Follow the Food! Exploring Food Loss + Food Waste

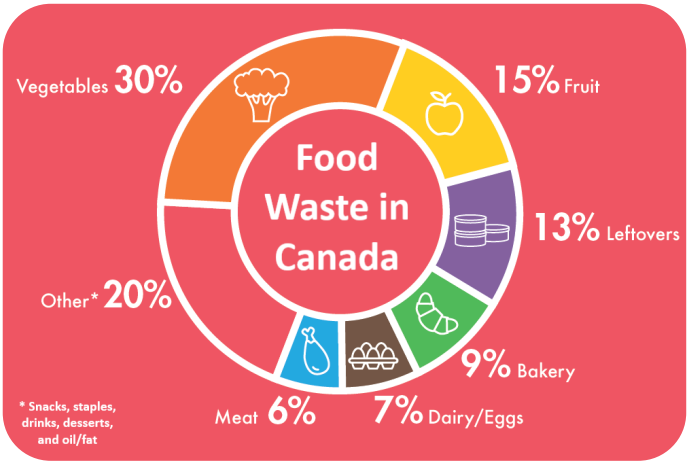
Suivez les aliments! Explorer les pertes alimentaires et le gaspillage alimentaire

TEACHER GUIDE (Gr 2-4)

Food is wasted and lost every day, around the world, but do we understand the impact of that on food security, the economy, and the environment? **Follow the Food – Exploring Food Loss and Food Waste** is a hands-on, inquiry-based resource to help students gain a better appreciation as to the value of food, the resources that go into making it, how the agriculture and food industry in MB reduces food loss and waste and the role school and students can play in reducing food waste.

There are 2 main activities included in this resource, plus, extension activities and projects that can be used as application and/or for assessment.

Activity 1: Follow the Food
Activity 2: Balloons Go Bananas!



Source: National Zero Waste Council. 2022

BACKGROUND INFORMATION:

What is the difference between food loss and food waste? *Food loss* refers to food that is produced on the farm but is damaged or destroyed before it gets to stores, restaurants, or homes. This is more common in low-income countries, where infrastructure, innovative research, government support, and access to finance is often limited. *Food waste* happens when food that is in stores, restaurants and homes is thrown out. This is more common in high-income countries, like Canada, where food production is efficient and food loss is minimized.

The United Nations (UN) estimates that 30% of all food harvested is lost globally every year[2,3]. This loss and waste is responsible for 8-10% of global *greenhouse gas emissions*.[3] In Canada, we waste 2.3 million tonnes of food a year, at a cost of $20 billion to our economy![5]

While food that is lost and wasted could go towards feeding people, there are other resources that are also being lost and wasted.

- Energy – fuel used for farm production, transportation, processing.
- Water – used for crop production, livestock production, processing.
- Land – used to grow food, build processing plants, and roads, train tracks and airports for transportation of food. The need for increased production can put vulnerable land at risk.
- Money – used for farm inputs like seed, feed, and machinery, transportation cost like trucks and fuel and labour.

Not only does food loss and food waste contribute to greenhouse gas emissions, but any food that is disposed of in landfills creates *methane*, a greenhouse gas 25x more powerful than *carbon dioxide*.

Agriculture in the Classroom MANITOBA

Curriculum Connections (Gr 2-4)

GRADE 2-4 GENERAL LEARNING OUTCOMES AND GOALS

Science General Learning Outcomes	
B5	Identify and demonstrate actions that promote a sustainable environment, society, and economy, both locally and globally.
Social Studies Goals With respect to the environment, social studies enable students to:	
- recognize that a sustainable natural environment is essential to human life	
- assess the impact of human interaction with the environment	
- propose possible solutions to environmental problems	
- live in ways that respect principles of environmental stewardship and sustainability	

GRADE 2 SPECIFIC LEARNING OUTCOMES

Science	
2-0-3a	Brainstorm, with the class, possible solutions to a practical problem; and in small groups, reach consensus on a solution to implement.
2-0-3b	Create, with the class, a plan to solve a problem or meet a need. Examples: identify simple steps to follow, prepare a drawing of the object to be constructed...
2-1-07	Recognize that foods humans eat come from plants and animals and classify foods accordingly.
2-2-16	Describe ways humans dispose of solids and liquids to maintain a clean and healthy environment.
2-4-04	Identify positive and negative effects of changes in air temperature and air movement in indoor and outdoor environments.
Social Studies	
2-S-103	Make decisions that reflect care, concern, and responsibility for the environment.
2-S-301	Consider advantages and disadvantages of solutions to a problem.
2-KL-022	Explain the importance of conserving or restoring natural resources.

GRADE 3 SPECIFIC LEARNING OUTCOMES

Science	
3-0-3D	Brainstorm, in small groups, possible solutions to a practical problem, and reach consensus on which solution to implement.
3-0-8C	Recognize that designing a solution to a simple problem may have considerations, such as cost, materials, time, and space.
3-4-10	Describe ways to return organic matter to the soil. Examples: composting, spreading manure on fields...
Social Studies	
3-S-103	Make decisions that reflect care, concern, and responsibility for the environment.
3-S-301	Consider advantages and disadvantages of solutions to a problem.
3-KG-029	Identify ways in which community services can help people acquire their basic human rights. Examples: ensure quality housing, education, security, food, and water...
3-KG-027	Give examples of concerns common to communities around the world.
3-KG-031	Give examples of personal decisions and actions that may positively affect people locally or globally. Examples: charitable donations and projects, recycling...

