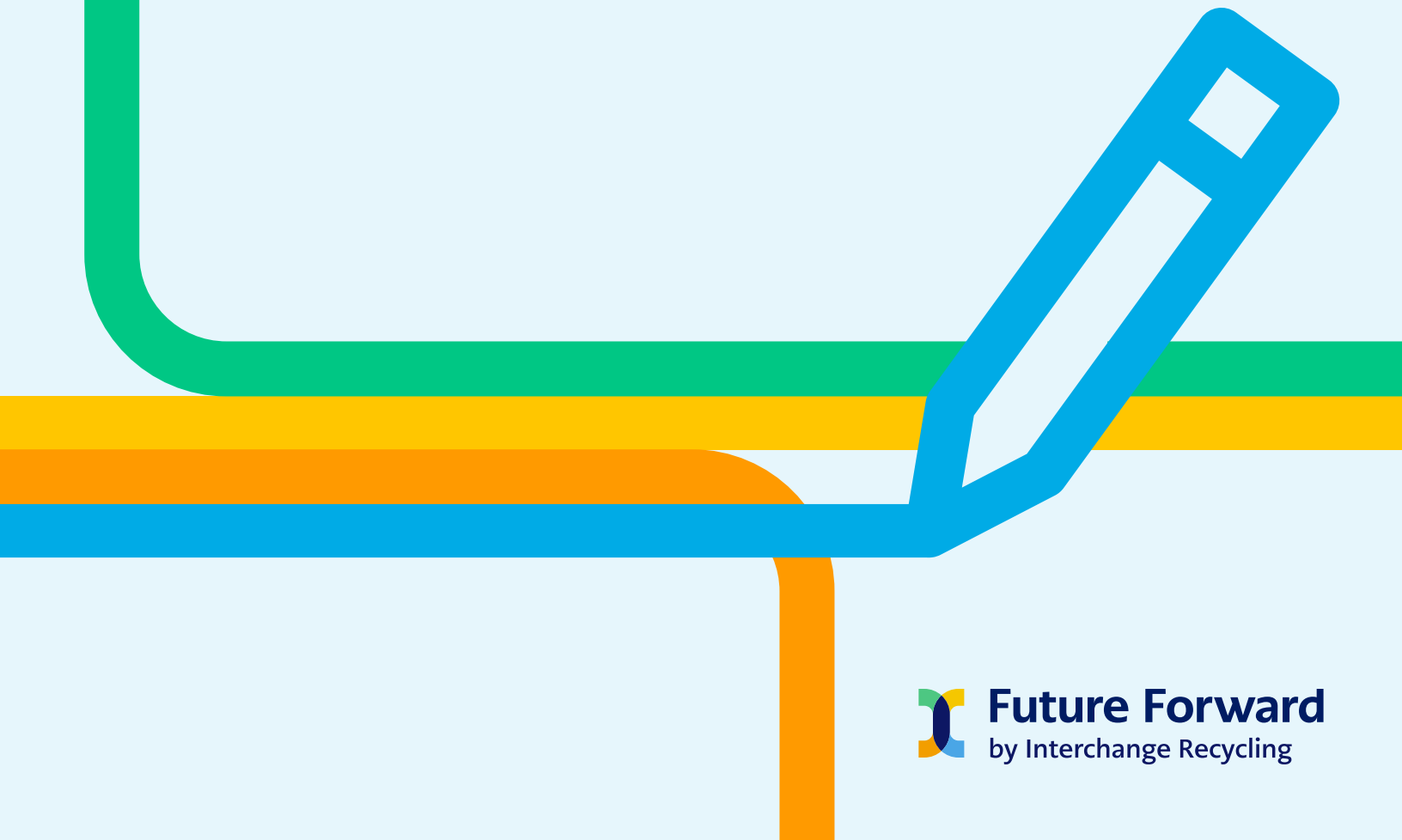
Safe and Sustainable

Teaching hazardous waste recycling with Interchange Recycling



Future Forward
by Interchange Recycling

Table of Contents

03 Introduction
05 Curriculum Connections
06 The Why
15 The What
19 The How
21 The Where

Introduction

Welcome to the Interchange Recycling Teacher Resource Guide, designed to support educators in integrating recycling practices into Applied Design, Skills, and Technologies (ADST) programs.

