENERGY "UNITS"**

*1 for pesticide, 1 for fertilizer, 1 for the use of machinery powered by fuel*

\* Optional Prop – Farmer's hat

### **2. I'm an Industrial Farm Helper...**

I come onto the farm to water and continue the spray of pesticides on the thousands of apple trees. I do this using machines that spray all over the place. This type of farm has just one crop, apples. This is called a "Mono-Crop". The down side of monocrops is that there will be lots of nasty pests to deal with – they just love monocrops because they are easier to manage. I also rely heavily on pesticides and fertilizers, made from fossil fuels.

#### **COUNT 3 ENERGY "UNITS"**

*1 for pesticide, 1 for fertilizer, 1 for the use of machinery powered by fuel*

\*Optional Prop – Spray Bottle

### **3. I'm a Machine Harvester...**

Industrial farmers need me in the fall, when the apples are ready for the picking. There are almost a million apples on the trees and the farmer needs to pick them really fast, so they use me to shake them right out of the tree! A "Tree Shaker" is used to make the apples fall to the ground. Then another machine is used to collect them once they have fallen.

**COUNT 4 ENERGY "UNITS"**

*2 for the fuel used to power the Shaker and 2 for the fuel used to power the Collector*

\*Optional Prop – A Shaker

#### 4. I'm a Machine Sorter...

After harvesting so many apples, the farmer needs help to sort them all into equal sized boxes. I can use my laser vision to sort the apples according to their size, weight, colour, the quality of their skin and even by what's on the *inside*!

#### **COUNT 2 ENERGY "UNITS"**

*2 for the fuel used to power the sorter*

\*Optional Prop – Sunglasses

#### 5. I'm a Big Ship...

All the sorted apples are packed onto me and exported from New Zealand. I transport the apples all the way to Vancouver B.C., where they're stored for a while. Note that this is a very long distance and a very big ship.

#### **COUNT 5 ENERGY "UNITS"**

*5 for the fuel guzzled during the trip from New Zealand to Canada*

\*Optional Prop – Ship costume

#### 6. I'm a Plane...

I pick the apples up from Vancouver B.C. and fly them all the way across the country to Toronto, Ontario. Yeah, yeah I know I use loads of energy, but I can carry LOTS of apples.

#### **COUNT 6 ENERGY "UNITS"**

*6 for the fuel used by the plane to get from Vancouver to Toronto*

\*Optional Prop – Plane costume



### **7. I'm the Transport Truck ...**

Okay, so now the apples are in the city. But they need to be taken to the Ontario Food Terminal, where they are separated, ready for pick-up by lots of different stores, organizations and supermarkets wanting to sell apples. That's my job!

#### **COUNT 2 ENERGY "UNITS"**

*2 for the fuel used by the truck to get form the train terminal to the food terminal*

\*Optional Prop – Truck costume

### **8. I'm the *Second* Transport Truck ...**

The Supermarket sends me to collect all of the different fruits and vegetables, including the apples, from the Food Terminal. I can then bring them back to the supermarket so that people can come and buy them.

#### **COUNT 2 ENERGY "UNITS"**

*2 for the fuel used by the truck to get form the food terminal to the supermarket*

\*Optional Prop – Trucker Cap

### **9. I'm the Supermarket...**

The apples arrive at the supermarket in downtown Toronto. It is a big box store that is open 24 hours a day, is well lit, air conditioned, has several large freezers and refrigerators, and cash registers and credit card machines working around the clock.

#### **COUNT 2 ENERGY "UNITS"**

*1 for the lights and the air conditioning, 1 for the refrigeration and the machines*

\*Optional Prop – Shopping basket

## 10. I'm your Car...

The apples are waiting and ready in the supermarket to be purchased. You drive your car to the store and buy the apple before driving home.

### COUNT 1 ENERGY "BLOCK"

1 for the fuel needed to power the car

\*Optional Prop – Steering wheel

### Discussion:

Ask student actors to continue standing in a line for discussion.

- How many energy units are there all together?
  - 30
- Does this seem like a little or a lot?
  - A lot!
- What could we do to reduce the number of energy units?
  - Use less chemicals and pesticides
  - Use your body instead of machines to water, harvest and sort
  - Use machines that are powered by the body (e.g. hand-held fruit picker)
  - Eat apples that are grown more locally (e.g. Ontario, Niagara) which needs less transport
  - Ride or walk to the supermarket
  - Shop at the farmers market (less energy used)

Take away appropriate number of energy units as each is suggested.