GRADE 4 SPECIFIC LEARNING OUTCOMES

Science	
4-0-3D	Brainstorm possible solutions to a practical problem and identify and justify which solution to implement.
4-0-8C	Recognize that designing a solution to a simple problem may have considerations, such as cost, materials, time, and space.
4-1-10	Recognize that the food chain is a system in which some of the energy from the Sun is transferred eventually to animals.
4-1-15	Describe how their actions can help conserve plant and animal populations and their habitats. Examples: clean up a local stream to improve fish and bird habitat...
Social Studies	
4-S-103	Make decisions that reflect care, concern, and responsibility for the environment.
4-S-301	Consider advantages and disadvantages of solutions to a problem.
4-KL-023	Identify issues related to environmental stewardship and sustainability in Manitoba.

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) IN MANITOBA SCHOOLS

In 2015, the United Nations adopted a global action plan with 17 goals to reach for a more equitable, sustainable world. The Sustainable Development Goals (SDG) focus on ending poverty, improving health and education, boosting economic growth, preserving our natural environments, and engaging in climate action. Food loss and waste are strongly connected with goals:

Agriculture's role in reducing food loss and waste is also found in goals:

In Manitoba, there are curricular outcomes in kindergarten through grade 12 that incorporate Education for Sustainable Development into a student's education. Your class and school help move us all towards achieving our Sustainable Development Goals through engaging with food waste.

Focus on Manitoba

FARM

DUSTY RIDGE RANCH

Harold, Sherry and their five children raise sheep on their farm in southeastern Manitoba. Their family participates in Loop, a program that connects grocery stores and farmers to keep food that is no longer edible out of the landfill. The Bosma's pick up unsuitable food from the grocery store and feed it to their 240 ewes (and many lambs!) and other farm animals. Looking after the environment is important to the Bosma's and the Loop program is one way they do that.

FARM

SMITH FAMILY SEEDS

Walter Smith, together with his wife and five children are seed farmers and operate a seed cleaning plant on their farm in southern Manitoba. When seeds are being cleaned, the broken and damaged seeds are screened out and removed. These screenings cannot be used for food, but they are not thrown away. Livestock farmers in the area feed the nutritious screenings to their animals.

PROCESSOR

PEAK OF THE MARKET

Peak of the Market, a vegetable producing and marketing company, donates over 1,100 tonnes of produce every year to various organizations, food banks and service agencies throughout Manitoba. Keeping food out of the landfill while addressing local food insecurity and healthy eating initiatives commitments is one way that Peak of the Market achieves its commitment to improving sustainability.

PROCESSOR

ROQUETTE

Roquette opened the world's largest pea protein plant in Portage la Prairie in 2021. Roquette creates a variety of pea protein products to meet the increasing demand in plant-based foods. One of the by-products from pea processing is something called 'pea cream'. Instead of sending pea cream to landfills, Roquette sells this high-protein, nutritious by-product to livestock producers as a lower cost livestock feed option.

RETAIL

RED RIVER CO-OP

Red River Co-op is committed to reducing food waste from their nine retail grocery stores. In 2022, they diverted 1, 074 tonnes of food from the landfill. The diverted food goes to Leftovers Foundation (food is rescued for service agencies helping MBs in need), Loop (MB farmers feed the diverted food to their livestock), and Compost Winnipeg (all inedible food is picked up and taken to a Winnipeg composting facility).

DID YOU KNOW?

Bioplastic cutlery and cups, often made from corn and potato starch, can not biodegrade in your backyard composter. These need industrial composting conditions, with high heat, moisture and active aeration.

Activity 1: Follow the Food

OBJECTIVES

Students will:

- Create the food supply chain from farm to plate
- Identify how and where food is lost and wasted along the supply chain
- Explore what people in the agriculture industry do to reduce food loss and waste
- Propose ideas for reducing waste at school and home

Time: 20-40 min

DID YOU KNOW?

The average Canadian household throws away 140 kg worth of food every year at a cost of $1,300![5]

MATERIALS SUPPLIED

- 6 **Food Supply Chain** cards
- 15 **Food Loss** cards
- 7 **Food Waste** cards
- 22 **Food Save** cards
- **Activity 1: Follow the Food at School Student Worksheet** at the end of this teacher guide.

PREPARATION

To complete the Follow the Food activity, you will need:

- All 6 **Food Supply Chain** cards
- All the **Food Loss**, **Food Waste** and their matching **Food Save** cards
- Sticky tack or similar

Food Save cards identify how food losses and waste can be redirected into food for human consumption, livestock feed and compost, rather than the landfill.

TEACHER TIP!

To accommodate smaller classes, you can use fewer sets of **Loss**, **Waste** and **Save** cards.

