Lesson #12
Ride, Roll and Stroll

Students dream up creative ways to get to school, dance lessons, hockey practice or a friend's place. After analyzing the pros and cons of their wild rides, students consider the more usual modes of transportation available to them and assess the environmental impacts of each. Empowered with new knowledge, students revise their initial designs and embellish them with selling points so that they can attract others to their mode of transportation via video, poster or audio advertisement.

Subject Areas
Mathematics, Social Studies, Physical Education

Student Skills
Estimating, critical thinking, reflecting, communicating a message

Developing Vocabulary
Car-centered, climate change, carbon dioxide, emissions, greenhouse gases, neutral, rush hour, transit, travel mode, walking oriented

RELATED BACKGROUNDERS

Energy Needs

Energy and the Environment

Learning Objectives

- to gather, evaluate and select modes of transportation based on their own experience and compare with available data
- to assess and determine solutions for local transportation challenges

Materials You Need

- Transportation Use Chart (handout), included at the end of this lesson plan
- Data & Facts About Transportation Use (handout), included at the end of this lesson plan
- props for skits, paper/overhead for recording information

> "Converting calories into gas, a bicycle gets the equivalent of three thousand miles per gallon."
>
> — Bill Strickland, *The Quotable Cyclist*

Time Estimate	Lead In	Main Activity	Wrap Up
3 HOURS	***15*** *minutes*	***145*** *minutes*	***20*** *minutes*

Teacher Tip

Part C of the Main Activity requires use of the computer lab. Estimate the best date for this activity and then book the lab in advance.

What You Do

Lead In

Lead In

***15** minutes*

1. In small groups, ask students to brainstorm their ideas: *If you could travel to school in any way you want, how would you travel? Why choose this method?* Encourage students to think outside the box. At this point, anything goes.
2. With the whole class, share and list all of the methods proposed. Once listed, discuss the feasibility—the specific pros and cons—of each method.
3. Tell students they will consider how they currently travel to and from school and then compare and contrast these methods with their creative ideas.

Main Activity

Main Activity

***145** minutes*

PART A—60 minutes

4. Provide students with a copy of the Transportation Use Chart provided at the end of this lesson. In groups of three, have students complete the chart. A short refresher on fractions might help. You might also want to suggest a common denominator such as 5 or 10 for all students. If your students are familiar with percentages, you may prefer to have them use percentages. To complete the chart:
   - Students estimate their own individual use of each mode of travel and enter it as a fraction (unless you have opted to work with percentages).
   - Students provide three descriptor words—adjectives and adverbs—that they would apply to each mode, such as *fast, smart, dangerous*.
   - Students estimate the fraction for each mode of transportation they think applies to the entire class and enter this number in the left-hand column.
5. As you circulate around the room, take note what each student has recorded as their individual use so that while the groups are working on the next two columns, you can calculate a rough class average for each mode of transportation. If your class is familiar with calculating averages, you may want to do this calculation as a class, as mentioned in step 8 below.
6. Invite groups to share and record their estimates for the whole class to see. As a class, determine:
   - Which mode of transportation has the highest or lowest estimates?
   - Which mode has the largest range of answers? You might want to take a moment to review the concept of *range*.
   - What descriptor words were most common for each mode?

What You Do

Main Activity (continued)

7. Share your calculations for the class average use for each mode of transportation. Depending on the grade level of your students, you could work as a class to calculate the class average use of each mode of transportation rather than provide these calculations for them.
8. Ask students to consider:
   - How close were your estimates of the average classroom use to your own actual use?
   - Which mode is most commonly used by this class?
   - What surprises you most about these results?
   - How might our actual use of these modes of transportation be more accurately measured?
9. Hand out Data & Facts About Transportation Use, which is provided at the end of this lesson. Looking at the two charts together as a class, discuss the differences and similarities between the students and other Canadian commuters.

PART B—45 minutes

10. In small groups, have students prepare short skits to act out peculiar or unlikely transportation scenarios that focus on a specific mode of transportation.
    - Driving to the library 1 km away.
    - Walking to pick up a treat 10 km away.
    - Taking transit to the movie theatre 2 km away.
    - Cycling to a sports practice 8 km away.

