WASTE FACILITY TOUR FOR SCHOOLS

POST-TOUR ACTIVITIES

These activities support students to reflect on their recent waste facility tour, the questions they have generated, and communicate what they've learned using a choice of approach. Students will:

- *Consider how the facility fits into the big picture of the overall waste management system by reviewing the Top Six2Fix*
- *Conduct a life cycle analysis on Tetra Paks*
- *Rethink waste by exploring an online tool to examine proper waste disposal*
- *Challenge the myth and widely held view that recycling is the only way to manage waste by brainstorming other ideas*
- *Take action to reduce waste by developing a personal commitment*

Teachers may choose to move through these activities in sequence (our suggested approach) or select individual activities.

ACTIVITY I: WASTE WONDERS REVISITED (30 – 40 MINUTES)

1. Ask students to reflect on the facility tour, including how their perspective on waste may have changed, and review the questions that students created prior to and at the facility using an approach of your choice, such as:
   a. JOURNAL: Have students work individually in their journals to review their Waste Wonders by filling in information they learned and/or any new questions that emerged.
   b. SHARE: In small groups, or pairs, have students share their Waste Wonders and what they learned. Have them work together to create new questions to display as a whole class. Conduct a walk-about so everyone can read and discuss all the questions.
   c. DRAW: In pairs, have students select one Waste Wonder and design a picture along with short text to communicate to others what they learned.
   d. PERFORM: In small groups, have students select one Waste Wonder and use it to design lyrics to a rhyme or rap that illustrates what they learned. Have the rest of the class guess what the question is.
2. Option: After reviewing their Waste Wonders, enable students to explore resources such as the Metro Vancouver website or their local municipality website to add to their understanding and/or generate new questions about waste and waste systems.
3. As a class, facilitate a debrief to summarize their understandings about the problem of waste, the facility, and the overall waste system.

ACTIVITY II: THE BIG PICTURE OF WASTE

PART 1: TOP SIX2FIX (15 MINUTES)

1. Lead students through (or review if completed as a pre-visit activity) the What's In Our Garbage? Exploring the Top Six2Fix Inquiry Spark.
2. Debrief how the information in the Inquiry Spark fits together with their knowledge of Metro Vancouver's waste management facilities by reviewing the Metro Vancouver Solid Waste System Fact Sheet and Solid Waste System Overview, asking the group questions, such as:
   - *What happens to the Top Six2Fix after they leave homes?*
   - *How does information like the Top Six2Fix help residents and Metro Vancouver to manage waste?*
   - *What if we fix these six? What might happen at the Waste-to-Energy Facility? The Landfill?*

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PART 2: LIFE CYCLE OF A TETRA PAK (45 MINUTES)

Students analyze the life cycle of an item to understand the phases (production, distribution, use, and waste) and impacts of these phases so they can apply their understanding of how this analysis can be used for other items and choices in daily life.

1. Collect a Tetra Pak (or multiple Tetra Paks if the activity will be done in small groups), e.g., milk carton, juice box.
2. Explain that they are going to break down a common product (Tetra Pak) to explore the pros (positive impact) and cons (negative impact) of how this item is made, from making (production), through the distribution, use, and disposal of the product.
3. Form small groups and have them write down their predictions of the pros and cons of a Tetra Pak.
4. As a class, or in small groups, take apart a Tetra Pak (carefully peel apart all layers that exist). Scissors may be helpful if used carefully!
5. Provide each group with a variety of coloured markers and a large format paper or white board for them to create a chart, similar to the one below:

Life Cycle Analysis	Make It	Move It	Use It	Lose It
What? How?				
Pros				
Cons				

6. Either assign each column to one or two groups, or have all groups complete as much of the chart as possible. Ask students to consider:
   - ***Make it*** *– What is it made of? How are each of its parts made? What resources are used?*
   - ***Move it*** *– What moves it from factory to store? How does it move? What resources are used?*
   - ***Use it*** *– What makes it useful? How is it used?*
   - ***Lose it*** *– What happens when it's no longer needed? How is it handled? What resources are used?*
7. Share the history and story of Tetra Pak: Tetra Pak Packaging Material (includes 3:00 video)
8. Compile information from all groups on a master life cycle analysis. See final page for sample answer key.
9. Debrief the class with questions, such as:
   - *What part(s) of the chart were the easiest to complete? The hardest?*
   - *What did you learn?*
   - *How does this relate to your daily choices to use Tetra Paks? What about other (similar or not similar) items?*
   - *What would happen if products were labeled with their life cycle analysis?*
10. Summarize student learning about life cycle analysis and how this relates to complex decision-making they are faced with every day, such as:
    - *There are pros and cons for all choices that need to be considered.*
    - *There are many people's opinions to consider, which may have different goals and interests.*
    - *There are positive and negative consequences. Some are short-term and others are longer-term, and some are unintended.*
    - *Our choices may be different day-to-day and depend on changing needs and interests. Our choices may be different from other people's choices.*
    - *Our choices depend on variables like convenience, information (or lack of), personal interests, caring beyond ourselves for other beings in communities and ecosystems.*