You will need a minimum of 12 matching sets, (2 sets for each **Food Supply Chain** card) of **Food Loss** or **Waste** and matching **Food Save** cards. See the answer key below for a summary of all the cards and where they go on the **Food Supply Chain**.

Food Save cards have the same number as their corresponding **Food Loss** or **Waste** card for easy matching and selection.

ANSWER KEY

Supply Chain	Card	Food Loss	Food Save
Farm	1	Food is lost when insects or diseases damage the crop.	MB farmers use a pesticide to protect the crop from insects and diseases.
	2	Stored wet grain goes mouldy and cannot be used for food.	MB farmers use fans in their bins to dry the grain and prevent mould.
	3	Vegetables that are too large or small get thrown away.	MB farmers donate vegetables that are the wrong size to food banks.
	Video Alert: **Feeding Potatoes to Cattle at Birkland Farms in Winkler** (Western Cnd Feedlot Management School) first 2:30 min (see p.12 for details)		
	4	Damaged crops can't be sold for food and are thrown away.	MB farmers sell damaged crops to livestock farmers to feed to their animals.
	Video Alert: **Carrots for Cattle: Working Together to Prevent Food Waste** (Canadian Food Focus) 0:58 min (see p.12 for details)		
	5	Harvest provides more fruit than can be sold and eaten before it goes bad.	Harvested fresh fruit can be frozen, canned, or dried so food is not lost.
	6	Less food is produced when livestock get sick and die.	MB farmers vaccinate their livestock to keep them from getting sick and dying.
	7	Less food is produced when poor quality animal feed or water make livestock unhealthy.	MB farmers give their livestock good quality feed and clean water every day. CANADIAN LAW
	8	Damp Hay + Air = Mouldy Hay Livestock can't eat it!	MB farmers wrap damp hay bales in plastic to keep out the air and prevent mould.
Transportation	9	Livestock that are too crowded on a truck leaving the farm get injured and can't be used for food.	MB farmers and truck drivers must make sure livestock have enough room in the truck. CANADIAN LAW
	10	Processors reject food bruised during transport, so it is thrown away.	Community kitchens take bruised food, cut away the bruise, and use the rest.
Processing	11	Badly packaged food spoils and must be thrown away.	Processors must follow rules for safe food packaging. CANADIAN LAW
	12	Food processing creates wastes like meat scraps which are thrown away.	Meat scraps are made into pet food.
	13	Broken seeds are cleaned from harvested crops and not used for food.	MB farmers sell broken seeds for livestock feed.
	Video Alert: **Waste Not, Want Not** (Manitoba Pork) 2:15 min (see p.12 for details)		
Transportation	14	A shortage of truck drivers caused food to spoil before it could be delivered to the retailer.	Our government provides money to train new truck drivers.
	15	Hot weather causes food to spoil while being transported to the retailer.	To prevent spoiling, food is kept at a safe temperature while being transported. CANADIAN LAW
Retail	16	Grocery stores throw out food that is past its 'best-before' date.	Grocery stores lower the price of foods that are close to their 'best before' date to sell them quickly.
	Video Alert: **Redirecting Food and Reducing Food Waste** (CBC Manitoba) 2:22 min (see p.12 for details)		
	17	Grocery store food that is no longer edible is sent to the landfill.	Grocery store food that is no longer edible is picked up for composting.
	Video Alert: **Food Waste Reduction** (Red River Co-op) 2:51 min (see p. 12 for details)		
	18	Restaurants throw out customers uneaten food.	Restaurants provide customers with containers to take uneaten food home.
Home	19	There is so much food in the refrigerator that some goes bad before it can be eaten.	Make a grocery list before shopping so you don't buy too much food and then waste it.
	20	Leftover food from supper was thrown away.	Put leftover food in the refrigerator or freezer to eat later.
	21	An unopened package of cereal is past its "best before" date, so it is thrown away.	Food that is past its 'best-before' date can still be safe to eat. Use your eyes and nose to decide.
	22	A package of ground beef reached its "best before" date, so it was thrown out.	Cook the ground beef, refrigerate it, then eat it within 2 - 4 days or freeze it.

ACTIVATE

Suggestions for activate activities.

1. Video

   Introduce the idea of food waste by showing The Extraordinary Life and Times of Strawberry (National Resources Defence Council) – Watch the journey of a strawberry, freshly picked from a farm, make its way across the country to a family's refrigerator where it goes mouldy and is thrown away. (1.52 min)

   https://www.youtube.com/watch?v=uTaFYF1nA4c

2. Vocabulary review

   As a class, discuss and define these words:

crop	compost	food loss
livestock	landfill	food waste
methane	food supply chain	

ACQUIRE

In Activity 1: Follow the Food, students, using the cards provided, will work together as a class to:

- Create a simple food supply chain display
- Match food loss and food waste cards to the part of the food supply chain where they occur.
- Match a food save card to its corresponding food loss or food waste card.

SUGGESTIONS FOR DELIVERY

1. Divide your class into 6 groups
2. To create the food supply chain display:
   i. Give each group 1 **Food Supply Chain** card.
   ii. Have one student from each group bring their **Food Supply Chain** card to the front of the room. Decide as a class what each card is about and what order they should go in to get food from the farm to their plate.
   iii. Then stick the cards to the front of the classroom (whiteboard/blackboard) leaving a minimum of 12" between each card. (The space will be needed to display the **Food Loss**, **Food Waste** and **Food Save** cards.)