    Explain that the groups need to present persuasive arguments and facts within the skit to elaborate why a particular mode is the best choice for the scenario. Assign a scenario to each group and give the groups five minutes to rally as many arguments/facts as possible and then present them in a short skit to the class in one minute or less.
11. Discuss the variables that emerged during the presentations and ask students to consider the following questions.
    - What reasoning do you think best explains why certain modes are used in particular situations (e.g., student age, bus routes, parental control, convenience, or safety issues)?
    - What connections do you see between these reasons and some of the descriptor words you used for different modes of transportation in the Transportation Use Chart?
    - How do your insights here compare with your creative ideas at the outset?

What You Do

Main Activity (continued)

PART C—40 minutes

12. Before exploring the impacts of their transportation choices, review some facts on the Data & Facts About Transportation Use handout about the travel patterns of North Americans. Ask students to share their responses to these facts.
13. In the computer lab, show students how to use the Travel Calculator to measure the greenhouse gas emissions related to their travel to and from school. To access the calculator, visit HASTE, Hub for Action on School Transportation Emissions, at www.hastebc.org/mytravel. Let students use the Calculator to explore alternative modes of transportation that they could use if they wanted to reduce their emissions.

Wrap Up

Wrap Up

***20** minutes*

14. Ask students to write a scenario that relates to them personally which builds an environmental case for adopting a change to their usual pattern of travel. Encourage students to make use of some of the points that were made during the presentations (you could post them as a list). You may wish to have students focus on particular barriers they see, ways to overcome them, and the benefits of making such a change.

Adaptations & Extensions

- **Expand the eLearning component.** Invite students to use the travel planning resource at www.hastebc.org/routeplanner. Alternatively, using a large map of your town or city, let students use string to map their routes to school using the scale (review ratios and scales beforehand) and calculate their average distance to school. If you use coloured pushpins for the different modes of travel, your map could vividly illustrate how the class travels.
- **Continue the explorations.** Go beyond environment and transportation concerns directly to explore health, fun, freedom and mobility. Explore the case studies *Improving Neighbourhoods*, *Fort Street Revival* and *The Bogota Project*. Investigate how walkable and bikeable the school and nearby neighbourhoods are and engage in school-based travel planning. The Otesha project offers great information on transportation: http://www.otesha.ca/otesha+book/index.en.html.
- **Plan a bike-a-thon.** Organize a school bike-a-thon and see how transportation changes lives. Visit http://www.saferoutestoschool.ca/partnership/ to find a regional resource group to support your bike-a-thon.
- **Conduct a life-cycle study.** Have students in groups explore the four modes of transportation as a life-cycle study. For each mode, trace back to the resources used to manufacture the item (car, bike, shoes, bus), how long or the number of kilometres the item is expected to last, the impact the item will have on the environment while in use, and the impacts of disposal when the item is no longer in use.
- **Introduce theatre games.** Using invented or created scenarios—such as at the bus stop, bike rack, pedestrian crosswalk, mayor's office—students create a storyline of their experience. Their scenarios are selected to show the challenges of transportation and unhappy outcomes. The skits are then re-enacted, this time with other students choosing to take the place of the actors and play the scenes in a different way for a more productive and positive outcome. Students may find inspiration in resources such as Bill Strickland's *The Quotable Cyclist* or *Divorce Your Car* by Katherine Alvord.
- **Bring in a role model.** Bring in an outside expert to inspire students and further their thinking about sustainable transportation:
  - bike education groups
  - groups dedicated to improving air quality by reducing emissions, such as Clean Air Champions www.cleanairchampions.ca
  - city planners who can discuss ideas and plans that students can help support.

Assessment Rubric

These criteria can be expanded or adapted to emphasize different aspects of the lesson. You can use the rubric to help students self-assess their participation and experience, and then pose follow-up questions to the class encouraging them to reflect further on their challenges and insights.

Thinking	**1**	**2**	**3**	**4**
Read, represent, compare and order whole numbers up to 100,000, decimal numbers to hundredths, proper and improper fractions, and mixed numbers.	Uses processing skills with limited effectiveness	Uses processing skills with some effectiveness	Uses processing skills with considerable effectiveness	Uses processing skills with a high degree of effectiveness
Communication	**1**	**2**	**3**	**4**
Identify their point of view and other possible points of view, and determine, when appropriate, if their own view is balanced and supported by evidence.	Communicates to different audiences and purposes with limited effectiveness	Communicates to different audiences and purposes with some effectiveness	Communicates to different audiences and purposes with considerable effectiveness	Communicates to different audiences and purposes with a high degree of effectiveness
Application	**1**	**2**	**3**	**4**
Apply the creative process to process drama and the development of drama works, using the elements and conventions of drama to communicate feelings, ideas, and stories.	Applies knowledge and skills in familiar contexts with limited effectiveness	Applies knowledge and skills in familiar contexts with some effectiveness	Applies knowledge and skills in familiar contexts with considerable effectiveness	Applies knowledge and skills in familiar contexts with a high degree of effectiveness