Extension: Invite students to use the design thinking process to suggest a different way of packaging juice and complete the life cycle analysis chart for comparison.

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ACTIVITY III: RETHINKING WASTE

PART 1: WHAT ABOUT RECYCLING? (15 MINUTES)

1. Facilitate a discussion about the challenges of keeping recyclable waste out of the Vancouver Landfill and Metro Vancouver Waste-to-Energy Facility.
    - *What kinds of waste can we recycle at home, at school, at community buildings?*
    - *Where else can we take the recyclable waste we generate? What is needed to do this (how far away is it)?*
    - *Do students in other municipalities, provinces, and countries follow the same process, for the same kinds of recyclable waste? Why or why not?*
2. Have each student identify an item of waste that they're uncertain about how to dispose of (or recycle).
3. Ask students to find out how to dispose of that item using the online tool Metro Vancouver Recycles.
4. In pairs, have students share what they found about waste disposal, and repeat with a new partner, one or more times.
5. After the class becomes familiar with a range of items and various ways that waste is managed, debrief using questions such as:
    - *What was the most surprising thing you discovered about waste disposal?*
    - *Why is proper disposal important?*
    - *What conclusions can we make about the challenges of proper disposal?*
    - *What might a zero-waste home, school, or community look like?*

PART 2: BEYOND RECYCLING WITH RE–WORDS (30 MINUTES)

Engage students in thinking about how we can look beyond recycling to reduce waste and discover actions we can take that use less resources like water and energy, cost less, and are easy to do.

1. Form small groups and equip each with wide-tipped markers (one per person) and one large piece of paper (i.e. chart paper), a white board, or the reverse side of a laminated poster/map.
2. Ask each group to write three words, Reduce, Reuse, and Recycle, somewhere on their paper/white board. Have each group discuss how these words are connected to waste and prepare to share one idea they come up with.
3. Have each group share one idea with the whole group and then discuss the meaning of each word and why they begin with the same preposition 'RE'.
4. Explain that the next activity is a challenge to come up with many words in a short amount of time. Everyone should have a marker so ideas can be added quickly as they come to mind, anywhere on the page. When you think of a word, say it as you add it to the page. This will help others on your team come up with new words.
5. Announce the challenge: "When I give the signal, write as many different words that start with 'RE' as possible. Uncap your marker. You have 5 minutes. Go!" Provide a signal to stop and have students cap their marker.
6. Ask groups to review their words, consider the connections to waste, and decide together which word is the:
    - *Easiest to do - circle it,*
    - *Lowest cost - add a dollar sign beside it,*
    - *Biggest impact - put a WOW box around it,*
    - *Most unique (i.e. you think no other team has this) - add a thought cloud*

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7. Compile all words: ask each group to share one word they generated, and the waste connection, until all words have been shared.

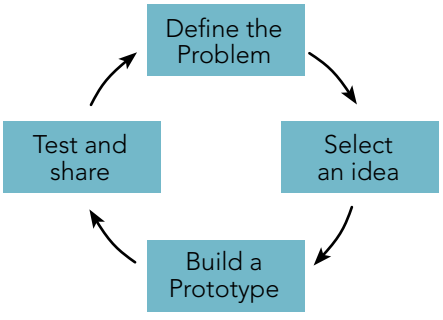
8. Debrief the activity to draw out their ideas and build understandings of the waste hierarchy, zero waste and circular economy with questions, such as:

- *What happened during the challenge as you generated RE words?*
- *What did you learn?*
- *How do the words relate to waste and resources?*
- *What conclusions can we make about the relationship between reducing, reusing and recycling?*
- *If we aim for zero waste, what actions do you think will help us the most with that goal? Why?*

PART 3: DESIGNING FOR ACTION AT SCHOOL (60 MINUTES+)

1. Ask students to consider how they might build actions to reduce waste in their school. Introduce students to four steps in Design Thinking that can support the action planning process:

- ***Define the problem*** *– Identify a problem, and learn about any specific needs*
- ***Select an idea*** *– Look at the problem from different perspectives and consider solutions*
- ***Build a prototype*** *– start to create a solution*
- ***Test and share*** *– Create, test, and evaluate your solution*



2. As a class (younger students), or in small groups (older students), choose a waste problem at the school. Emphasize the iterative nature of this process (there are no bad ideas!), and guide groups through the following process:

a. Define the problem:
   - *Why is this a problem? What do we need to solve it? What has been tried?*
   - *What actions might we try?*
   - *How will we know we're making a difference?*
   - *What information is important to share?*

b. Select an idea, and generate a list of possible action strategies. From this list, select one to try!
   - *Why do you think this strategy will be successful?*
   - *How will you know if the strategy is successful?*

c. Build a prototype: draft a design that will promote your idea to others at your school. Ideas may include: poster, a comic strip, a story, a rap.

d. Run a test, and ask for feedback (this could be done in a variety of ways such as through a short survey, or by measuring change through a waste audit).

e. Reflect on your design, and identify any next steps (hint: go back to the start!).
   - *How successful was your action in changing behavior and reducing waste?*
   - *How might we improve this action to be more successful?*

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ACTIVITY IV: FINAL REFLECTIONS TO MAKE A DIFFERENCE (20 MINUTES)

1. Have students journal about how their waste-related decisions are impacted by what they've learned by asking: *How does your understanding of waste management affect you?*
2. Ask students to identify a personal commitment to reduce waste and describe in their journal how they will do this through their daily choices.

EXTENSIONS

Look at Landfills – Go deeper into how landfills operate. What sort of site is required for a landfill? Why are certain items not accepted at landfills? What can a closed landfill be used for (it's estimated the Vancouver Landfill will be full by 2030)? If you had to locate another landfill in the Metro Vancouver region, where would you put it (tip: use the Metro Vancouver satellite map)? Why? How big would it have to be?

No Thanks, I'm Full – You are the manager of a landfill that is soon to become full. You notice some of the items getting dropped off at the landfill are recyclable. Design a solution to this problem. Ideas might include designing a recycling depot (what items would you collect? how would you solve contamination issues?), a ferrous metal recovery solution, or other innovation.

New Habits – Write a journal entry explaining how your garbage habits have changed since you started talking about solid waste in class. Are you doing something differently now, or do you plan to? Explain why or why not.

Student Art and Supplies Re-Use Centre – With teacher guidance, students can set up and manage an art re-use centre that could contain items like corks, tiles, metals, paper, fabrics, buttons, plastics, paper goods – anything that is often thrown out and that teachers might find a use for in the school. These items can be used for visual art projects or as office/classroom supplies. Students can be inspired by the local independent business Urban Source, in Vancouver.

RESOURCES

K-12 Resources – Solid Waste

K-12 Curriculum Connections – Solid Waste

Metro Vancouver Solid Waste System Overview

Circular Economy (Video - 2:30)

National Zero Waste Committee - Circular Economy

LIFE CYCLE ANALYSIS – ANSWER KEY

Life Cycle Analysis	Make It	Move It	Use It	Lose It
What? How?	Paper, Wax, Aluminum, Plastic Consume energy for extraction and processing Use water in processing Release of toxic chemicals during production	Trucks distribute to stores and the product moves from the store by consumers	Single-use only The straw can be a litter issue These containers pack easily for lunches (school or work) or other situations	The container and the straw become waste and are disposed Some containers are sent to recycling centres, while others go into the garbage to be disposed in a landfill, and some become litter in the environment
Pros	Made of lightweight materials: polyethylene, paper and aluminum fused together	Cost effective compared to glass Lighter, maximizes use of space with shape of packages and not as breakable Tetra-Paks are the most space and fuel efficient single-use container and the only one that does not require refrigeration	Convenient to carry, use and store Stable shelf life	The containers can be crushed to take up less space
Cons	Paper - Loss of forest habitat Wax & Plastic - oil extraction, carbon dioxide emissions Aluminum - mining for metals, slag ponds and heavy metal pollution	Use of fuel: Carbon fuel sources contribute to climate change	Collecting, sorting, storing Recycling is no longer available in North America so used Tetra Paks are shipped to China for processing Fuel for shipping contributes to climate change	Tetra Paks are recycled through something called the hydropulping process Special equipment is required to recycle it Large amounts of water and energy are used to separate the layers Only the paper in Tetra Paks is recycled. The aluminum and wax become landfill waste