3. To add **Food Loss**, **Food Waste** and **Food Save** cards to the Food Supply Chain:

For younger grades:

a. Give each group 1 **Food Loss** or **Food Waste** card. (Tip: Select cards from different parts of the **Food Supply Chain**. i.e. Cards #1, 9, 11, 14, 16, 19.)

b. Have each group decide where it goes on the **Food Supply Chain** and send 1 student to stick that **Food Loss** or **Food Waste** card onto the **Food Supply Chain**.

c. Then give each group 1 of the matching **Food Save** cards. (Tip: make sure to randomly give out the same card #s as in a. above.)

d. Now for each **Food Loss** or **Food Waste** card on the **Food Supply Chain**

   i. First decide as a class if it is in the right place on the **Food Supply Chain**.

   ii. Then see which group has the matching **Food Save** card and add that **Food Save** card to the display.

e. Repeat until all cards have been added to the display.

For older grades:

a. Hand out all the **Food Loss**, **Food Waste** and **Food Save** cards by giving each of the 6 groups a random selection of

   i. 2 – 3 **Food Loss** cards

   ii. 1 - 2 **Food Waste** cards and

   iii. 3 –4 **Food Save** cards

b. Have each group pick 1 **Food Loss** or **Food Waste** card, decide where it goes on the **Food Supply Chain** and send 1 student to stick that **Food Loss** or **Food Waste** card onto the **Food Supply Chain**.

c. For each card

   i. First decide as a class if the **Food Loss** or **Food Waste** card is in the right place on the **Food Supply Chain**.

   ii. Then see which group has the matching **Food Save** card and add that **Food Save** card to the display.

d. Repeat until all cards have been added to the display.

4. Discuss any of the following with your class:
   1. What was surprising about where or how food is lost or wasted?
   2. How does reducing food loss and waste help our environment?
   3. How has the agriculture industry in MB been able to significantly reduce food losses?

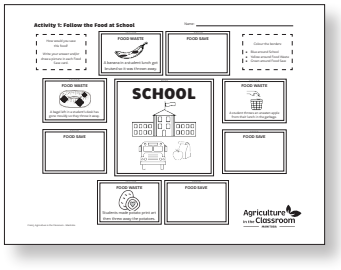
TEACHER TIP!

Refer to **Background Information** on p. 1 for more in depth information that could be used as part of the class discussion.

APPLY

The **Follow the Food at School** worksheet provides students with the opportunity to propose their own food saves for common food waste examples at school.

Photocopy 1/student of this 1-page worksheet which can be found at the end this teacher guide.



Activity 2: Balloons Go Bananas!

OBJECTIVES

Students will:

- Create an anaerobic environment to mimic landfill conditions with food waste,
- Observe gas being produced by anaerobically decomposing food waste, and
- Describe why landfills are not a good place for food waste.

Time: 10-20 min to set up (up to 5 days of observation).

MATERIALS SUPPLIED

- 12 premium latex balloons (3X blue, green, yellow, and white). Helium quality latex helps keep the gas in longer than a regular balloon but eventually it will escape.

MATERIALS NEEDED

- 4 clear empty plastic or glass bottles (~500 mL).
  Avoid flimsy water bottles, as they are difficult to put food and water inside and get a balloon on top without making a mess. Also, avoid juice bottles with their wider necks as the balloons can tear.
- Food scraps that can be cut or torn into small pieces.

DID YOU KNOW?

MB landfills are full of food and food waste! 44% of Winnipeg's waste comes from food.[1]

PREPARATION

1. Gather 4 plastic or glass bottles for the experiment.
2. Collect food scraps from school lunches or from home to use in the experiment. Approximately 2-3 cups of food scraps will be enough for the experiment.
3. Print off student worksheet **Activity 2: Balloons Go Bananas! Experiment** at end of this teacher guide.

ACTIVATE

1. Ask students if they know where food goes after it is thrown in the garbage?
2. Ask students how they think a compost pile is different from a landfill. A compost pile has oxygen in it whereas a landfill has been packed down so that there is no air in it. Without air, decomposing food creates methane gas.

DID YOU KNOW?

It can take up to 25 years for a head of lettuce to decompose in a landfill![6] Unlike a compost pile, there is very little air in a landfill once the garbage has been covered and packed down.