What's Interchange Recycling all about?

We're a not-for-profit, producer-governed group that sustains the environmental objectives of our members.

Interchange Recycling manages the collection and recycling of motor oil and antifreeze products that our members make and sell, which are then made available as new products by our members and other vendors. Ultimately, our mandate is to provide an eco-friendly and cost-effective way to recycle used motor oil, oil filters, oil containers, antifreeze, and antifreeze containers—and we're always examining new automotive and industrial products to bring into our recycling process.

Introduction

Why a teacher resource?

Our recent research shows that 18% of DIY users under the age of 25 reported disposing of oil improperly. We want to change this and learning about stewardship while acquiring mechanical skills is a great place to start.

Interchange Recycling is dedicated to fostering environmental stewardship and sustainability by ensuring that program materials are recycled efficiently and safely, minimizing their impact on the environment.

For students today, understanding the importance of recycling and how to actively participate in sustainable practices is more critical than ever. Young people are the future leaders, designers, and innovators. By engaging in recycling efforts, they not only help reduce waste and conserve natural resources but also contribute to the development of a circular economy—an economic system where materials are reused, repaired, and recycled rather than discarded.

This guide provides teachers with tools, resources, videos, and student activities to help students recognize the importance of responsible product disposal, understand the processes behind recycling, and participate in Interchange programs.

By incorporating these principles into your teaching, you can empower students with practical skills that promote sustainability and environmental responsibility, helping them become informed and active participants in creating a more sustainable future. This curriculum-connected resource can be used in its entirety as a full inquiry unit or be shared in smaller pieces in real time as students approach mechanical projects of their own.

Together, let's inspire change and cultivate a culture of recycling, making a lasting impact on both the environment and the student's lives.

This resource was written for Interchange Recycling by Christina (Tina) Willard-Stepan, B.Ed. and Maya Willard-Stepan, B.Sc., M.Sc.
www.pollinatecommunity.ca

Curriculum Connections

Big Ideas

Vehicle operation, service, and maintenance include consideration of social and environmental impacts including operator and public safety; emissions and effects on the environment; manufacturing, packaging, disposal, and recycling considerations related to vehicle parts and products.

Applied Design

- Critically analyze how competing social, ethical, and sustainability considerations impact creation and development of solutions
- Evaluate suitability of plans, products and processes according to intended impact of service
- Analyze the design for the product's life cycle and evaluate its impacts
- Consider a variety of materials for effective use and their potential for reuse, recycling, and biodegradability
- Make changes to tools, materials, and procedures as needed
- Identify appropriate tools, technologies, materials, processes, and time needed
- Use materials in ways that minimize waste

Applied Skills

- Apply safety procedures for themselves, co-workers, and operators in both physical and digital environments
- Develop specific plans to learn or refine identified skills over time

Applied Technologies

- Explore existing, new, and emerging tools, technologies, and systems to evaluate suitability for automotive maintenance and repair interests
- Evaluate impacts, including unintended negative consequences, of choices made about technology use
- Analyze how advancing technologies affect automotive contexts

The why

Share the following handout with your students for them to self-study why recycling hazardous waste is important. Want to test if they've got it? Try an **Interchange Recycling Kahoot Quiz**, or the pen-and paper quiz that follows the handout.

Answer key to pen-and-paper quiz:
1:B 2:C 3:B 4:A 5:B 6:C 7:B 8:B 9:B 10:D 11:A 12:B

Why recycle it?

Whether it's in class, your hobbies, or even a future career, you play a crucial role in protecting our environment. Recycling used motor oil and antifreeze is a simple yet powerful way to safeguard the natural world we all love to explore.