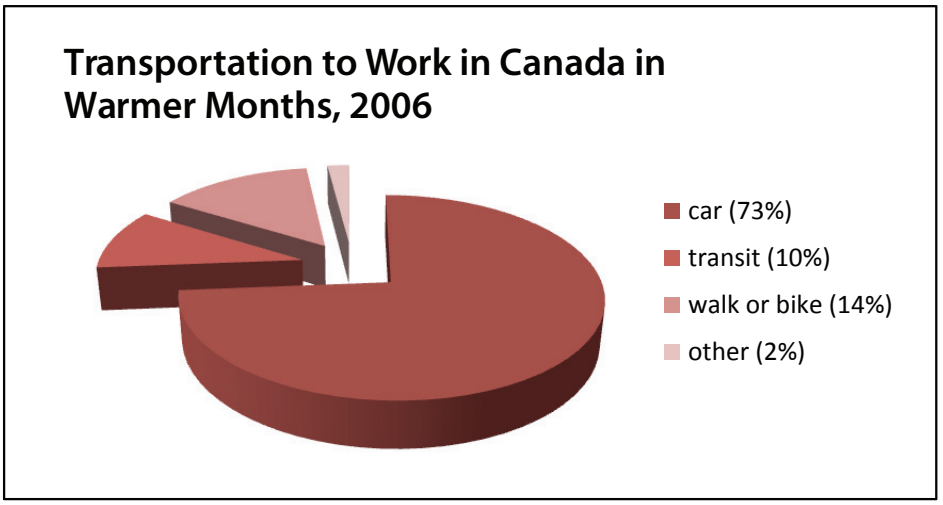
Transportation Use Chart

My mode of transportation to and from school	Fraction of my use*	Three descriptor words for this mode of transportation	Fraction of the class' use*
Ride a Bicycle		1. 2. 3.	
Travel by Bus		1. 2. 3.	
Walk		1. 2. 3.	
Travel by Car or Van		1. 2. 3.	

* For example, you may ride a bike ⅖ of the time—about two days in every five, or for about four full months during the school year—but you may think that the class as a whole rides less often, such as ⅕.

Data & Facts About Transportation Use

Data source: Statistics Canada, Canadian Vehicle Survey: Annual, 2006.



Data source: Statistics Canada, Canadian Vehicle Survey: Annual, 2006.

Preferred Mode of Canadian Commuters

In a survey, Canadians were asked how they felt about their modes of transportation to work. These fractions represent how many Canadians said they **liked** a mode of travel.

Bicycle:	11/20
Walk:	12/20
Car:	8/20
Transit:	5/20
Car + Transit:	4/20

Data source: SB Bicycle Coalition, based on Statistics Canada General Social Survey, 2005

Facts About Transportation

- A single public bus takes 40 vehicles off the road during rush hour, saves 70,000 litres of fuel, and reduces air pollution by nine tonnes each year.
- A typical SUV uses almost twice the fuel and releases nearly twice the emissions of a modern station wagon, although both seat the same number of passengers.
- About 3/4 of Canadians agree that physical exercise helps reduce stress and risk of heart disease.
- Each year, the average Canadian makes 2,000 car trips for distances of less than 3 km.
- In many parts of Canada, car sharing may be among the most promising and cost-effective way to reduce vehicle use.
- Motor vehicles produce more air pollution than any other single human activity.
- On average, someone who takes the bus to work every day instead of driving keeps 800 pounds of carbon dioxide out of the air each year.
- The air we breathe inside our cars can be up to 10 times more polluted than the air outside!
- The average person spends 32 hours a month driving and 27 hours a month working to pay just for the use of their car!
- Transportation of freight and people make up 1/4 of Canada's greenhouse gas emissions
- Victoria, British Columbia, raised its bicycle use rate by 33% over the past 8 years. Cycling makes up 3.2% of weekday regional travel mode.
- Walking-oriented European cities devote less than 10% of their land to transportation, while automobile-oriented North American cities devote as much as 50% of their land to roads and off-street parking.