SUGGESTIONS FOR DELIVERY

1. Tell students they are going to do a mini landfill experiment in the classroom with bottles, water, food scraps and balloons.
2. Have students either tear or cut up food scraps so that they are small enough to push through the opening of the bottle. The smaller they are the easier they are to get out afterwards!
3. Ask students to put the food scraps in 3 of the bottles, so that the bottles are a third to half full of food waste.
4. Discuss with students why the food waste must be covered with water? This creates an anaerobic environment, like the landfill.
5. Have students fill all 4 bottles with water up to where the neck of the bottle starts.
6. Stretch a balloon over the top of each of the 4 bottles, being careful not to tear the balloon. Make sure the neck of the balloon is snuggly over the neck of the bottle. If in doubt, tape the balloon and bottle necks together to reduce any loss of the gases.
7. Hand out the student worksheet **Activity 2: Balloons go Bananas! Experiment** and have students draw what each bottle looks like with its balloon on top and food waste inside. Have students predict what they think will happen to the balloons and why.
8. Put the bottles in a warm location.
9. Have the students observe the bottles for ~ 5 days. (Warmer locations create gas faster; cooler locations can take longer.) As the food waste decomposes in an anerobic environment, gas will be produced and will inflate the balloon. The bottle with water in it will still have a deflated balloon attached to it as no decomposition has occurred.
10. Have students complete the student worksheet **Activity 2: Balloons go Bananas! Experiment** and compare it with what they observed after setting up the bottles.
11. Remove the balloons and discard the water and food waste.

TEACHER TIP!

Bananas are consistently amazing at producing gas when they decompose. If possible, have one bottle just with banana peel scraps. Experiment with the other 2 bottles, one with a mix of everything and another with just one type of food waste.

DID YOU KNOW?

The Brady Road landfill in Winnipeg captures methane from anaerobic organic matter decomposition. Plans for the future include using the methane as an energy source, but right now it is burnt off to prevent the methane from escaping into the atmosphere.

The Brady Road landfill burns off methane to the equivalent of 21,700 cars/year![4]

Class Discussion Questions:

1. Ask students to share what happened in their balloons. Did some food waste inflate the balloons more than others? Why did the one with just water in it not inflate?
2. Discuss with students why keeping food out of landfills is important.

EXTENSION

1. Show the video **"How Rotting Vegetables Make Electricity"** (5:31 min) to learn about how food waste is turned into energy in India with methane biodigesters.

Video Summary

1. **The Extraordinary Life and Times of Strawberry** (*National Resources Defence Council*) – Watch the journey of a strawberry, freshly picked from a farm, make its way across the country to a family's refrigerator. (1.52 min)
   https://www.youtube.com/watch?v=uTaFYF1nA4c

2. **Food Waste Reduction** (*Red River Coop*) - Grocery stores in Winnipeg are reducing their food waste by working with Leftovers Foundation and Loop to get food that is still edible, but past its best-before date to food banks and organizations that help feed people. Red River Coop works with Loop and farmers to provide feed to livestock. And they work with Compost Winnipeg to compost the scraps from their own food processing and preparation, including meat and dairy! (2:51 min)
   https://youtu.be/Kg_LeWKeHzw

3. **Waste Not, Want Not** (*MB Pork*) Waste products from other food supply chain industries can be turned into food for pigs. Some of the ingredients used in pig feed are the by-products from other industries. Manitoba hog farmers are finding good feed value in ingredients that may have otherwise ended up in the landfill and are turning them into high quality pork protein. (2:15min)
   https://www.manitobapork.com/educational-videos

4. **Carrots for Cattle: Working Together to Prevent Food Waste** (*Canadian Food Focus*) – At the Bradshaw's carrot farm in AB, one third of the carrots they produce can't be sold at the grocery store. They donate as many of the carrots as they can to food banks but there is still a lot left over. Join Shelley Bradshaw on a brief but fascinating tour of their carrot processing and her brother-in-law's cattle farm not far away. The cattle love the carrots and keep them from going to waste! (0.58 min)
   https://canadianfoodfocus.org/canadian-food-stories/carrots-for-cattle-working-together-to-prevent-food-waste/

5. **Redirecting food and reducing food waste** (*CBC Manitoba*) – A new app, 'Too Good To Go' was launched in Winnipeg in the summer of 2022 and connects businesses with customers to sell food at a significantly reduced price. Meet a Winnipeg retailer who uses 'Too Good To Go' to keep food out of the landfill. (2:22 min)
   https://www.cbc.ca/player/play/2163440195798/

6. **How Rotting Vegetables Make Electricity** (*Insider Business*) – Travel to India to see how food that is wasted at markets is turned into biogas through innovative technology. (5:31min)
   https://www.youtube.com/watch?v=c1adiK8nLbA

7. **Feeding potatoes to cattle at Birkland Farms in Winkler** (*Western Canada Feedlot Management School*) Prepare to be amazed at just how many potatoes don't make it to the grocery store (wrong size, or damaged) but do get fed to 8,000 cattle on Birkland Farms. Manure from the feedlot gets composted and then spread back on the potato fields. While the video is targeted at farmers, students will appreciate the scale of their farm operation in the first two and a half minutes. (12:59 min)
   https://www.manitobacooperator.ca/livestock/feedlot-finding-success-feeding-food-waste/

Additional Projects

1. CLASSROOM AND SCHOOL COMPOSTING

a. **A Guide for School Composting** (*Green Action Centre*) – Learn about how to compost outdoors at your school, with tips on working with school administration, parents and students, classroom compost collection, types of bins (DIY and bought), maintenance and use of the compost.
https://greenactioncentre.ca/wp-content/uploads/2019/01/school-composting-guide-2018.pdf

b. **A Guide for Vermicomposting** (Green Action Centre) – Learn about how to create a worm habitat in your classroom and feed your lunch scraps to red wigglers to transform it into nutrient rich compost.
https://greenactioncentre.ca/wp-content/uploads/2020/06/Vermi_8pg_1logo_JUL2016_WEB.pdf

c. **Compost Winnipeg** – Is your school in Winnipeg but you are unable to compost at the school? Consider having all your compostable waste picked up weekly at your school by Winnipeg Compost for $100/month. Check out their service area map on their website.
https://compostwinnipeg.ca/