So, why recycle used motor oil and antifreeze?

Protecting waterways and natural habitats

Imagine your favourite fishing, hunting, hiking, boating, or camping spot contaminated by improperly disposed motor oil or antifreeze. Just one litre of oil can pollute up to one million litres of water, threatening aquatic life, our own drinking water, and the entire ecosystem. How would that impact your experience? When you recycle these fluids, you are directly contributing to the preservation of pristine waterways and the diverse habitats they support.

Conserving natural habitats

Recycling used motor oil isn't just about preventing pollution—it's about making the most of our resources. Did you know that recycling oil requires only about one-third of the energy needed to refine new crude oil? This process significantly reduces the demand for new oil extraction, helping to preserve natural areas that might otherwise be disrupted by drilling activities. Used motor oil is one of the only non-renewable energy resources that can be reused over and over again.

Why recycle it?

Value recovery from waste products

Instead of being discarded, used oil and antifreeze become valuable resources:

Used oil can be re-refined into new lubricating oil or transformed into inputs for manufacturing or energy products.

Used antifreeze is refined and reused as new automotive antifreeze.

Oil filters contain recyclable metal that can be used to manufacture products like rebar, nails, and wire.

Plastic containers from oil and antifreeze are recycled into new products such as oil containers, drainage tiles, and parking curbs.

Reducing greenhouse gas emissions

By choosing to recycle, you're taking a stand against climate change. The re-refining process for used motor oil produces fewer greenhouse gas emissions compared to refining crude oil. This means that every time you recycle your used oil, you're helping to reduce the carbon footprint of the automotive industry.

Even by simply gaining the repair skill that you are learning in class, you are participating in the circular economy of reduce, reuse, recycle, and repair.

As future stewards of our environment, your actions today will shape the world of tomorrow. By understanding and participating in the recycling of motor oil and antifreeze, you're not just completing a school project—you're taking concrete steps to protect the natural world. Whether you're planning your next fishing trip or preparing for hiking, camping or hunting season, remember that your commitment to recycling these automotive fluids plays a vital role in keeping our wilderness areas clean, healthy, and thriving for generations to come.

Why recycle it?

Creating a circular economy

Recycling motor oil and antifreeze isn't just about disposal—it's about transformation. These materials can be refined and reused multiple times, creating a circular economy that reduces waste and conserves resources. For example, used antifreeze can be refined and reused as new automotive antifreeze, while used oil can be re-refined into new lubricating oil or used as input for manufacturing or energy products.

Why recycle it? Quiz

1. Why is recycling used motor oil and antifreeze important?

A) It's fun
B) It helps protect the environment
C) It costs less
D) It's required by law

2. How much water can 1 litre of motor oil pollute?

A) 100 litres
B) 10,000 litres
C) 1,000,000 litres
D) 100,000 litres

3. What are some places that could be harmed by improperly disposed motor oil or antifreeze?

A) Highways
B) Fishing, hunting, or hiking spots
C) School playgrounds
D) Shopping malls

4. What is a benefit of recycling used motor oil?

A) Requires less energy than refining new crude oil
B) Costs more money to recycle
C) Prevents water contamination only
D) Reduces the number of cars on the road

5. What happens to used antifreeze when it's recycled?

A) It's thrown away
B) It's refined and reused as new antifreeze
C) It's turned into drinking water
D) It's used to power homes

6. What recyclable materials can be found in oil filters?

A) Glass
B) Plastic
C) Metal
D) Rubber

7. Which of the following is a product made from recycled oil containers?

A) Clothes
B) Drainage tiles
C) Wooden beams
D) Shoes

8. How does recycling used motor oil help reduce greenhouse gas emissions?

A) It eliminates cars
B) Re-refining oil produces fewer emissions than refining crude oil
C) It helps plants grow faster
D) It prevents global warming

Why recycle it? Quiz

9. What does it mean to create a "circular economy" with motor oil and antifreeze?

A) Using them once and discarding them
B) Refining and reusing them multiple times
C) Making them circular in shape
D) Banning the use of oil and antifreeze

10. Which of the following is NOT a product made from recycled oil or antifreeze?

A) Rebar
B) Nails
C) Parking curbs
D) Food containers

11. What personal actions help contribute to a circular economy?

A) Reducing, reusing, recycling, and repairing
B) Only using new products
C) Disposing of everything in a landfill
D) Avoiding the use of oil and antifreeze

12. How can you help protect natural areas like your favourite camping or hiking spot?

A) Burn used oil
B) Properly recycle motor oil and antifreeze
C) Dump oil in the grass
D) Avoid recycling entirely

Activity

Circular economy challenge: redesigning for sustainability

Learning Objective

Students will understand the concept of a circular economy.

Introduction

Begin with a brief discussion about waste and resource consumption. Ask students:

• What happens to products when we're done using them?

• What would happen if used oil and antifreeze were to be disposed of down the drain or elsewhere?

• Where do the materials for new oil products come from?

• Show video:
Interchange - Our Role in Circular Economy

Introduce the concept of a circular economy as an alternative to the traditional linear "take-make-dispose" model. Reinforce that simply by learning the skills in the automotive program; they are participating in circular economy through repair.

Activity

1. Divide the class into small groups.

2. Give each group a shuffled set of dark blue cards (following page) representing stages in a product's lifecycle. (e.g. raw material extraction, manufacturing, use, disposal).

3. Have groups arrange the cards in linear economy model.

4. Next, challenge them to rearrange the cards into a circular economy model by introducing the green cards (e.g. repair, reuse, recycle).

5. Discuss the differences between the two models and their environmental impacts.

Reflection

Ask students to write a brief reflection on:

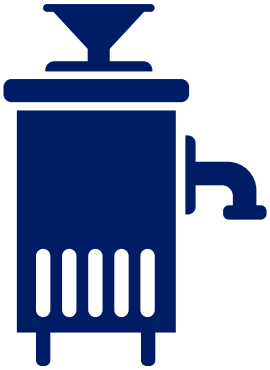
• How the circular economy concept changes their view of consumption and waste

• Challenges they foresee in implementing circular economy principles

• One action they can take in their daily lives to support a circular economy

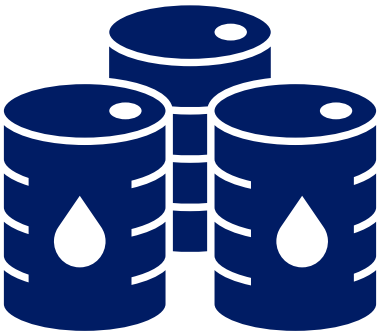
Raw material extraction

Material processing



Manufacturing

Packaging



Distribution

Consumer use

Disposal

Landfill

Incineration

Sustainable sourcing

Green manufacturing

Efficient distribution

Take-back programs

Distribution

Consumer use

Material recovery

Remanufacturing

Waste-to-resource

The what

Activity

Accepted materials scavenger hunt

Learning objective

Students explore the range of materials accepted by Interchange Recycling and understand how automotive-related products can be responsibly recycled, promoting environmental stewardship in automotive practices.

Introduction

Recycling automotive materials is a critical part of reducing environmental impact and promoting sustainability. Start by sharing the video **Meet Interchange Recycling** to introduce students to the organization and its role in recycling automotive products. Afterward, students will embark on a scavenger hunt using the Interchange Recycling website to identify which automotive and related materials are accepted by their program.

Activity

Provide students with the handout you can find on the following page. Send students to the **Interchange Website** for a 'Scavenger Hunt' to check off which products are accepted by the Interchange Recycling Program.

Accepted materials scavenger hunt

Explore **interchangerecycling.com** and check off which products are accepted by the Interchange Recycling Program.