2. REDUCING FOOD WASTE – Interested in doing a waste audit at your school, to find out how much of your waste is food? Check out MBs Recycle Everywhere "Waste Audit Toolkit" resource for schools.
https://recycleeverywhere.ca/programs/school/

Recommended Classroom Books

Worms Eat Our Garbage: Classroom Activities for a Better Environment. M. Apelhof, M.F. Fenton, B. Loss Harris. (2003). Flower Press. ISBN: 978-0977804504

Green Machine: The Slightly Gross Truth about Turning Your Food Scraps into Green Energy. R. Donnelly, C. Jacques. (2020). Goodwin Books. ISBN: 978-1250304063

Compost Stew: An A to Z Recipe for the Earth. M. McKenna Siddals, A. Wolff. (2010). Dragonfly Books. ISBN: 978-0385755382

Additional Information

RESOURCES

Refuse Refuse – A Guide to Waste Reduction in Manitoba Schools - MB Education (2014) – Based off the steps taken at Landmark Elementary School in Hanover School Division, this guide provides information on the role that schools can take in waste reduction along with practical steps and resources for other schools interested in reducing their waste.
https://www.edu.gov.mb.ca/k12/cur/science/support/refuse/index.html

Best Practices for Waste Management – A guide for school communities in Canada (EcoSchools/ ÉcoÉcoles Canada) – Information and tips to help schools wanting to improve waste management (recycling, compost, garbage) at their school.
https://ecoschools.ca/wp-content/uploads/2022/05/Best-Practices-for-Waste-Management-Guide.pdf

FOOD RECOVERY AND RESCUE ORGANIZATIONS

1. **Second Harvest** – The largest food rescue organization in Canada that connects food producers, processors and retailers with service agencies to keep food out of landfills and feed people.
   https://www.secondharvest.ca/
2. **Leftovers Foundation** - Together with Second Harvest, Leftovers Foundation in MB rescues food and gets it delivered to service agencies in MB with the help of volunteer drivers.
   https://rescuefood.ca/
3. **Loop Resource** – The invention of a BC farmer, Loop is now a national resource that connects grocery stores and farmers together to divert unsaleable grocery store waste to feed farm animals.
   https://loopresource.ca/
4. **Too Good to Go** – Started in Denmark and now in Winnipeg, food retailers with surplus food can post their goods on the 'Too Good To Go' app and consumers can check out the app to find discounted food throughout the city.
   https://toogoodtogo.ca/en-ca/
5. **Flash Food** – Grocery stores in North America offer food that is nearing their best before date at a discount. Using their app, consumers can find discounted food at their local grocery store. In MB there are 24 No Frills + Superstore locations that use the FlashFood app.
   https://www.flashfood.com/

Sources

1. Winnipeg Food System Snapshot (City of Winnipeg). 2022.
   https://clkapps.winnipeg.ca/dmis/ViewPdf.asp?SectionId=672357
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   https://www.fao.org/3/ca6030en/ca6030en.pdf
3. Food Waste Index Report. (United Nations Environment Programme). 2021.
   https://www.unep.org/resources/report/unep-food-waste-index-report-2021
4. Brady Road Resource Management Facility (City of Winnipeg; Water and Waste Department). 2020.
   https://legacy.winnipeg.ca/waterandwaste/garbage/bradyMethane.stm

5. Food Waste in Canadian Homes - A Snapshot of Current Consumer Behaviours and Attitudes (Love Food Hate Waste). 2020 (updated for 2022 inflation).
https://mustelgroup.com/wp-content/uploads/2020/09/LFHW_FoodWasteInCanadianHomes_ENG_04-FINAL.pdf
https://lovefoodhatewaste.ca/about/food-waste/
6. Seeking the Truth in Refuse (New York Times). 1992.
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Photo Credits

Focus on Manitoba – Dusty Ridge Ranch, Smith Family Seeds, Peak of the Market, Roquette, Red River Coop and Ruth Bonneville (Wpg Free Press)

Food Supply Chain transportation card - Dairy Farmers of Canada (Twice Brand)

Food Save card #13 - T. Carter (Beef Cattle Research Council)

Food Save card # 3 - Peak of the Market

Food Supply Chain processing card - Peak of the Market

Vocabulary

Anaerobic decomposition – When organic matter decomposes in the absence of oxygen it is called anerobic decomposition. Anaerobic decomposition produces methane gas, a powerful greenhouse gas. Landfills create methane gas from decomposing food waste.

Crop – Any plant grown for food, livestock feed, fibre, energy production or industrial use.

Compost – Compost is the end product of aerobic (in the presence of air) decomposition of organic materials. Compost is high in nutrients that plants need (nitrogen, phosphorus and potassium) and rich in microorganisms.