- ☐ crankcase oil (petroleum or synthetic)
- ☐ crankcase oil (petroleum or synthetic)
- ☐ windscreen washer fluid
- ☐ anti-seize lubricant
- ☐ drawing, stamping, and shaping oil
- ☐ air filter
- ☐ polyglycol synthetic compressor oil
- ☐ export oil sales
- ☐ oil additive
- ☐ oil / air separator filter
- ☐ compressor oil
- ☐ brake fluid
- ☐ synthetic aromatic hydrocarbon
- ☐ heat transfer fluid
- ☐ vegetable oil for lubrication (not cooking oil)
- ☐ plastic/paper element style filter
- ☐ lock de-icing fluid
- ☐ oil treatment
- ☐ plastic/paper element style filter
- ☐ gasoline/2-cycle engine oil mixes
- ☐ pneumatic system oil
- ☐ hydraulic fluid
- ☐ rock drill oil
- ☐ phosphate ester hydraulic fluid
- ☐ dripless lube
- ☐ coolant filter
- ☐ propylene glycol heat transfer fluid
- ☐ process oil
- ☐ textile oil
- ☐ aerosol-propelled lubricant grease
- ☐ quenching oil
- ☐ ethylene glycol heat transfer fluid
- ☐ marine engine oil for vessels operating domestically
- ☐ ethylene glycol engine coolant
- ☐ paper machine oil

Accepted materials scavenger hunt

Explore **interchangerecycling.com** and check off which products are accepted by the Interchange Recycling Program.

- ☐ spin-on or element style filter used in hydraulic, transmission, or internal combustion engine applications, including diesel fuel filter
- ☐ fuel line de-icing fluid
- ☐ compressor oil
- ☐ food grade white mineral oil
- ☐ drawing oil
- ☐ gun oil
- ☐ marine cylinder oil
- ☐ natural gas compressor oil consumed in use
- ☐ household furnace air filter
- ☐ turbine oil
- ☐ silicone lubricant
- ☐ kerosene
- ☐ wiring pulling lubricant (petroleum or vegetable-based)
- ☐ conveyor lube
- ☐ saw guide oil
- ☐ heating furnace oil
- ☐ base oil, including re-refined base oil
- ☐ natural gas compressor oil not consumed in use
- ☐ diesel fuel filter used at retail and commercial pump islands
- ☐ cooking oil
- ☐ brake fluid
- ☐ transmission fluid
- ☐ urethane coating
- ☐ wax
- ☐ coolant filter
- ☐ mineral heat transfer fluid
- ☐ export oil sales
- ☐ vegetable oil for lubrication
- ☐ DEF fuel filter
- ☐ diesel fuel treatment
- ☐ chain oil
- ☐ oil additive

The how

Presentation

Learning objective

Students will gain an understanding of the Interchange Recycling program scope, processes, and impacts, as well as the environmental and economic benefits of recycling used oil and antifreeze in British Columbia.

Introduction

Recycling used oil and antifreeze is a vital part of protecting BC's environment and the conserving of resources. This presentation introduces students to the Interchange Recycling program, highlighting the materials it manages, how the recycling process works, and the benefits of participation. Teachers can download the accompanying PowerPoint from the Interchange website, complete with videos and visuals to enhance student engagement and learning.

Activity

Present the **PowerPoint presentation** made available on the Interchange Website.

The where

Activity

Wherever you live

Learning objective

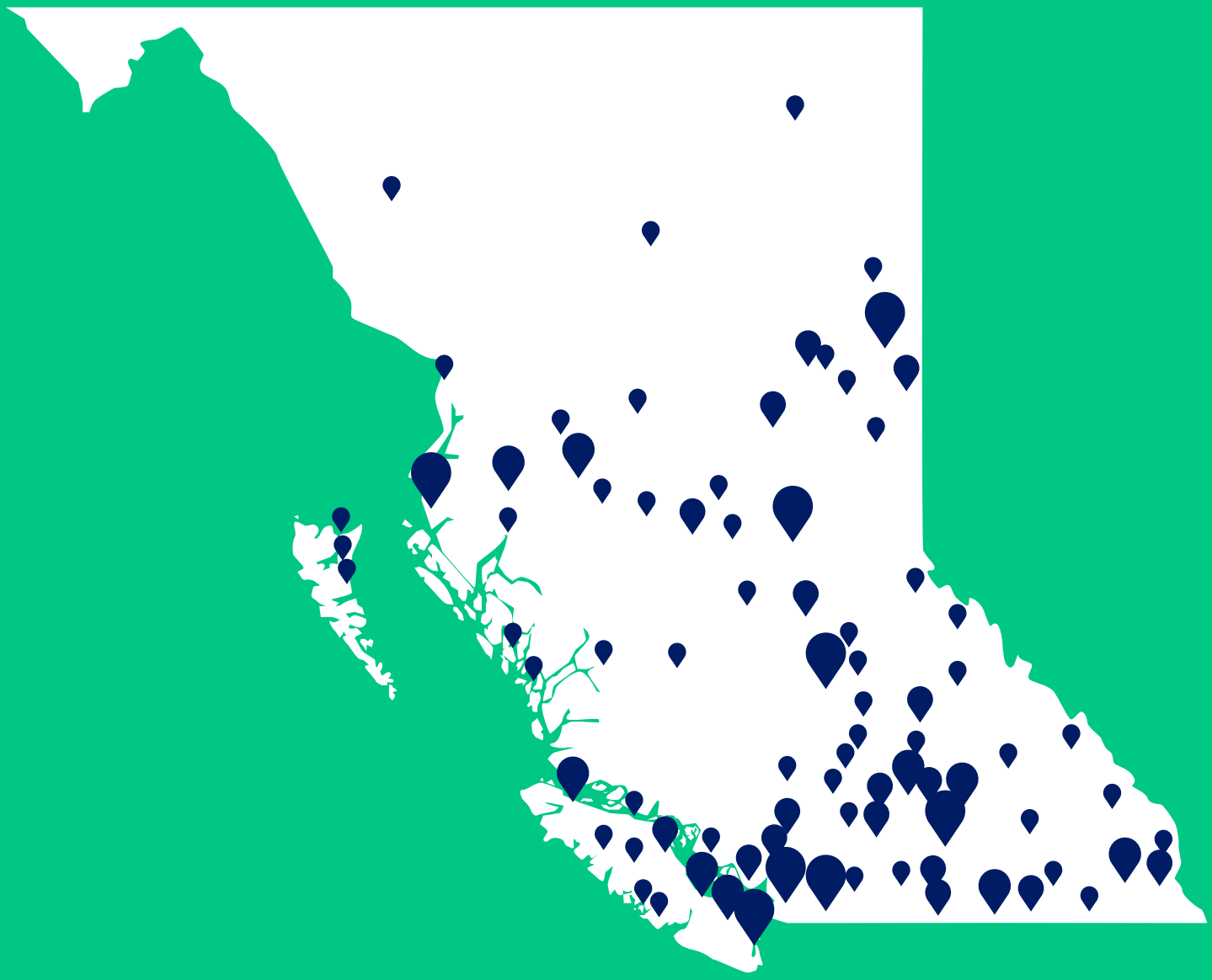
Students will explore the accessibility of recycling centres across British Columbia and develop an understanding of the importance of proper disposal of automotive waste, even when traveling or working in remote locations.

Introduction

Recycling used oil and antifreeze isn't just for your local community— it's important wherever you are in British Columbia. Begin by sharing the ***Wherever You Live* infographic** and a map of BC recycling centres to illustrate the program's reach. Students will share their favorite vacation spots in BC and use the provided map tool to locate the nearest recycling centre where they could responsibly recycle automotive materials if needed.

Activity

Have Students share their favourite vacation spot in British Columbia. Have them track **in the map** which Recycling Centre would be closest if they were to do mechanical work there.



Wherever you live, Interchange is nearby.

Interchange
Recycling

interchangerecycling.com

info@interchangerecycling.com