Farm inputs –All the materials (seed, fertilizer, machinery, loans etc.) and labour needed to grow a crop or raise livestock.

Food loss – Any food that does not make it to retailers or homes for consumption is considered food loss. These losses happen during production on the farm, in storage, during transportation, and processing. In low-income countries, food loss is more common.

Food rescue – Food that is edible and nutritious but is otherwise near it's 'best before' date or is surplus and would be thrown out. If this food is diverted from being thrown out and redistributed to service agencies and their clients, this food is considered to be rescued.

Food supply chain –A food supply chain is the process by which food moves from farm to plate starting with production (farming) and including transportation, processing, distribution, and consumption.

Food waste – Food that is ready to eat, either from a food store, restaurant or at home but is thrown away is food waste. Wasted food comes from throwing away leftovers, having food spoil before it is eaten, and from retailers throwing out food because it is not selling, is damaged or is close to its best-before date. In high-income countries, food waste is more common.

Food security – The United Nations describes food security as all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary need and food preferences for an active and healthy life[7]

Grain – Grains are small dry seeds which are grown and used for food. Examples include cereal crops such as wheat, corn, and rice, and legumes such as lentils, peas and beans.

Greenhouse gases – Certain gases trap heat energy within our atmosphere. These gases are referred to as greenhouse gases since they elevate the temperature inside our atmosphere, like a greenhouse. Greenhouse gases include carbon dioxide, methane and nitrous oxide.

Livestock – For the Follow the Food activity, any agricultural animal that is domesticated and raised for their meat, milk, leather, fur, eggs and wool, or for physical labour is referred to as Livestock.

Methane – Methane (CH_4) is a greenhouse gas that is 25X more powerful than CO_2. Activities that create methane gas include natural gas systems, landfills, mining, livestock, soil reactions and other chemical processes. Landfills account for 17% of methane emissions.[8] Natural wetlands produce around 30% of global methane emissions.[9]

Pesticide – Pesticides are products used to prevent, repel, decrease, or kill a variety of pests. In agriculture the most common pesticides are for insects, weeds, and diseases. Pesticides can be made from natural sources or synthesized. Before a pesticide can be marketed in Canada it must meet the health and safety standard set out by Health Canada.

Retail – Retailer businesses sell food that is ready to be taken home to be prepared and consumed (grocery stores) or that is prepared and eaten on the premises (restaurants).

Activity 1: Follow the Food at School

Name: _____

How would you save this food?

Write your answer and/or draw a picture in each Food Save card.

YELLOW

FOOD WASTE

A banana in a student lunch got bruised so it was thrown away.

GREEN

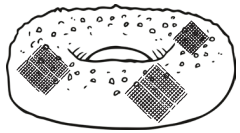
FOOD SAVE

Colour the borders:

- Blue around School
- Yellow around Food Waste
- Green around Food Save

YELLOW

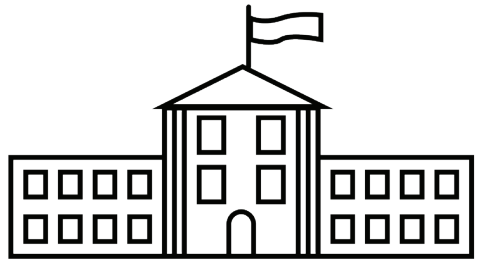
FOOD WASTE

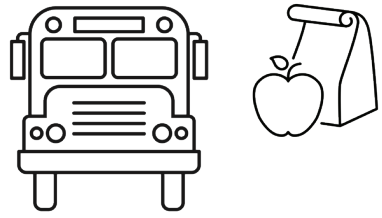


A bagel left in a student's desk has gone mouldy so they throw it away.

BLUE

SCHOOL





YELLOW

FOOD WASTE

A student throws an uneaten apple from their lunch in the garbage.

GREEN

FOOD SAVE

GREEN

FOOD SAVE

YELLOW

FOOD WASTE

Students made potato print art then threw away the potatoes.

GREEN

FOOD SAVE

Agriculture in the Classroom MANITOBA

Activité no 1 : Suivez les aliments

Nom : _____

Comment sauveriez-vous cette nourriture ?

Écrivez votre réponse et/ou dessinez une image dans chaque fiche d'Aliments Préservés.

JAUNE

GASPILLAGE ALIMENTAIRE

Un élève trouve une banane meurtrie dans son lunch et la jette.

VERT

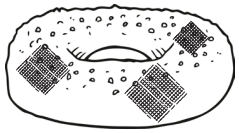
ALIMENTS PRÉSERVÉS

Coloriez les bordures :

- Bleu autour de l'École
- Jaune autour du Gaspillage Alimentaire
- Vert autour des Aliments Préservés

JAUNE

GASPILLAGE ALIMENTAIRE



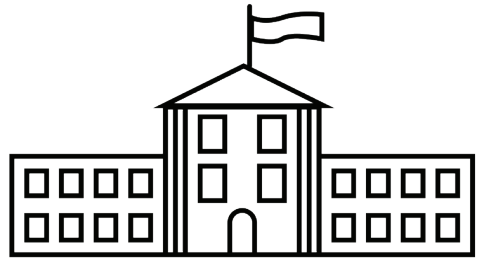
Un bagel laissé dans le bureau d'un élève a moisi, il est donc jeté.

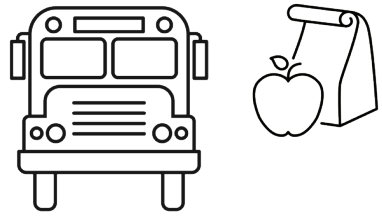
VERT

ALIMENTS PRÉSERVÉS

BLEU

ÉCOLE





JAUNE

GASPILLAGE ALIMENTAIRE

Un élève jette la pomme qu'il avait dans son lunch sans l'avoir mangée.

VERT

ALIMENTS PRÉSERVÉS

JAUNE

GASPILLAGE ALIMENTAIRE

Des élèves ont fait une activité d'impression avec des pommes de terre, puis ont jeté les pommes de terre.

VERT

ALIMENTS PRÉSERVÉS

Agriculture en Classe
MANITOBA

Name: _____

Activity 2: Balloons Go Bananas! Experiment

DATE: _____

PREDICTIONS:

_____

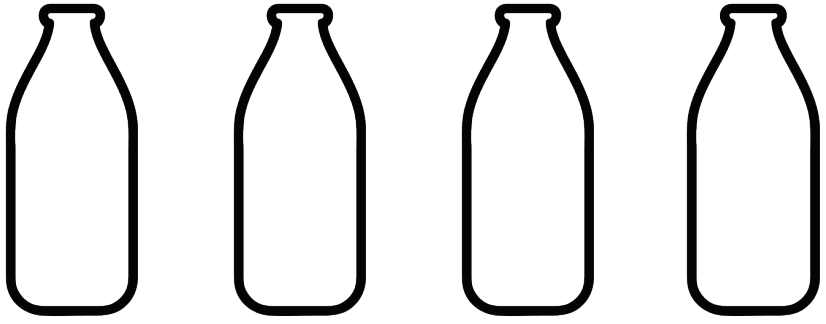
_____

_____

_____

_____

_____



DATE: _____

OBSERVATIONS:

_____

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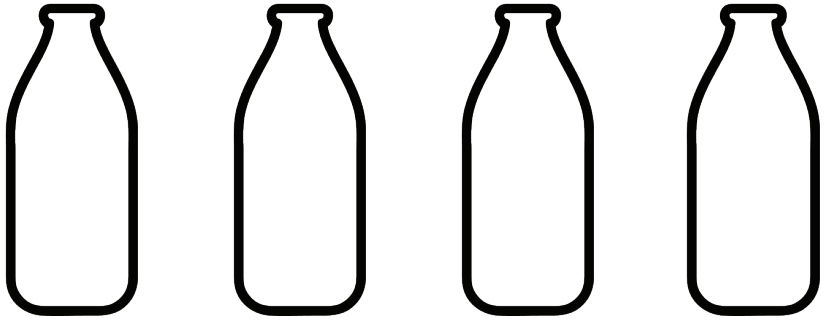


Agriculture in the Classroom MANITOBA

Nom : _____

Activité no 2 : Les pelures puissantes! Expérience

DATE : _____

PRÉDICTIONS :

_____

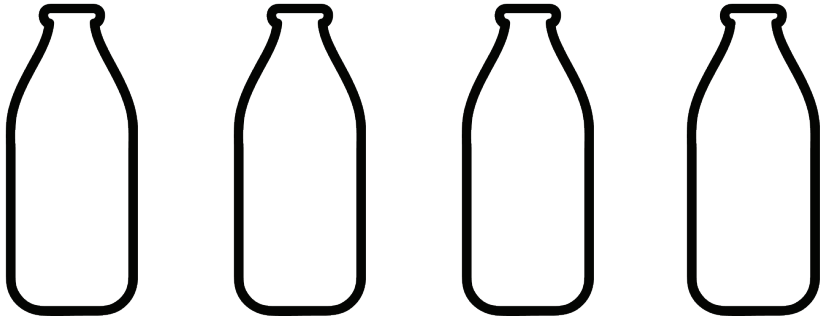
_____

_____

_____

_____

_____



DATE : _____

OBSERVATIONS :

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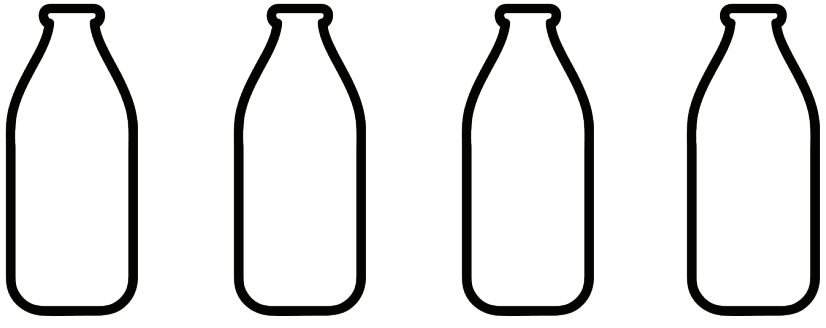

Agriculture en Classe MANITOBA